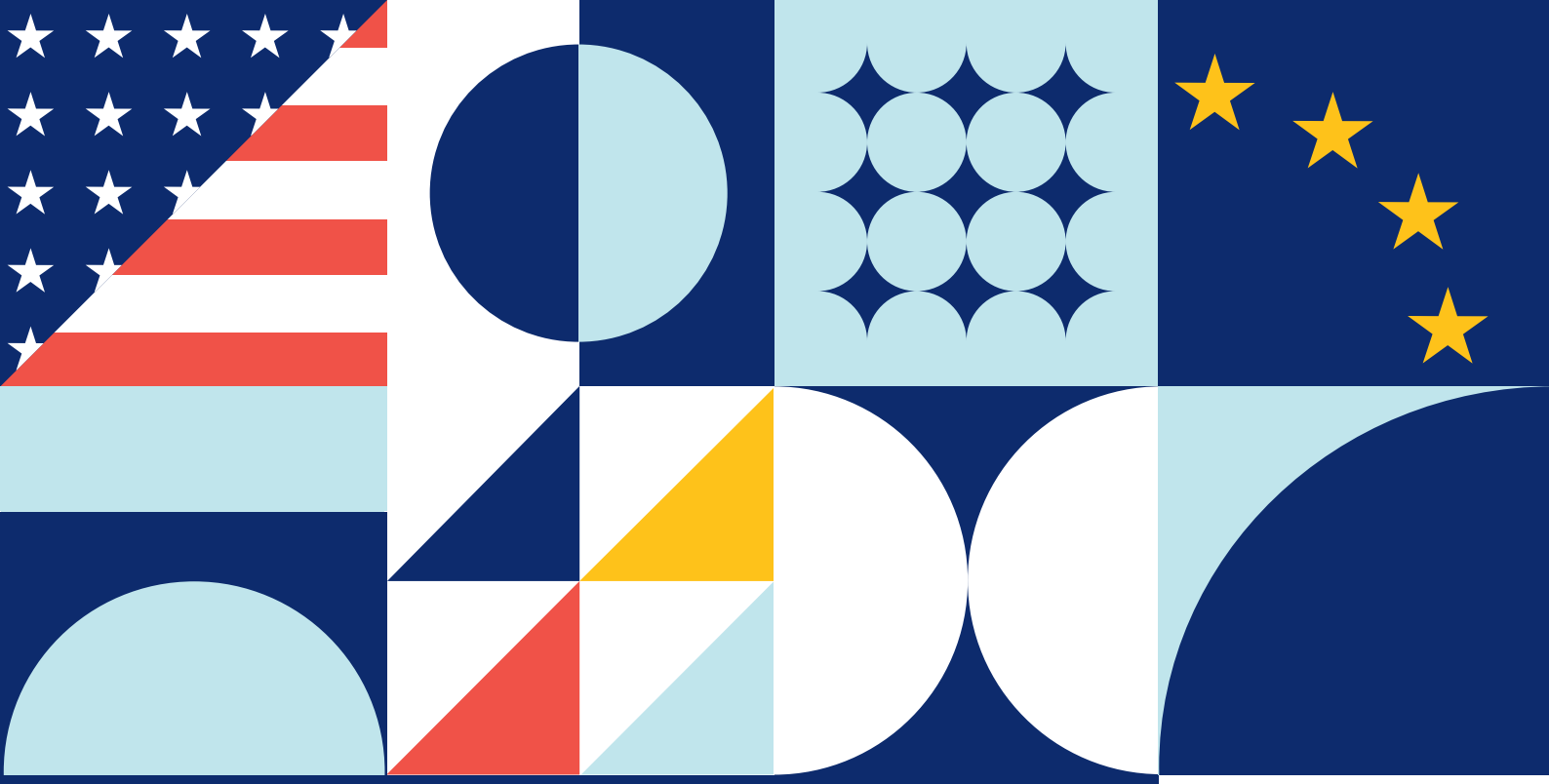

THE TRANSATLANTIC ECONOMY 2023

Annual Survey of Jobs, Trade and Investment between the United States and Europe

Daniel S. Hamilton and Joseph P. Quinlan

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Hamilton, Daniel S., and Quinlan, Joseph P., *The Transatlantic Economy 2023: Annual Survey of Jobs, Trade and Investment between the United States and Europe*. Washington, DC: Foreign Policy Institute, Johns Hopkins University SAIS/Transatlantic Leadership Network, 2023.

Distributed by Eurospan, Gray's Inn House, 127 Clerkenwell Road, London EC1R 5DB, www.eurospan.co.uk.

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ISBN 978-1-7370491-3-5

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20th Anniversary Edition

Daniel S. Hamilton and Joseph P. Quinlan

Paul H. Nitze School of Advanced International Studies,
Johns Hopkins University

Transatlantic Leadership Network

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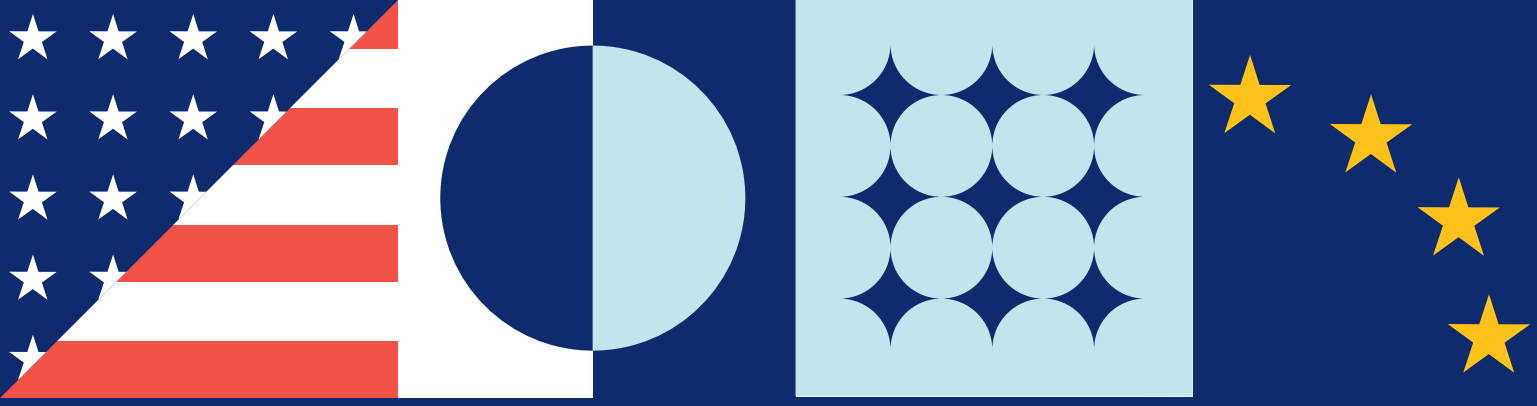


THE TRANSATLANTIC ECONOMY 2023

The $7.1 trillion transatlantic economy is proving to be remarkably resilient in the face of global economic and strategic disruptions. The U.S. and Europe remain each other's most important markets and geo-economic base. No two other regions in the world are as deeply integrated as the U.S. and Europe.

16 million jobs
on both sides of the Atlantic

$5.9 trillion
in total commercial sales a year

Half of total
global personal consumption

One third of global GDP
(in terms of purchasing power)

Digital

+50% of digitally-enabled services between the U.S. and the EU are used to produce export products on each side

55% more data flows via transatlantic cables than over transpacific routes

Energy

2.5 times more LNG supplies from the U.S. to Europe than in 2021 (2022)

+50% long-term renewable energy purchase agreements in Europe with U.S. companies

Investment

64% of global investment into the U.S. comes from Europe (2021)

61% of U.S. global investment goes to Europe (2021)

Innovation

R&D spending

$31.6 billion U.S. affiliate R&D in Europe (2020)

$47.8 billion European affiliate R&D in the U.S. (2020)

Trade in goods

$1.2 trillion U.S.-Europe goods trade (2022)

$909.5 billion U.S.-EU goods trade (2022)

Jobs

Workers

5 million U.S. employees of European companies (direct jobs due to investment, 2021 estimate)

4.8 million European employees of U.S. companies (direct jobs due to investment, 2021 estimate)

Trade in services

$332 billion U.S. to Europe (2021)

$230 billion Europe to the U.S. (2021)

Preface and Acknowledgements

Daniel S. Hamilton

Joseph P. Quinlan

We are pleased to present the 20th edition of our annual review of the dense economic relationship binding European countries to America's 50 states. This year, we offer a special section on international support for Ukraine. We have also added Ukraine to the European countries we survey in terms of U.S.-related jobs, trade and investment. We also look at the impact of international sanctions on Russia.

The survey consists of seven additional chapters. Chapter One underscores the remarkable resilience of the transatlantic economy in the face of surprises and shocks, from Russia's war on Ukraine and the Covid-19 pandemic to congested supply chains and inflationary pressures. Chapter Two updates our basic framework for understanding the deeply integrated transatlantic economy via "eight ties that bind." Chapter Three discusses shifting U.S. and European commercial relations and dependencies on Russia, China, and the evolution of transatlantic and global supply chains. We have added a new Chapter Four, which looks at three major shifts that are transforming the transatlantic energy economy. Chapter Five explores the transatlantic digital economy, which in many ways has become the backbone of commercial connections across the Atlantic. Chapter Six offers an overview of European commercial ties with the United States, and Chapter Seven an overview of U.S. commercial relations with Europe. The appended charts provide the most up-to-date information on European-sourced jobs, trade and investment with the 50 U.S. states, and U.S.-sourced jobs, trade and investment with the 27 member states of the European Union, as well as Norway, Switzerland, Türkiye, Ukraine and the United Kingdom.

This annual survey complements our other writings in which we use both geographic and sectoral lenses to examine the deep integration of the transatlantic economy, and the role of the U.S. and Europe in the global economy, with particular focus on how globalization affects American and European consumers, workers, companies, and governments.

In this 20th anniversary year, we would like to thank the many individuals who have helped us over many seasons. We are grateful for generous support of our annual survey from the American Chamber of Commerce to the European Union (AmCham EU), the U.S. Chamber of Commerce and their member companies, as well as the American Chambers of Commerce in Denmark, Finland, Greece, Ireland, Italy, Luxembourg, Romania and Sweden. We are thankful for the assistance of Laura Escobar Diaz, Thibaut L'Ortye, Wendy Lopes, Garrett Workman and Ivana Zuzul in producing this study.

The views expressed here are our own, and do not necessarily represent those of any sponsor or institution. Other views and data sources have been cited, and are appreciated.

Daniel S. Hamilton
Joseph P. Quinlan

Executive Summary

- The transatlantic economy is proving to be remarkably resilient in the face of global economic and strategic disruptions. The U.S. and Europe remain each other's most important markets and geo-economic base. The $7.1 trillion transatlantic economy employs 16 million workers in mutually "onshored" jobs on both sides of the Atlantic. It is the largest and wealthiest market in the world, accounting for half of total global personal consumption and close to one-third of world GDP in terms of purchasing power.

- Ties are particular thick in foreign direct investment (FDI), portfolio investment, banking claims, trade and affiliate sales in goods and services, digital links, energy, mutual R&D investment, patent cooperation, technology flows, and sales of knowledge-intensive services.

- 2022 was record-breaking on multiple fronts:
  - U.S.-Europe trade in goods reached an all-time high of $1.2 trillion.
  - U.S.-EU goods trade hit a record $909.5 billion, more than EU-China goods trade and 25% higher than U.S.-China goods trade.
  - U.S. company affiliates in Europe earned an estimated $325 billion, a record high, while European affiliates in the U.S. earned $151 billion, the second highest level ever.
  - U.S. exports of liquefied natural gas (LNG) to Europe hit their highest levels ever. The U.S. accounted for more than half of Europe's LNG imports, and Europe accounted for more than half of U.S. LNG exports to the world.

Transatlantic Investment: Still Driving the Transatlantic Economy

- Trade alone is a misleading benchmark of international commerce; mutual investment dwarfs trade and is the real backbone of the transatlantic economy. The U.S. and Europe are each other's primary source and destination for foreign direct investment.

- U.S. and European goods exports to the world (excluding intra-EU trade) accounted for 20% of global exports in 2021. But together they accounted for 66% of the outward stock and 66% of the inward stock of global FDI. Moreover, each partner has built up the great majority of that stock in the other economy. Mutual investment in the North Atlantic space is very large, dwarfs trade, and has become essential to U.S. and European jobs and prosperity.

- Combined output of U.S. foreign affiliates in Europe (est. $670 billion) and of European foreign affiliates in the U.S. (est. $665 billion) in 2021 of $1.35 trillion was larger than the total output of such countries as Mexico, the Netherlands, or Indonesia.

- U.S.-based foreign firms generated $347 billion in U.S. exports to the world in 2020; European firms accounted for 57% of the total. U.S-based German companies exported over $47 billion, followed by those from the UK ($42 billion) and the Netherlands ($38 billion).

- U.S. foreign affiliate sales in Europe of $3.1 trillion in 2021 were 61% more than total U.S. global exports of $2.5 trillion and roughly half of total U.S. foreign affiliate sales globally.

- Total transatlantic affiliate sales, estimated at $5.9 trillion in 2021, easily rank as the most integrated commercial partnership in the world.

- Foreign investment and affiliate sales drive transatlantic trade. 65% of U.S. imports from the EU+UK consisted of intra-firm trade in 2020 – much higher than U.S. intra-firm imports from Asia-Pacific nations (around 40%) and well above the global average (48%). Percentages are notably high for Ireland (85%), the Netherlands (74%) and Germany (69%).

- Intra-firm trade also accounted for 39% of U.S. exports to the EU+UK, and 58% to the Netherlands, 38% to Germany and to the Netherlands, 35% to France and 31% to the UK.

The U.S. in Europe

- Over many decades no place in the world has attracted more U.S. FDI than Europe. During the past decade Europe attracted 57.3% of total U.S. global investment – more than in any previous decade. We are early in this decade, but thus far, Europe's share of U.S. FDI outflows has actually increased to 64.3% of the total. Part of this dynamic reflects weakening U.S. investment flows to China.

- Measured on a historic cost basis, the total stock of U.S. FDI in Europe was $4 trillion in 2021 – 61% of the total U.S. global investment position and more than four times U.S. investment in the Asia-Pacific region ($957 billion). U.S. FDI in the UK alone in 2021 was over 8 times such investment in China.

- New U.S. FDI in Europe in 2022 totaled $235 billion, 4% less than record-setting U.S. FDI in Europe of $244 billion in 2021.

- In the first three quarters of 2022, U.S. companies invested $172 billion in Europe – 10 times more than what they invested in the BRICs ($16.5 billion total in Brazil, Russia, India and China) and 26 times more than what they invested in China ($6.7 billion).

- U.S. companies in the first nine months of 2022 earned an estimated $239 billion from their operations in Europe – 2.7 times what they earned from operations in all of Asia.

- Official figures can be misleading when it comes to the original source and the ultimate destination of FDI. For instance, Germany officially accounted for only 4% of U.S. FDI flows since 2010. Yet, much U.S. FDI flows into Germany from neighboring countries. Whereas official figures indicate that FDI stock in Germany from the U.S. in 2017 was $90 billion, "real FDI" stock from the U.S. to Germany was actually $170 billion. Similarly, "real FDI" links from Germany to the U.S. are considerably higher than official statistics might indicate. The same is true for other important bilateral investment links.

- In 2020, U.S. FDI flows to nonbank holding companies in Europe rebounded sharply to $62.8 billion. Holding companies accounted for $2.9 trillion, or about 47% of the global U.S. outward FDI position of approximately $6.2 trillion, and 54% of total U.S. FDI stock in Europe.

- Excluding holding companies, total U.S. FDI stock in Europe in 2020 amounted to $1.7 trillion – a much smaller figure but still more than 2.5 times larger than total U.S. investment in the Asia-Pacific region (FDI stock of $654 billion excluding holding companies).

- From 2009-2021 Europe still accounted for over half of total U.S. FDI outflows globally and more than double the share to Asia when flows from holding companies are removed from the overall figures.

- U.S. and UK firms accounted for 32% and 26%, respectively, of foreign acquisitions in the EU in 2021; Chinese companies accounted for 2%.

- Of the top twenty global export platforms for U.S. multinationals in the world, nine are located in Europe. For U.S. companies, Ireland is the number one platform in the world from which their affiliates can reach foreign customers. Switzerland, ranked third, remains a key export platform and pan-regional distribution hub for U.S. firms.

- In 2021 Europe accounted for roughly 63% – $19 trillion – of corporate America's total foreign assets globally. Largest shares: the UK (21%, $6.2 trillion in 2020) and the Netherlands (10%, $3.1 trillion in 2020).

- America's asset base in Germany ($1.1 trillion in 2020) was more than a third larger than its asset base in all of South America and more than double its assets in China.

- America's assets in Ireland ($2 trillion in 2020) were light years ahead of those in China ($487 billion).

- Ireland has also become the number one export platform for U.S. affiliates in the entire world. Exports from U.S. affiliates based in Ireland reached $404 billion in 2020, about 5 times more than U.S. affiliate exports from China and about 3.5 times more than affiliate exports from Mexico.

- Aggregate output of U.S. affiliates globally reached $1.4 trillion in 2021; Europe accounted for half.

- U.S. affiliate output in Europe ($643 billion) in 2020 was 73% larger than affiliate output in the entire Asia-Pacific region ($383 billion). U.S. affiliate output in China ($78 billion) and India ($38 billion) lags behind U.S. affiliate output in the UK ($157 billion) and Ireland ($107 billion).

- Sales of U.S. affiliates in Europe were roughly 70% larger than the sales of U.S. affiliates in the entire Asian region in 2020. Affiliate sales in the UK ($649 billion) were double total sales in South America. Sales in Germany ($343 billion) were roughly double combined sales in Africa and the Middle East.

- U.S. affiliate income from Europe reached a record $325 billion in 2022, about 2.7 times U.S. affiliate income in all of Asia and 48 times what U.S. companies earned from operations in China.

- Europe accounted for roughly 56% of U.S. global foreign affiliate income in the first nine months of 2022.

- U.S. affiliate income from China and India in 2021 ($17.9 billion) was a fraction of what U.S. affiliates earned in the Netherlands, Ireland, or the UK.

- U.S. affiliate income in the first three quarters of 2022 in Germany ($8.6 billion) was slightly less than in China ($9 billion) and more than in India ($5.8 billion).

Europe in the U.S.

- Europe accounted for over 50% of global FDI that flowed into the U.S. in the first three quarters of 2022. Annualizing data, U.S. FDI inflows from Europe are estimated to come in at $235 billion in 2022, versus just $87 billion in 2020.

- The U.S. accounted for almost 25% of the EU27's total outward FDI position globally in 2020 – 10 times more than the EU's investment position in China, which accounted for less than 2.5%.

- Total European stock in the U.S. of $3.2 trillion in 2021 was more than three times the level of Asian investment stock in the U.S. Germany's total FDI stock in the United States totaled $403 billion in 2021. Chinese FDI stock in the United States was less than one-tenth of that total ($38 billion).

- Europe accounted for 64% of the $5 trillion of foreign capital invested in the U.S. as of 2021 on a historic cost basis.

- The bulk of the capital was sunk by Dutch firms (total stock amounting to $630 billion), British firms ($512 billion), German ($403 billion) and Swiss companies ($282 billion).

- In 2020 total assets of European affiliates in the U.S. were an estimated $8.3 trillion. UK firms ranked first, followed by those from Germany, Switzerland and France.

- In 2020 European assets accounted for about 51% of total foreign assets in the United States.

- We estimate that European-owned assets in the U.S. rose in 2021 to $8.4 trillion.

- European affiliates in the U.S. earned an estimated $151 billion in 2022, the 2nd highest level on record, following a record-breaking $167 billion in 2021.

- Both UK and German affiliate output in the U.S. rose 5% in 2021. UK firms accounted for an est. 25% ($158 billion) and German companies for 20% ($120 billion) of total European affiliate output in the U.S. in 2021.

- UK firms were the largest source of greenfield foreign investment projects in 18 U.S. states during the ten-year period from July 2011-June 2021. German companies led in 12 states, followed by Canadian companies in 9 states and Japanese companies in 7.

- European firms in the United States earned record income in 2021 in a spectacular rebound from pandemic year 2020. Things leveled off somewhat in 2022, but European firms still earned roughly $151 billion in the United States.

- European companies operating in the U.S. accounted for nearly 61% of the roughly $1.1 trillion contributed by all foreign firms to U.S. aggregate production in 2020. European affiliate output ($671 billion) was more than four times larger than Japanese affiliate output ($152 billion), six times larger than Canadian affiliate output ($112 billion) and 48 times Chinese affiliate output ($14 billion).

- Chinese affiliate output in the U.S. of just $14 billion in 2019 was less than that of Sweden ($21 billion).

- Affiliate sales, not trade, are the primary means by which European firms deliver goods and services to U.S. consumers. In 2021 European affiliate sales in the U.S. ($2.7 trillion) were more than triple U.S. imports from Europe ($555 billion).

- Sales by British affiliates in the U.S. totaled $555 billion in 2020, closely followed by German affiliate sales ($554 billion), and those by Dutch affiliates ($315 billion).

Transatlantic Trade

- U.S.-Europe goods trade reached an all-time high of $1.2 trillion in 2022. U.S. goods exports to Europe rose 25%, led by surging U.S. energy flows.

- The EU and the United States are each other's most important trading partners. U.S.-EU trade in goods in 2022 – a record $909.45 billion – exceeded EU-China goods trade of $897.34 billion and was 25% higher than U.S.-China goods trade of $690.56 billion.

- The EU+UK accounted for 19% of U.S. goods imports in 2022, the same as in 2017; China accounted for 16.5% in 2022, a drop from 21.6% in 2017.

- Most trade today is conducted through intermediates, known as indirect trade. The United States, Germany, France and the Netherlands are four of the world's top five indirect traders. While conventional trade statistics portray China as the world's leading exporter, it ranks third in terms of indirect exports – and its share is falling.

- 45 of the 50 U.S. states, including the Pacific coast's largest state of California, export more goods to Europe than to China, in many cases by a wide margin.

- Texas is the top U.S. state exporter of goods to Europe, followed by California, New York, New Jersey and Illinois.

- In 2021 Utah exported 11 times more goods to Europe than to China. New York exported 8 times more, Florida 6.5 times more, Maryland 4.7 times more. Illinois, Missouri and New Jersey each exported 4 times more, Pennsylvania and Kentucky 3.7 times more, and Texas 3 times more. California exported twice as many goods to Europe as to China.

- Germany was the top European export market for 23 U.S. states, the UK for 9, and Belgium for 6 in 2021. Germany was also the top source of European imports for 30 U.S. states; Switzerland was the leading European supplier for 6 states.

Transatlantic Services

- The U.S. and Europe are the two leading services economies in the world. The U.S. is the largest single country trader in services, while the EU is the largest trader in services among all world regions. The U.S. and EU are each other's most important commercial partners and major growth markets when it comes to services trade and investment. Moreover, deep transatlantic connections in services industries, provided by mutual investment flows, are the foundation for the global competitiveness of U.S. and European services companies.

- Five of the top ten export markets for U.S. services are in Europe. Europe accounted for 41% of total U.S. services exports and for 42% of total U.S. services imports in 2021.

- U.S. services exports to Europe reached a record $332 billion in 2021, a sharp rise from pandemic-year 2020. The U.S. had a $101 billion trade surplus in services with Europe in 2021, compared with its $219 billion trade deficit in goods with Europe.

- U.S. imports of services from Europe rebounded in 2021 to $230 billion, from $197 billion in 2020. The UK, Germany, Switzerland, Ireland, and France are top services exporters to the U.S.

- EU27 services trade with the U.S. of $702.12 billion in 2021 was 6 times EU-China services trade of $115.54 billion.

- Moreover, foreign affiliate sales of services, or the delivery of transatlantic services by foreign affiliates, have exploded on both sides of the Atlantic over the past few decades and become far more important than exports.

- Sales of services of U.S. affiliates in Europe totaled $997 billion, or 56% of the global total, in 2020 – 3 times more than U.S. services exports to Europe of $332 billion.

- Services by U.S. firms based in the UK and UK companies based in the US totaled $435.4 billion in 2020 – 3.4 times greater than U.S.-UK overall trade in services of $116.3 billion. The contrast is even greater in terms of U.S.-German commercial ties: services by U.S. companies based in Germany and German firms based in the U.S. totaled $252.1 billion. That's 4.1 times U.S.-German services trade of $61.4 billion.

- The UK alone accounted for 30% ($274 billion) of all U.S. affiliate services sales in Europe in 2020 – more than combined U.S. affiliate services sales in Latin America and the Caribbean ($158 billion), Africa ($15 billion) and the Middle East ($26 billion). Affiliate services sales in Ireland remained quite large – $172 billion.

- European affiliate sales of services in the U.S. of $666 billion in 2020 were about one-third less than U.S. affiliate sales of services in Europe.

- Nonetheless, European companies are the key provider of affiliate services in the U.S. ($170 billion in 2020). German affiliates led in terms of affiliate sales of services ($170 billion), followed closely by US-based UK firms ($161 billion).

- European companies operating in the U.S. generated an estimated $680 billion in services sales in 2021 – roughly 3 times more than European services exports to the U.S. of $230 billion.

The Transatlantic Digital Economy

- Transatlantic data flows are critical to enabling the $7.1 trillion EU-U.S. economic relationship. They account for more than half of Europe's data flows and about half of U.S. data flows globally. Over 90% of EU-based firms transfer data to and from the United States.

- European and U.S. cities are major hubs of cross-border digital connectivity. Europe is the global leader, with tremendous connected international capacity. Frankfurt, London, Amsterdam and Paris substantially outpace North American and Asian cities.

- The United States currently accounts for over 53% of the world's operational hyperscale infrastructure, measured by critical IT load. More than one-third of U.S. hyperscale capacity is located in one state – Virginia. Virginia has far more hyperscale data center capacity than either China or all of Europe.

- Transatlantic cable connections are the densest and highest capacity routes, with the highest traffic, in the world. Submarine cables in the Atlantic carry 55% more data than transpacific routes.

- The U.S. and Europe are each other's most important commercial partners when it comes to digitally-enabled services. The U.S. and the EU are also the two largest net exporters of digitally-enabled services to the world.

- U.S. trade in digitally-deliverable services of $963.4 billion led the world in 2021, followed by that of the UK ($677.2 billion), Ireland ($639.9 billion), Germany ($454.7 billion), China ($359.3 billion), the Netherlands ($329.2 billion), and France ($312.5 billion).

- In 2021 the U.S. registered a $262.6 billion trade surplus in digitally-enabled services with the world. Its main commercial partner was Europe, to which it exported $283.3 billion in digitally-enabled services and from which it imported $134.7 billion, generating a trade surplus with Europe in this area of $148.6 billion.

- U.S. exports of digitally-enabled services to Europe were more than double U.S. digitally-enabled services exports to the entire Asia-Pacific region, and more than combined digitally-enabled services exports to the Asia-Pacific, Latin America and Other Western Hemisphere, and the Middle East.

- In 2020, EU member states collectively exported €1 trillion and imported €1 trillion in digitally-enabled services to countries both inside and outside the EU. Excluding intra-EU trade, EU member states exported €551 billion and imported €594.5 billion, resulting in a deficit of €43.3 billion for these services.

- Digitally-enabled services represented 61% of all EU services exports to non-EU countries and 68% of all EU services imports from non-EU countries.

- In 2020 the U.S. accounted for 22% of the EU's digitally-enabled services exports to non-EU countries, and 34% of EU digitally-enabled services imports from non-EU countries.

- The U.S. purchased €122.1 billion, making it the largest recipient of EU27 digitally-enabled services exports – ahead of the UK (€121.1 billion) and just slightly behind the entire region of Asia and Oceania (€138.1 billion).

- Digitally-enabled services are not just exported directly, they are used in manufacturing and to produce goods and services for export. Over half of digitally-enabled services imported by the U.S. from the EU is used to produce U.S. products for export, and vice versa.

- In 2020, EU member states imported just over €1 trillion in digitally-enabled services. 41% originated from other EU member states. Another 20% (€204.7 billion) came from the U.S., making it the largest supplier of these services. The EU imports of these services from the U.S. were almost double imports from the UK (€114.2 billion).

- Even more important than both direct and value-added trade in digitally-enabled services, however, is the delivery of digital services by U.S. and European foreign affiliates. U.S. services supplied by affiliates abroad were $1.65 trillion, roughly 2.3 times global U.S. services exports of $726.43 billion. Moreover, half of all services supplied by U.S. affiliates abroad are digitally-enabled.

- 58% of the $998 billion in services provided in Europe by U.S. affiliates in 2019 was digitally-enabled.

- U.S. affiliates in Europe supplied $585.5 billion in digitally-enabled services in 2019, more than double U.S. digitally-enabled exports to Europe.

- European affiliates in the U.S. supplied $287 billion in digitally-enabled services in 2019, double European digitally-enabled exports to the U.S.

- In 2020, Europe accounted for 72% of the $333 billion in total global information services supplied abroad by U.S. multinational corporations through their majority-owned foreign affiliates.

- U.S. overseas direct investment in the "information" industry in the UK alone was 66% more than such investment in the entire Western Hemisphere outside the United States, and roughly the same as such investment in all of Asia, the Middle East and Africa combined, and 14 times such investment in China. Equivalent U.S. investment in Germany was 3.6 times more than in China.

- Including all types of e-commerce, the United States was the top market in the world in 2019; online sales were 2.8 times higher than in Japan and 3.7 times higher than in China. North America and Europe accounted for six of the top 10 e-commerce countries.

- North American and European countries account for 9 of the top 10, and 17 of the top 20, countries when it comes to combined digital and entrepreneurial ecosystem development.

- The U.S. leads the world in international trade in products delivered through data flows, followed by the UK, France, Germany, India, Ireland, the Netherlands, and Switzerland.

Transatlantic Jobs

- European companies in the U.S. employ millions of American workers and are the largest source of onshored jobs in America. Similarly, U.S. companies in Europe employ millions of European workers and are the largest source of onshored jobs in Europe.

- U.S. and European foreign affiliates directly employed an estimated 9.7 million workers in the pandemic-plagued year of 2020, 300,000 more than in 2019. Employment levels rose further in 2021 and 2022.

- These figures understate overall job numbers, since they do not include
  - jobs supported by transatlantic trade flows;
  - indirect employment effects of nonequity arrangements such as strategic alliances, joint ventures, and other deals; and
  - indirect employment generated for distributors and suppliers.

- U.S. affiliates directly employed an estimated 4.8 million workers in Europe in 2021 – 33% more than in 2000.

- Roughly 34% of the 14.4 million people employed by U.S. majority-owned affiliates around the world in 2020 lived in Europe; that share is down from 41% in 2009.

- U.S. affiliates employed more manufacturing workers in Europe in 2020 (1.8 million) than they did in 1990 (1.6 million), and about the same as in 2000 (1.9 million). Manufacturing employment has declined in some countries but has rebounded in others.

- Poland has been a big winner. Between 2000 and 2020, U.S. manufacturing affiliates in Poland employed almost 3 times more people (51,000 vs. 138,000). They employed 30,000 fewer people in Germany (388,000 vs. 358,000), 71,000 fewer in France (249,000 vs. 178,000), and 148,000 fewer in the UK (431,000 vs. 283,000).

- U.S. affiliates employ more Europeans in services than in manufacturing and this trend is likely to continue. Manufacturing accounted for 38% of total employment by U.S. affiliates in Europe in 2020. U.S. affiliates employed nearly 336,000 European workers in transportation and 257,000 in chemicals. Wholesale employment was among the largest sources of services-related employment, which includes employment in such areas as logistics, trade, insurance and other related activities.

- European majority-owned foreign affiliates directly employed an estimated 5 million U.S. workers in 2021, up from 4.9 million in 2020.

- European firms employed roughly 61% of all U.S. workers on the payrolls of majority-owned foreign affiliates in 2022.

- The top five European employers in the United States in 2021 were firms from the UK (1.2 million jobs), Germany (885,000), France (740,000), the Netherlands (569,000) and Switzerland (487,000).

- UK firms were the largest sources of onshored jobs in 22 U.S. states in 2021. Canadian companies led in ten states, Japanese companies in nine, German firms in five, and Dutch companies in three states.

- The top five U.S. states in terms of jobs provided directly by European affiliates in 2020 were California (473,000), Texas (393,000), New York (361,000), Pennsylvania (245,000), and Illinois (228,000).

The Transatlantic Energy Economy

- U.S. liquefied natural gas (LNG) exporters supplied more than three-fourths of Europe's additional gas needs in the critical months following the outbreak of Russia's war, and accounted for more than 50% of Europe's LNG supplies for 2022 as a whole. More than half of U.S. global LNG exports went to Europe in 2022. U.S. exporters shipped roughly 2.5 times more LNG supplies to Europe in 2022 than in 2021, and 3 times more than they supplied to all of Asia in 2022.

- U.S. crude oil exports to Europe jumped 70% in 2022, and now account for 12% of Europe's oil supplies. In the first six months of 2022 Europe surged ahead of Asia as the top purchaser of U.S. crude oil.

- U.S. companies in Europe have become a driving force for Europe's green revolution, accounting for more than half of the long-term renewable energy purchase agreements signed in Europe since 2007.

- European companies are the leading source of foreign direct investment (FDI) in the U.S. energy sector.

- Between 2017 and 2022, U.S. investors participated in 758 EU-based cleantech deals and EU investors joined 682 U.S.-based cleantech deals. On average, U.S. and EU companies that received transatlantic investments reached growth stage, and received growth funding, faster than those that did not: 20% faster for EU-based companies; 8% faster for U.S.-based companies. Deal sizes for EU innovator investment rounds that included U.S. risk capital were significantly larger than those that did not involve a U.S. investor.

The Transatlantic Innovation Economy

- Bilateral U.S.-EU flows in R&D are the most intense between any two international partners. In 2020 U.S. affiliates spent $31.6 billion on R&D in Europe, 54% of total U.S. R&D conducted globally by affiliates.

- R&D expenditures by U.S. affiliates were the greatest in the UK ($6.0 billion), Germany ($5.7 billion), Switzerland ($5.5 billion), Ireland ($4.0 billion), Belgium ($2.2 billion) and France ($1.9 billion). These six nations accounted for roughly 80% of U.S. spending on R&D in Europe in 2020.

- In the U.S., R&D expenditures by majority-owned foreign affiliates totaled $71.4 billion in 2020; European affiliates accounted for 67% of that total.

- German-owned firms were the largest foreign source of R&D in the United States in 2020, spending some $12.7 billion, or 26% of the total of European R&D. Swiss firms ranked second ($10.2 billion or 21.5% of total), followed by British firms ($6.6 billion or 13.5%).

Remarkably Resilient: The Transatlantic Economy in 2023

The transatlantic economy has proven to be remarkably resilient in the face of seismic shocks that have shaken the world. Despite full-blown war in the heart of Europe, ongoing pandemic uncertainties, supply chain disruptions, dramatic energy shifts, high inflation, tightening financial conditions, and tensions with China, the key drivers of the transatlantic economy – investment, trade and income – posted strong results again in 2022.

Transatlantic trade in goods reached an all-time high of $1.2 trillion last year. U.S. goods exports to Europe rose by 25%, led by surging U.S. energy flows. U.S. goods exports to Europe rose by 25%, led by surging U.S. energy flows. U.S.-EU trade in goods in 2022 – a record $909.45 billion – exceeded EU-China goods trade of $897.36 billion and was 25% higher than U.S.-China goods trade of $690.56 billion. U.S. foreign affiliate income earned in Europe reached a record $325 billion in 2022, while European affiliates in the U.S. earned an estimated $151 billion – less than in 2021 ($167 billion), but still the second largest annual figure ever.

U.S. foreign direct investment (FDI) flows to Europe dropped by just 4%, to $235 billion, in 2022, according to our estimates. That's a solid figure considering Europe's energy crunch and war on the continent. And it follows record U.S. investment in Europe of $244 billion in 2021 – the second strongest annual level on record.

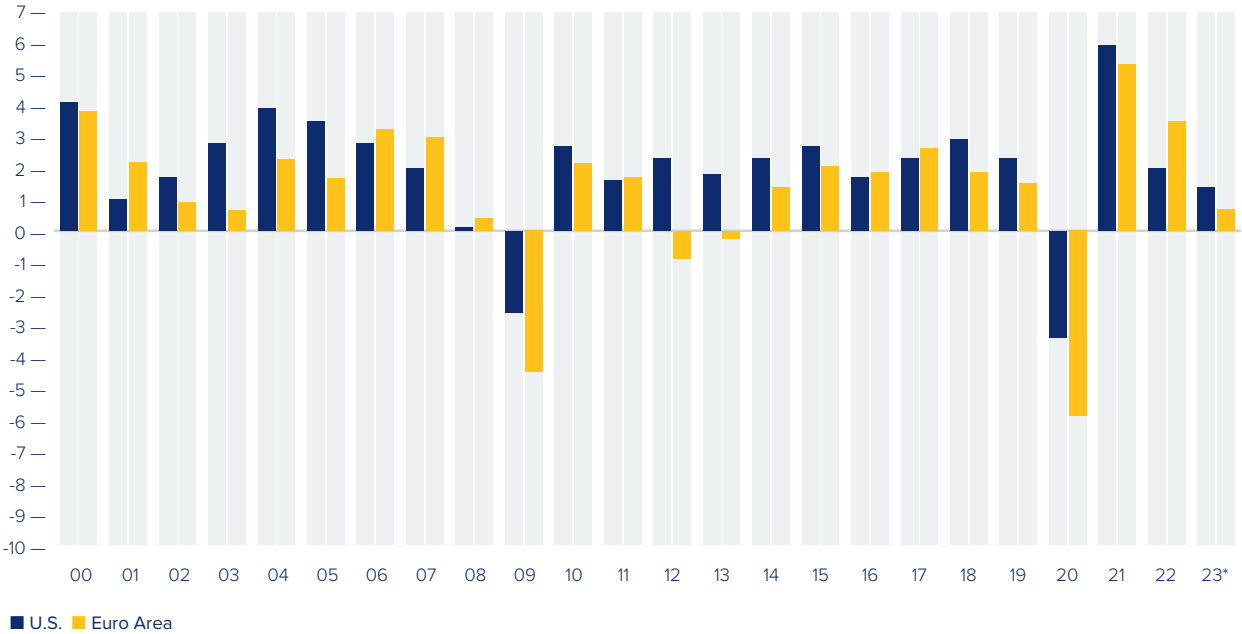
These figures are emblematic of the dense ties that bind North America to Europe and form the solid geoeconomic and geostrategic ground from which each side of the North Atlantic can address tremors still to come in 2023 and beyond. The $7.1 trillion transatlantic economy remains the largest and wealthiest market in the world, employing 16 million workers in mutually "onshored" jobs on both sides of the Atlantic.

Transatlantic Tremors

U.S. and European economic growth is likely first to slow and then to gather speed over the course of this year. Overall for 2023, the International Monetary Fund expects the U.S. economy to grow by 1.4% and the euro area to grow by 0.7%. These levels are down from 2021 and 2022, but still positive. Growth is expected to accelerate in 2024.

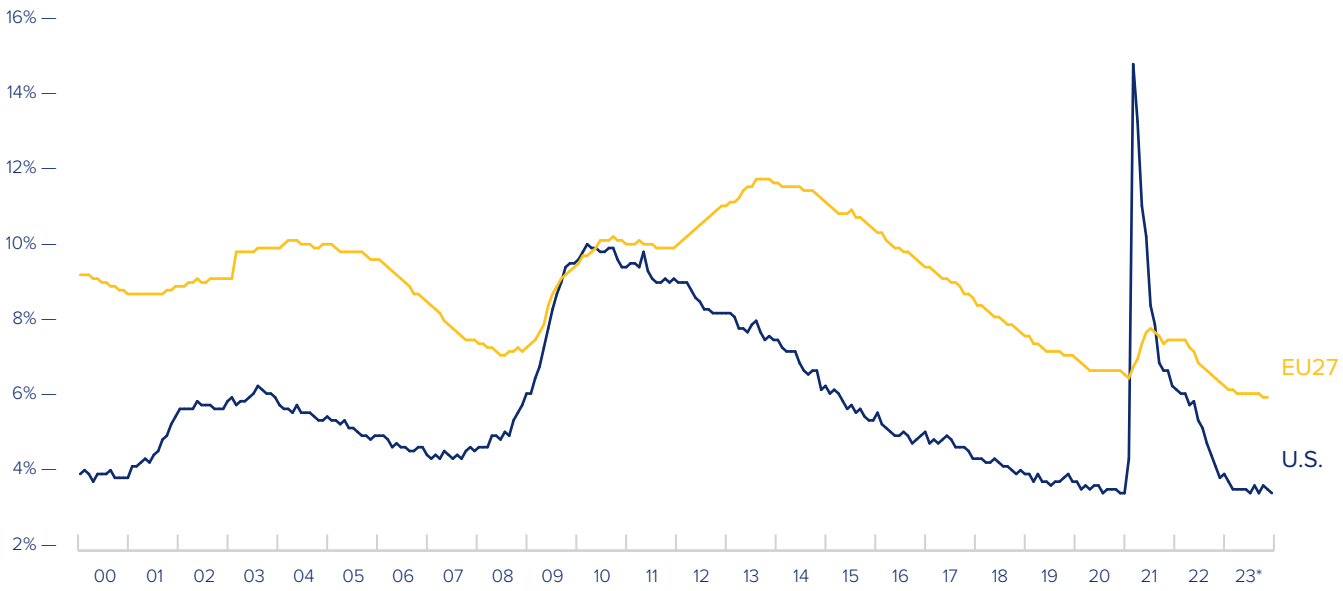
One hinge variable is the war in Ukraine, which has replaced the pandemic as the greatest strain on global trade.[1] Russia's aggression may have shaken the world economy, but it has also reinvigorated the Atlantic alliance. North American-

Table 1. **U.S. vs. Euro Area** Real GDP, Annual Percent Change, 2000-2023



*IMF Estimates for 2021 and 2022. *IMF Projection for 2023.*
Data as of January 2023.
Source: International Monetary Fund.

Table 2. **U.S. vs. EU Unemployment Rate** Harmonized Unemployment Rate, % of Labor Force (Monthly)



Source: OECD.
U.S. data through December 2022. EU data through November 2022. EU excludes the UK.

European unity has been remarkable, exemplified by tough and coordinated sanctions and export controls against Russia; herculean efforts to wean Europe off its dangerous dependence on Russian energy; considerable sums of military, political, financial and humanitarian support for Ukraine; and actions to strengthen NATO defenses. As U.S. Treasury Secretary Janet Yellen noted at the G20 Summit in November 2022, "ending Russia's war is the single best thing we can do for the global economy." We discuss Western efforts to support Ukraine and to sanction Russia in Boxes 3 and 4.

The war does, however, complicate the challenges facing the world's central banks. Rarely has the world seen such aggressive monetary action from the stewards of credit. Leading the way, the U.S. Federal Reserve raised its benchmark rate seven times last year, from 0.25% to over 4%. The European Central Bank (ECB) boosted rates four times in 2022, taking the rate to 2.5% at year-end, while the Bank of England raised its rate eight times in 2022. Monetary policy works with a lag, so the residual effects of tighter global credit conditions (softer final demand, lower capital investment, reduced earnings) will become more evident in 2023.

2022: a year of resilience
Transatlantic trade in goods
$1.2 trillion

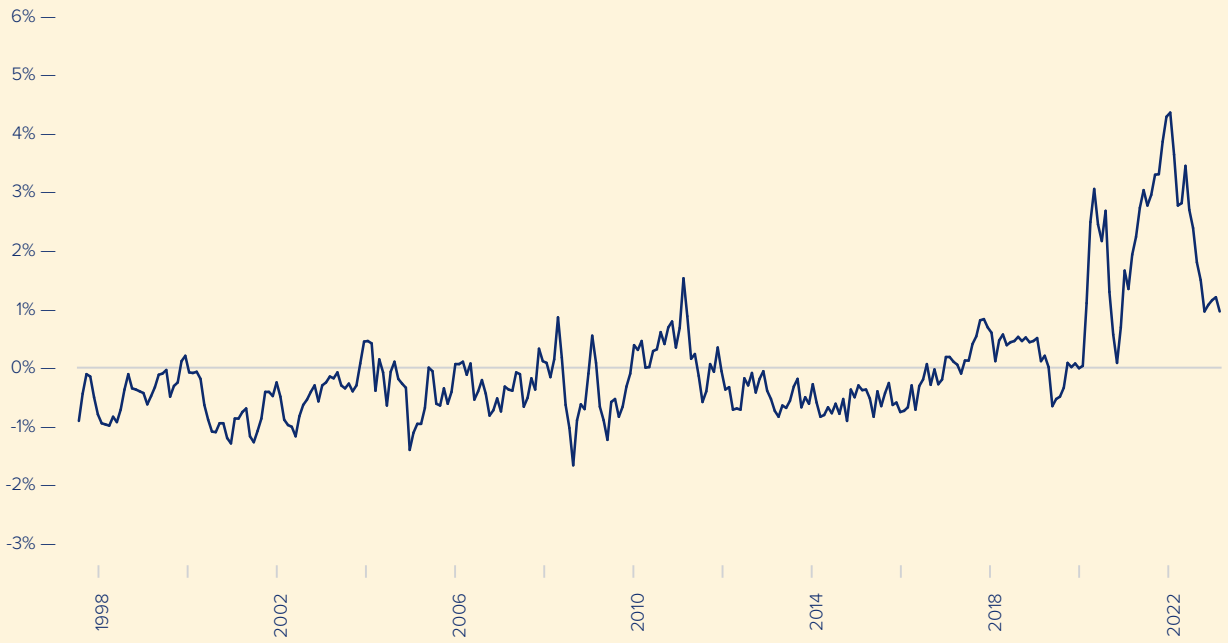
FDI flows
(2022 estimates)
$235 billion
U.S. to Europe
$170 billion
Europe to U.S.

Growth
(2023 estimates)
1.4%
U.S.
0.7%
Euro Area

Box 1. Supply Chains Still Under Pressure

The transatlantic economy has been rattled by disturbances to the supply chains that account for over half of global trade in goods.[2] While the U.S. Federal Reserve reports that the most acute disruptions have eased, supply chain pressures remain at levels far higher than pre-pandemic times, except for a brief flare-up in 2011 (Table 3). According to the European Bank for Reconstruction and Development, more than three-quarters of all firms participating in global supply chains have implemented at least one measure to make their supply chains more resilient.[3]

Table 3. Global Supply Chain Pressures, 1997-2023 (Standard deviation from average value)



Source: Federal Reserve Bank of New York, https://www.newyorkfed.org/research/policy/gscpi#/interactive.

One risk for 2023 is that central banks on both sides of the pond err on the side of keeping policies too tight for too long, as they focus on pulling headline inflation back to target. The prospect that each side of the Atlantic might flirt with recession in 2023 has tempered future inflation expectations. Indeed, it seems increasingly likely that economies on both sides of the economy may be able to find the elusive "soft landing," avoiding a recession entirely while also continuing to manage headline inflation.

U.S. headline inflation, after reaching a peak of 9.1%, began to reverse in July 2022 and was running at a year-over-year rate of 6.5% in December. Slowing demand and easing supply chain constraints has helped alleviate pricing pressures on goods, while services inflation is expected to peak in early 2023.

Inflationary pressures in Europe have also peaked, with lower energy costs helping to slow year-over-year price increases to 9.2% in December, versus 10.1% in November. Energy price caps, lower commodity prices, unclogged supply chains, and the cyclical effects of slower economic growth have converged to ease transatlantic inflationary expectations. The European Commission predicts 6.4% consumer price growth and 5.6% euro area inflation in 2023. Still, U.S. and euro area inflation rates are well above the Fed/ECB targets of 2%.

Price stability in Europe remains challenging given the war and the continent's vulnerabilities to global oil and natural gas prices. Europe has avoided a full-blown energy crisis and in less than a year accomplished a remarkable reduction in energy imports from Russia. Gas prices have largely returned to levels seen before the war but are still roughly six times higher than those across the Atlantic. We discuss the transatlantic energy economy in Chapter 4.

Box 2. The Windsor Framework and UK-EU Relations Post-Brexit

After two tense years following the UK's departure from the EU, London and Brussels inked the "Windsor Framework" at the end of February 2023 to clarify contentious elements of the Northern Ireland protocol to the UK-EU Withdrawal Agreement. The Framework could remove a major thorn in relations and pave the way to a more robust partnership.

The Withdrawal Agreement treats Northern Ireland, which is part of the UK, as being within the EU customs area, to prevent the need for a hard border on the island of Ireland. But it also required checks on goods within the UK flowing from Great Britain to Northern Ireland. This essentially created a customs border in the middle of the Irish Sea. London insisted on revisions to dispense with those checks and diminish the role of the European Court of Justice in settling disputes. Pro-UK unionists in Northern Ireland refused to take their seats in the region's elected assembly at Stormont until the issues were resolved to their liking.

Northern Ireland continues to follow EU rules for goods trade, but the Windsor Framework simplifies and clarifies arrangements in five areas. First, goods within the UK coming from Great Britain to Northern Ireland will now be channeled through paperwork-light "green lanes" if destined for Northern Ireland and paperwork-heavy "red lanes" if intended for the EU. The EU will accept the UK's public health standards so agri-food can enter Northern Ireland, although those goods must be labeled "not for EU" by 2025.

Second, the UK will now review most Northern Ireland subsidies so they do not have to be referred to Brussels. Third, UK domestic value-added-tax (VAT) changes will apply to Northern Ireland. This had previously been prohibited under the Northern Ireland protocol. The UK agreed not to undercut most EU minimum VAT rates immediately, although both parties will now negotiate a list of goods where this could be possible over the next five years.

Fourth, the Northern Ireland legislative assembly can now pull an "emergency brake" to stop the implementation of new or updated EU rules in "exceptional circumstances." Finally, the European Court of Justice remains the ultimate arbiter of UK-EU arrangements, despite calls by some in the UK to create instead an international arbitration mechanism, but London says that the Windsor Framework now severely circumscribes the number of EU laws that are applicable in Northern Ireland.[4]

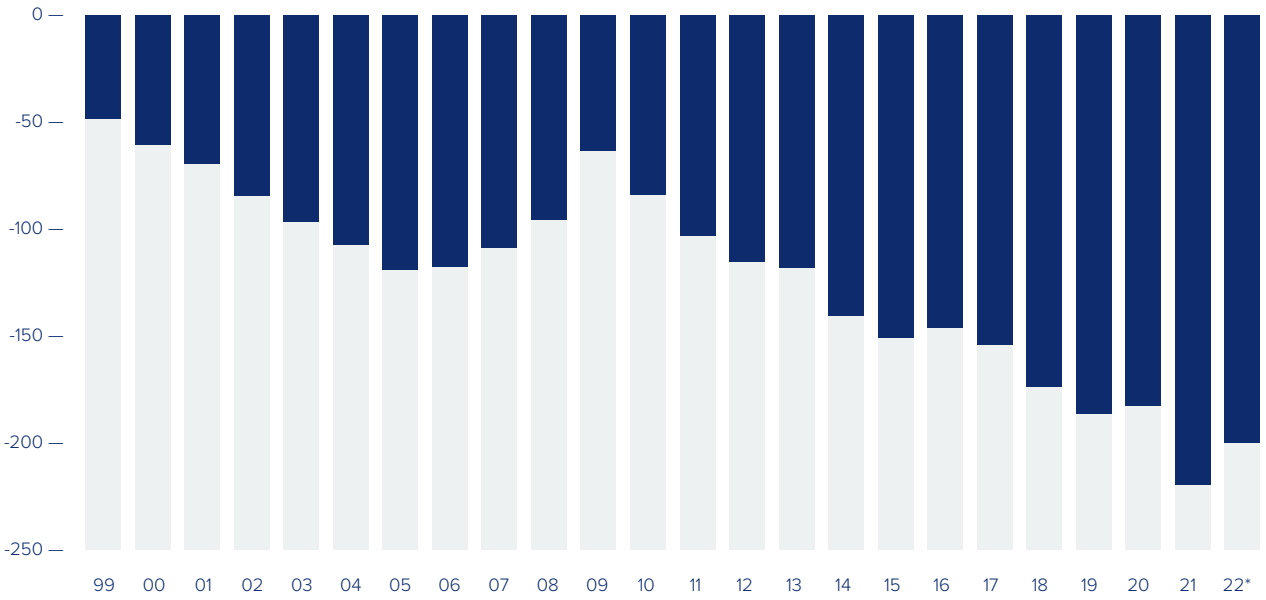
The Windsor Framework could help spark the UK economy, which is the only G7 country yet to surpass its pre-Covid GDP. It could also get UK-EU relations back on track: bilateral trade has recovered to pre-pandemic levels, but the EU's trade with other major partners has rebounded far more robustly.[5] As of this writing, however, it is unclear whether the Framework will find majority support within the UK Parliament or in the Northern Ireland Assembly at Stormont.

Additional uncertainties also loom. Before the Windsor Framework, the two sides kept deferring deadlines for some types of customs provisions, rules-of-origin declarations, medicines labelling, and food controls, along with product conformity assessments. Now the UK has introduced a Retained EU Law Bill that proposes to review thousands of laws developed by the EU when the UK was a member, and revoke them by default by the end of 2023 unless an active decision is made to keep or adapt them.[6] This portends significant further turbulence for many companies if the measure is adopted in its current form and on its current timeline.

Clearer UK-EU arrangements promise to boost the UK's economic relationship with the United States. In recent years, U.S. companies in Europe reported concerns about new regulatory barriers to trade, geographic restrictions on services, and rules-of-origin requirements. The loss of access to the EU Single Market from the UK had repercussions for U.S. services companies and manufacturers operating in Europe. U.S.-UK talks on a possible free trade agreement are still on hold.

Still, U.S.-UK commercial ties are robust and thriving. Measured on an historic cost basis, U.S. companies had invested a record $1 trillion in the UK economy and British firms roughly $512 billion in the U.S. economy by 2021 – directly supporting 2.75 million jobs in both countries. U.S. FDI in the UK in 2021 was 8 times more than such investment in China. The United States is the UK's top trading partner in both goods and services, exporting £161.5 billion ($199.1 billion) in goods to the UK, and importing £101.2 billion ($124.8 billion), in 2022.[7]

Table 4. **U.S. Merchandise Trade Balance with the EU27** ($Billions)



**2022 author estimates.*
Source: U.S. Census Bureau.
Data as of January 2023.

Goods are no longer the preeminent driver of global connections; flows of services, international students, and intellectual property grew about twice as fast as goods flows in 2010-2019.

Navigating Globalization's Shifting Currents

Global turmoil has led to suggestions that the world has entered a period of de-globalization. A closer look reveals that technological, policy and commercial drivers are interacting to reshape, not curtail, global flows. Technological drivers are accelerating globalization, while policy and commercial considerations are leading to strategies of "derisking" and diversification, as we discuss in Chapter 3. These drivers are carving currents that carry some risks, but far greater opportunities, for the transatlantic economy.

Global flows of people, capital, and goods are facing steeper policy barriers, yet migration was at historic highs in 2020 and 2021, capital flows grew by more than 50% a year in 2019-2021, and goods flows hit a record high in 2021. Global trade in goods in September 2022 was 10% higher than the average for the pre-crisis year 2019, and slightly higher than the level before Russia's renewed invasion of Ukraine. Still, goods are no longer the preeminent driver of global connections; flows of services, international students, and intellectual property grew about twice as fast as goods flows in 2010-2019. Data flows grew by nearly 50% annually during this period, and were turbocharged during the pandemic years, as we discuss in Chapter 5.[8]

These flows are all strengths of the transatlantic economy. Knowledge-intensive and intangible-heavy global value chains are also more concentrated than others, largely in deeply-intertwined North Atlantic connections, which we explore in this book.[9]

North America and Europe have been among the main beneficiaries of the expansion of global flows, as we demonstrate in our annual surveys. Given the turbulence and tensions of recent years, officials on each side of the Atlantic are now acting to mitigate strategic vulnerabilities and to ensure that people and workers across our economies benefit from this increasing interconnectivity. We discuss the U.S. and EU "protect and promote" agendas in Chapter 3.

On each side of the Atlantic there is a rising chorus calling for "reshored" production and greater self-sufficiency. In Europe, some call for greater "sovereignty" in the digital sphere or in other sectors like medicines or critical materials. The risk is that such calls could lead to more entrenched protectionism that hampers the ability of transatlantic firms to compete fairly in markets on both sides of the pond and beyond. Particularly relevant in this context are current debates about the impact of the U.S. Inflation Reduction Act and the EU's Green Deal and related subsidy measures, which we discuss in Chapter 4.

The transatlantic economy remains the most interconnected, robust, and resilient commercial artery in the world.

Lost in these debates is the fact that U.S. and European companies over many decades have woven a dense web of deep transatlantic connections that is proving to be a strength, not a burden, for both in a more competitive and disruptive age. The transatlantic economy remains the most interconnected, robust, and resilient commercial artery in the world, as we explain in the following chapters.

Box 3. Supporting Ukraine

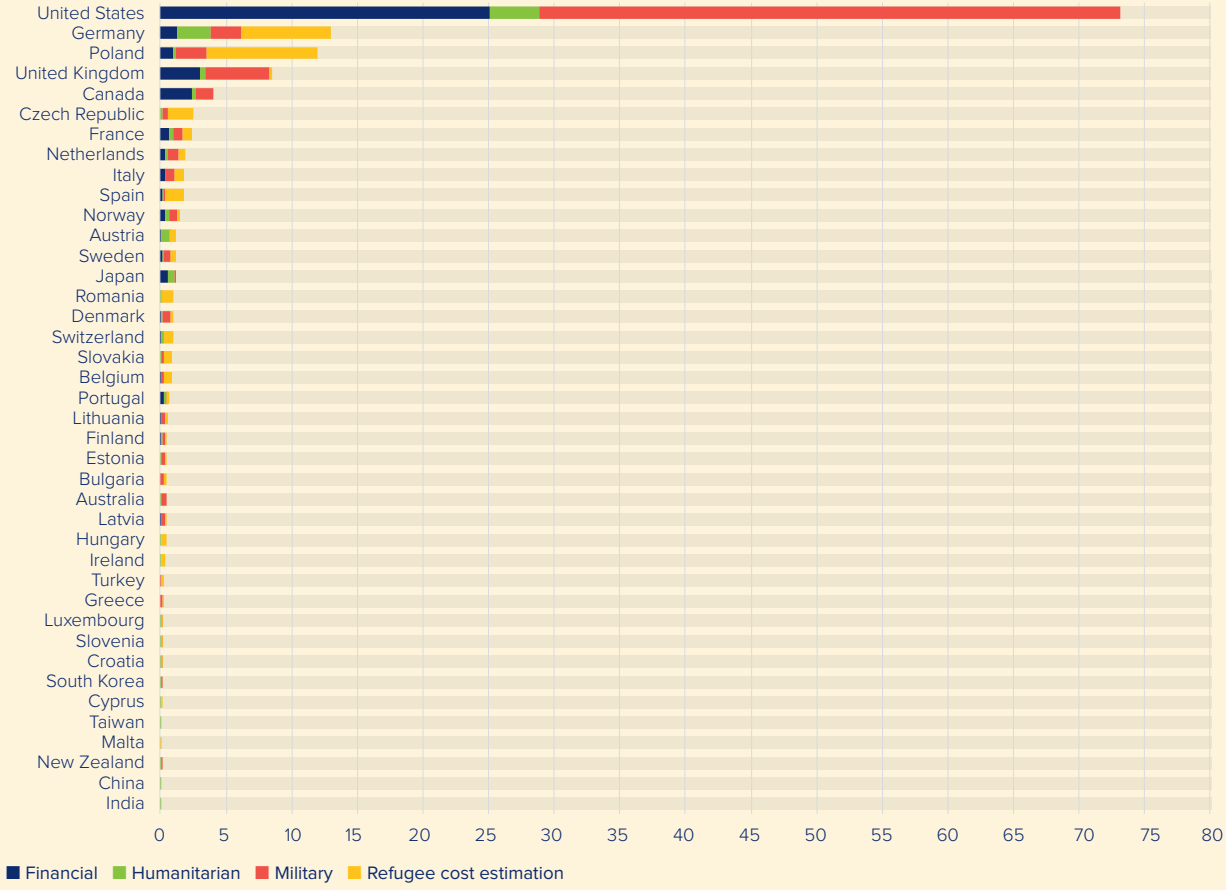
Russia's ongoing aggression against Ukraine has replaced the pandemic as the leading strain on global trade, according to BCG analysis. The war has not only devastated Ukraine, it has amplified global financial instabilities and supply chain distortions, wreaked havoc on food and energy markets, and generated the largest refugee crisis since World War II. Ending the war, says U.S. Treasury Secretary Janet Yellen, "is the single best thing we can do for the global economy".

The transatlantic partners have spearheaded international efforts to support Ukraine. During the one year between January 24, 2022 and January 15, 2023, €143 billion in government-to-government commitments were made to support Ukraine, according to the Kiel Institute for the World Economy. The United States has by far been the largest single bilateral supporter, having committed €73.18 billion, more than 50% of total commitments. The U.S. is not only the largest absolute donor, it is among the top donors as a share of national GDP.

Total EU commitments amounted to €54.92 billion – about 75% of the U.S. level and less than one tenth of the €570 billion that European governments spent to shield their own societies from the energy shocks generated by the war. Of the total, EU member states committed €19.9 billion bilaterally, €29.92 billion through the EU Commission and Council, €3.1 billion via the European Peace Facility, and €2 billion through the European Investment Bank.

If contributions via EU channels are reapportioned to the individual EU states that provided them, then the U.S. remains the largest individual donor (€73.18 billion), followed by Germany

Table 5. **Top 20 Donors to Ukraine, January 2022-January 2023: Total Bilateral Commitments plus Refugee Costs** (€Billions)



Includes bilateral commitments to Ukraine and cost estimates for refugees.
Refugee costs are taken from the OECD Migration Report 2022. Does not include private donations, and aid by international organiszations.
Source: Trebesch, et al.

(€13.33 billion), the UK (€8.31 billion), France (€7.66 billion), Italy (€5.44 billion), and Poland (€5.02 billion). In terms of bilateral commitments in percent of donor country GDP, the top five donors are Estonia, Latvia, Lithuania, Poland, and the United States.[10]

More than 10 million Ukrainians have fled their homes, almost 5 million of whom left the country. Poland is the leading host country, taking in over 1.56 million refugees. Germany is second (1.06 million), while the Czech Republic (486,133), Italy (169,306) and Spain (161,012) rank third, fourth, and fifth, respectively. In terms of share of population, Estonia tops the list (4.96%), the Czech Republic is second (4.54%), Moldova is third (4.15%) and Poland is fourth (4.12%).

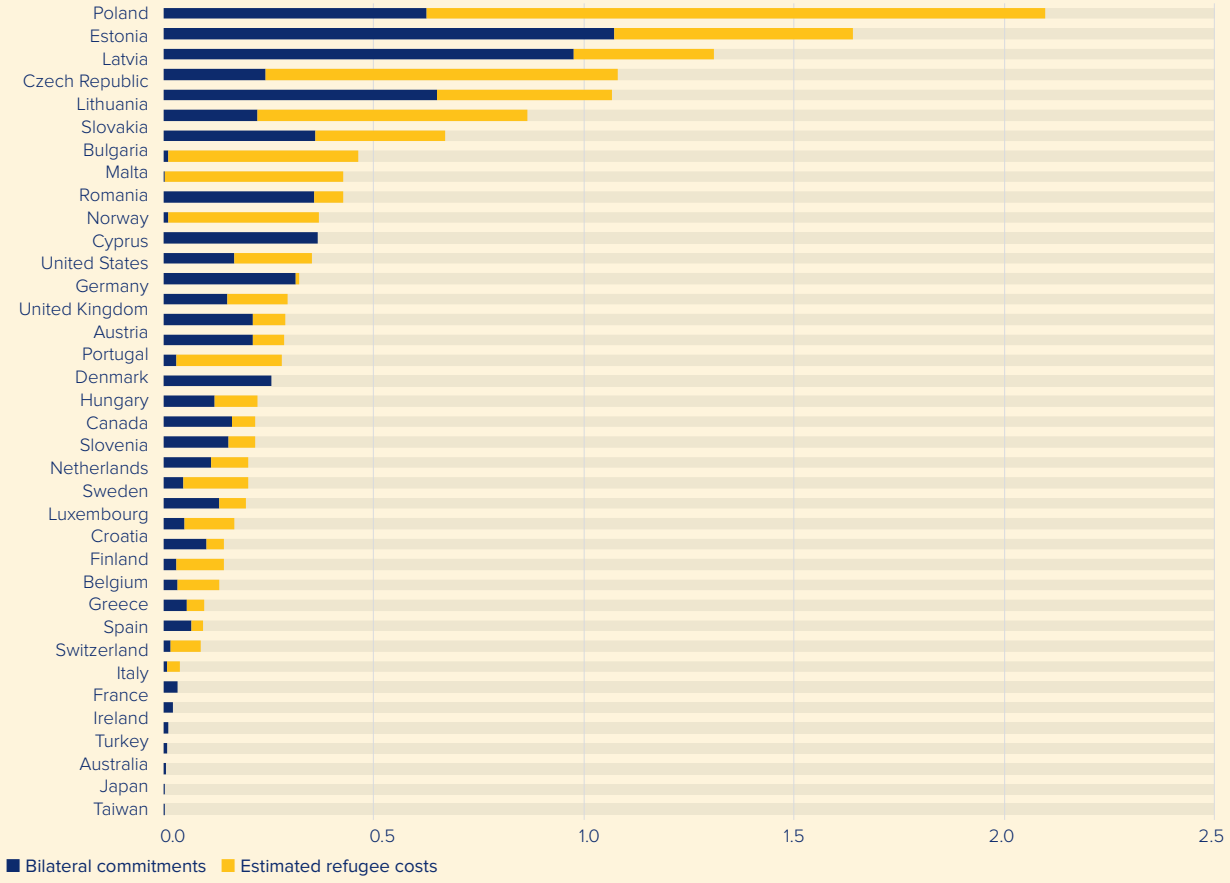
When the Kiel Institute adds estimated refugee costs to bilateral support levels, the United States remains in first place (€73.18 billion), followed by Germany with (€12.96 billion, incl. €6.81 billion in refugee costs) and Poland (€11.92 billion, incl. €8.36 billion in refugee costs).

In terms of financial commitments, the EU institutions lead (€30.32 billion), followed by the United States (€25.11 billion), but with an important difference: the EU sum consists almost exclusively of loans, whereas U.S. commitments are entirely grants that do not need to be repaid. As of January 15, 2023, only 48% of the committed financial aid had been disbursed.

The Kiel Institute reports €13.27 billion in additional financial aid by multilateral organizations like the IMF, World Bank, UN and the European Bank of Reconstruction and Development (EBRD).

The EBRD forecasts a rise in Ukraine's GDP of 1% in 2023, which would stabilize the country's real output at around 70% of its level before Russia's February 2022 invasion. The Bank predicts 3% growth in 2024.

Table 6. **Total Bilateral Commitments to Ukraine Plus Refugee Costs** (Percent of GDP)



Includes bilateral commitments to Ukraine and cost estimates for refugees.
Refugee costs are taken from the OECD Migration Report 2022. Does not include private donations, and aid by international organizations.
Source: Trebesch, et al.

Box 4. Sanctioning Russia

Russia's renewed invasion of Ukraine in 2022 prompted North America and Europe to expand drastically the sanctions they had already enacted following the Kremlin's 2014 interventions. The current sanctions, unprecedented in scope and scale, are intended to impose severe consequences on Moscow for its actions and to hamper its ability to sustain its war. More than $300 billion of Russian central bank assets and $22 billion of Russian oligarchs' money have been frozen. Travel bans and asset freezes have been imposed on over a thousand individuals and hundreds of entities. Most of the Russian financial sector has been disconnected from the SWIFT payments network. Exports of high-tech components and other materials critical to the Russian economy have been blocked, as have flights, shipping, maintenance and insurance services. Foreign investment has dried up. Broadcasting activities and licenses of several Kremlin-backed disinformation outlets have been banned in many countries. Additional sanctions have been imposed on Belarus, for its involvement in Russia's invasion, and on Iran over the supply of drones to Russia. Notably, the sanctions do not block the export of and transactions related to food and agricultural products.[11]

The U.S and Canada, which traditionally have had limited economic links with Russia, curtailed practically all commercial ties. Many European economies took similarly drastic action, despite their far deeper commercial relations with Russia. EU exports to Russia halved within weeks of the outbreak of war. Many imports were banned. However, a full and abrupt cutoff of commercial ties was difficult because many European countries had grown dependent on Russian energy. For that reason, prohibitions were introduced gradually on Russian energy imports.[12]

One year on, Europe has accomplished the truly remarkable. It has largely weaned itself off Russian energy. Gas demand fell by more than 20% between August and December 2022, thanks to efficiency measures and lower energy use. Norway, the United States, Algeria, and Qatar stepped in to supply more gas. Five new floating LNG terminals were set up in record time, with more due to come online this year and next. By January 2023, the flow of Russian gas through pipelines to the EU+UK was almost 90% lower than a year earlier.[13] The EU has now banned imports of Russian coal and other solid fossil fuels, crude oil, and refined petroleum products, with limited exceptions. Adjustable price caps have been introduced on seaborne crude oil, petroleum oils and oils obtained from bituminous minerals which originate in or are exported from Russia. The intent is to curtail Russia's oil revenues while limiting price surges and mitigating adverse consequences on energy supplies to third countries.[14]

Impact on Russia

The short-term impact of these measures on Russia has been mixed. The pain points are numerous. Russian living standards have eroded. Observed inflation, or how the public views price increases, is at 16%, much higher than the 12% official figure. Ten percent of the Russian workforce is without consistent work, a level comparable to the years following the dissolution of the Soviet Union. The Russian central bank projected capital flight from Russia in 2022 to total $251 billion. Finished steel output fell by 7% and commercial car production is just a fourth of what it was a year ago. Russia's monthly budget revenues from oil and gas fell in January 2023 to their lowest level since 2020 – 46% below where they were a year earlier. Revenue from other sources was down by 20% in October 2022 from a year earlier, and was on a downward spiral. The Russian Finance Ministry has been forced to nearly triple its daily foreign currency sales to make up for the shortfall. Russia's 2022 budget deficit of $47 billion was its second highest deficit in the post-Soviet era. Moscow's weapons production capacity has been degraded, and it has been forced to turn to Iran for drones and drone parts, and to North Korea for artillery shells and rockets.[15]

In other respects, however, the Russian economy has weathered the situation better than expected. Russia's central bank avoided a catastrophic financial crisis by imposing capital controls and hiking interest rates. The IMF estimates that the Russian economy shrank 2.2% in 2022, far less than forecasts made a year ago. It expects the Russian economy to grow by 0.3% in 2023 and 2.1% in 2024.

Despite international sanctions, Moscow recorded a $227 billion current account surplus in 2022. It has diverted exports of energy and other key commodities to Asian, Middle Eastern, Latin American and African states. Imports initially crashed, but then stabilized as exporters from China, Hong Kong, and Turkey stepped in. China now accounts for over 36% of Russia's imports and 20% of its exports. China and Hong Kong now supply about 40% of Russia's chips – although the U.S. Treasury says that close to half of them are proving to be defective. Chinese state-owned defense companies have been shipping navigation equipment, jamming technology and jet-fighter parts to Russian defense companies. A significant shadow trade has emerged to circumvent the sanctions. And although many companies based in G7 countries had announced plans to leave the Russian market or abandon investments there, analysts estimate that no more than 15% have actually divested one of their Russian subsidiaries.[16]

As time wears on, however, Russian prospects look much bleaker. Bloomberg Economics estimates that Russia's economy is on track to lose $190 billion in GDP by 2026, relative to its prewar path. Heavy government spending on the war is bleeding the Kremlin's reserves. The ruble's seeming stability relies on unsustainably strict currency controls. Energy bans and price caps are having some effect: Moscow's tax income from oil and gas in January 2023 was among its lowest monthly totals since the pandemic depths of 2020. Moscow is still selling oil to countries like India and China, but mostly at steep discounts. By some estimates, Russia is set for a $100 billion loss in its oil exports receipts and a $50 billion loss in its gas export revenues in 2023. Moreover, its land-based energy infrastructure points west; it cannot easily switch out China and India for Europe. And it will be unable to maintain, let alone expand, its energy production without Western technology. Russian planes are flying only because those on the ground have been cannibalized for parts. Hundreds of thousands of talented and educated Russian professionals are leaving the country. In the end, this vast brain drain may prove to be the most crippling for Russia's economy and society.[17]

Notes

1 See Marc Gilbert, Nikolaus Lang, Georgia Mavropoulos, and Michael McAdoo, "Protectionism, Pandemic, War, and the Future of Trade," BCG, January 17, 2023, https://www.bcg.com/publications/2023/protectionism-pandemic-war-and-future-of-trade.
2 Uri Dadush, "The Future of Global Value Chains and the Role of the WTO," WTO Staff Working Paper ERSD-2022-11, August 2, 2022, https://www.policycenter.ma/sites/default/files/2022-08/ersd202211_e.pdf.
3 Lucas Kitzmüller, Helena Schweiger, Beata Javorcik, "The reshuffling of global supply chains is already happening," VoxEU/CEPR, November 24, 2022, https://cepr.org/voxeu/columns/reshuffling-global-supply-chains-already-happening.
4 Peter Foster, Andy Bounds and Jim Pickard, "How the Windsor framework changes Northern Ireland's trading arrangements," *Financial Times*, February 28, 2023.
5 *The Economist*, "Careful assembly required," January 5, 2023; John Springford, "The cost of Brexit to June 2022," Centre for European Reform, December 21, 2022; Office of Budget Responsibility, "Brexit analysis," last updated May 26, 2022, https://obr.uk/forecasts-in-depth/the-economy-forecast/brexit-analysis/.
6 AmCham EU, "Two years later: Brexit's impact on US companies in Europe," January 25, 2023, https://www.amchameu.eu/blog/two-years-later-brexit%E2%80%99s-impact-us-companies-europe.
7 UK Government, "UK trade in numbers," February 17, 2023, https://www.gov.uk/government/statistics/uk-trade-in-numbers/uk-trade-in-numbers-web-version.
8 Janet Bush, ed., "Global flows: The ties that bind in an interconnected world," McKinsey Global Institute, November 2022; Gabriel Felbermayr, Guntram Wolff, "How Europe can share changes in the world economy," *Internationale Politik Quarterly*, January 4, 2023, https://ip-quarterly.com/en/how-europe-can-shape-changes-world-economy.
9 Bush.
10 Christoph Trebesch, et al., The Ukraine Support Tracker, Kiel Institute for the World Economy, https://www.ifw-kiel.de/fileadmin/Dateiverwaltung/IfW-Publications/-ifw/Kiel_Working_Paper/2022/KWP_2218_Which_countries_help_Ukraine_and_how_/KWP_2218_Trebesch_et_al_Ukraine_Support_Tracker.pdf, last accessed February 21, 2023.
11 European Commission, "EU sanctions against Russia explained," https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/sanctions-against-russia-explained/#sanctions; Nicholas Mulder, "Sanctions Against Russia Ignore the Economic Challenges Facing Ukraine," *New York Times*, February 9, 2023.
12 Arnau Busquets Guardia and Charlie Cooper, "The delayed impact of the EU's wartime sanctions on Russia," *Politico*, February 2, 2023.
13 Georgi Kantchev and Joe Wallace, "Europe Cuts Addiction to Russian Energy, Yet Fuel Scramble Continues," *Wall Street Journal*, February 3, 2023.
14 Andrew Duehren, Laurence Norman and Joe Wallace, "G-7 Expands Sanctions on Russian Oil Industry," *Wall Street Journal*, February 3, 2023.
15 "Remarks by Deputy Treasury Secretary Wally Adeyemo on International Sanctions Against Russia," U.S. Treasury Department, February 21, 2023; Vladimir Milov, "The Sanctions on Russia Are Working," *Foreign Affairs*, January 18, 2023; *Politico* Weekly Trade, January 30, 2023.
16 Ademo; Douglas Busvine, "Western firms say they're quitting Russia. Where's the proof?," *Politico*, February 28, 2023; Jeffrey Sonnenfeld, et al., "The Russian Business Retreat - How the Ratings Measured Up One Year Later," SSRN, January 31, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4343547; Simon Evenett and Niccolò Pisani, "Less than Nine Percent of Western Firms Have Divested from Russia," SSRN, January 31, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4322502; "Macro note – China steps in to supply Russia," Institute of International Finance, February 1, 2023; Mulder; The Economist, "Dodged penalties," February 1, 2023; Naomi Garcia, "Trade Secrets: Exposing China-Russia Defense Trade in Global Supply Chains," C4ADS, July 15, 2022, https://c4ads.org/reports/trade-secrets/; Ian Talley and and Anthony DeBarros, "China Aids Russia's War in Ukraine, Data Shows," *Wall Street Journal*, February 4, 2023.
17 Ademo; Milov; Guardia and Cooper; Mulder; Georgi Kantchev and Paul Hannon, "Russia to Cut Oil Output, Sending Prices Higher," *Wall Street Journal*, February 10, 2023; Janis Kluge, "Russian oil and gas revenue in 2022," Twitter thread, February 2, 2023, https://twitter.com/jakluge/status/1621440460408365056.

2

Jobs, Trade and Investment: Enduring Ties that Bind

It has been a tumultuous decade for the global economy. In just over three years, the world has been stricken by a pandemic, stunned by a military conflict in the heart of Europe, and shaken by inflationary pressures reminiscent of the 1970s. Rarely have the challenges seemed so acute.

Compounding matters, familiar patterns of globalization are shifting. Even before Russia's further invasion of Ukraine in 2022, the world economy was being splintered by great power rivalries, weaponization of interdependencies, rising barriers to trade and investment, resource protectionism, and calls for firms to "reshore," "near-shore," or "friend-shore" production. The pandemic amplified these trends. Putin's war has sharpened them.

Share of world GDP

31%

U.S and EU27

31%

Regional Comprehensive Economic Partnership (RCEP)

Globalization isn't dead, but it is being refined and reconfigured. U.S. and European multinationals confront a more challenging environment. Firms are not deaf or blind to the shifting contours of globalization, and are increasingly focused on building more resiliency into their supply chains and securing critical inputs to production. But this doesn't mean they are turning their backs on the world. Instead, they are diversifying their sourcing and reinforcing the foundations of their success. Most are derisking rather than decoupling. And for many, the dense transatlantic linkages they have built over decades are an anchor in the storm.

The bottom line: in a world wracked by war, pandemics, soaring inflationary pressures, and the rising gale forces of de-globalization, the two sides of the North Atlantic remain deeply intertwined and embedded in each other's markets. This is not likely to change any time soon, given the deep and entangled commercial ties that link the transatlantic economy, and the fact that shareholders and stakeholders on both sides of the pond directly benefit from deep transatlantic integration. The fact that the United States and Europe are each embroiled in increasingly contentious commercial and geopolitical tensions with Russia and China also suggests transatlantic cooperation will endure. And the post-pandemic world of tighter energy supplies and tighter labor markets portends thicker transatlantic ties.

In a world wracked by war, pandemics, soaring inflationary pressures, and the rising gale forces of de-globalization, the two sides of the North Atlantic remain deeply intertwined and embedded in each other's markets.

Thanks to the dense interlinkages of investment, trade, technology, innovation and jobs that bind the two sides of the North Atlantic together, the transatlantic economy remains a central pillar of the global economy. The combined output of the United States and Europe accounted for roughly one-third of world GDP in terms of purchasing power parity in 2022. Excluding the UK, the EU27 and the United States account for a substantial 31% of world GDP – higher than the combined output of China and India (one-quarter of world GDP) and on par with the newly created combined output of the Regional Comprehensive Economic Partnership (RCEP) in Asia of 31% of GDP.

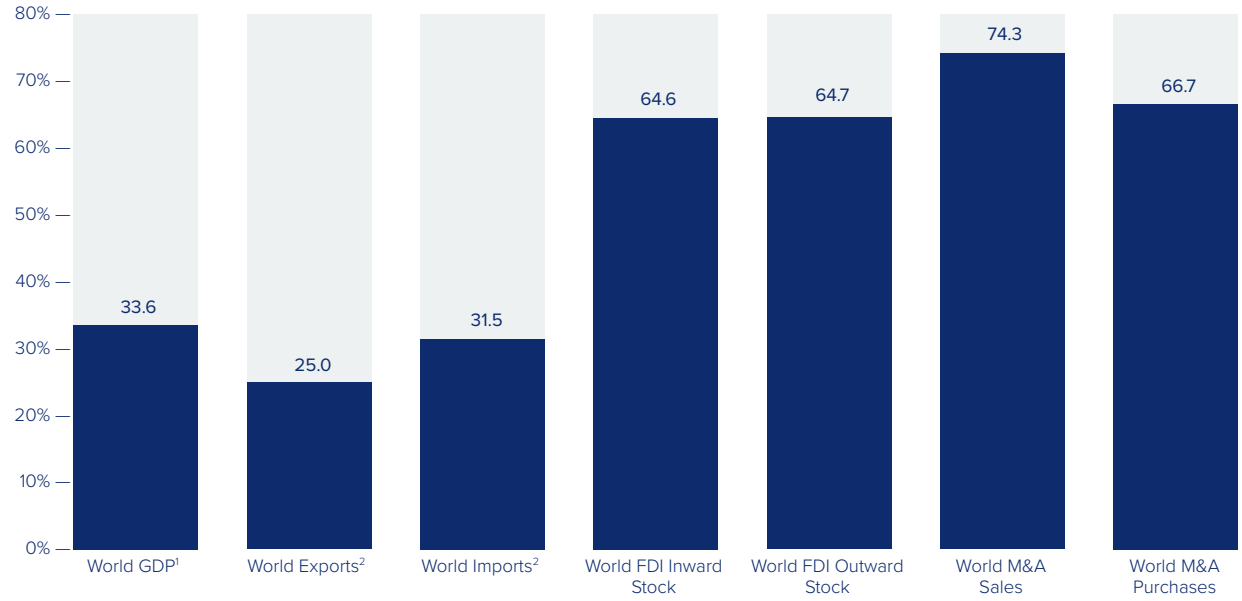
The transatlantic economy is not only larger than the twin giants of Asia but also significantly wealthier. And because wealth matters, it's little wonder that consumers in the United States and the EU easily outspend their counterparts in China and India. As mentioned in Chapter One, the two combined accounted for 51% of global personal consumption in 2021, the last year of available data, versus a combined share of just 16.4% for China and India. Per capita incomes – a key metric of a nation's wealth – matter and on this score, it's no contest. The United States (with an estimated per capita income of roughly $69,000 in purchasing power parity terms in 2021) and the European Union (est. $48,000) are far wealthier than China ($19,000) and India ($7,000).

In addition to the above, the transatlantic economy is a repository of innovation and technological advancement, and at the forefront of global foreign direct investment and global mergers and acquisitions (M&A) activity. Taken together, U.S. and European goods exports to the world (excluding intra-EU trade) accounted for 20% of global goods exports in 2021, the last year of complete data. But the two parties accounted for 66% of global inward stock of foreign direct investment and 66% of outward stock of FDI. Each partner has built up the great majority of that stock in the other economy. Mutual investment in the North Atlantic space is very large, dwarfs trade, and has become essential to U.S. and European jobs and prosperity. Over 70% of M&A purchases are by U.S. and European companies.

It is no surprise, therefore, that the largest commercial artery in the world stretches across the Atlantic. Total transatlantic foreign affiliate sales were estimated at $5.9 trillion in 2021, easily ranking as the most integrated commercial partnership on account of the thick investment ties between the two parties.

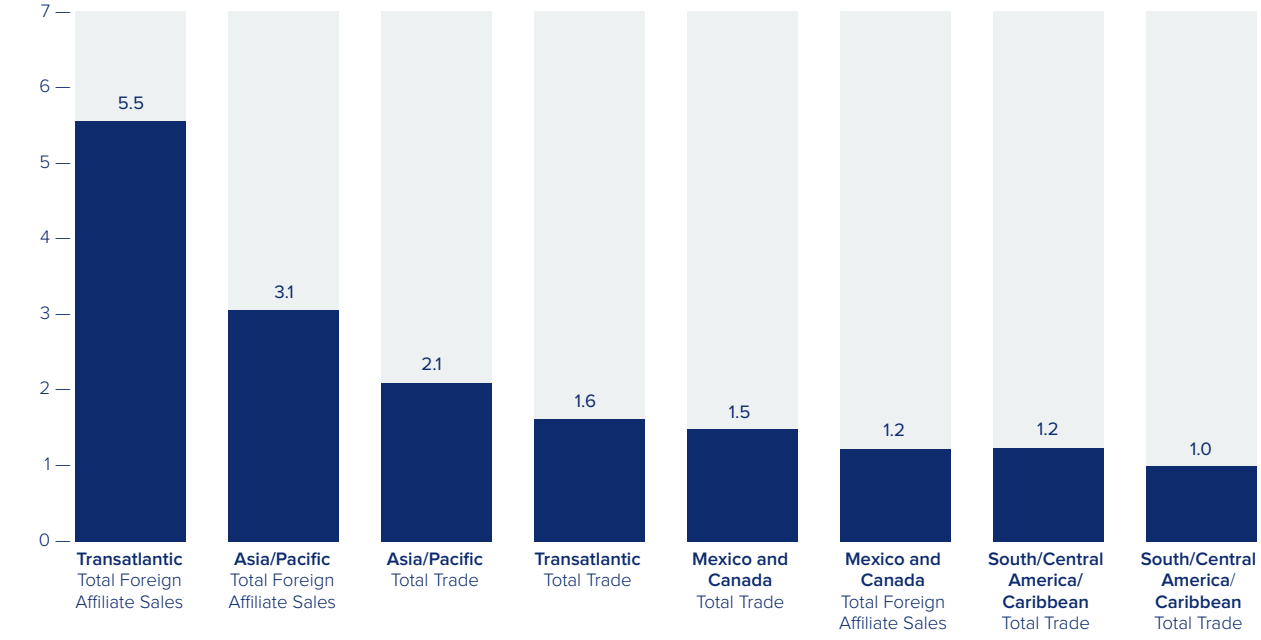
That said, the burgeoning middle class of the developing nations represents new sources of supply (labor) and demand (consumers) for U.S. and European firms. American and European companies are building out their in-country presence in the developing nations, and for good reason. Economic growth rates are still above the global average in most nations, populated with young consumers who desire Western goods and services. In addition, the technological skill levels of many developing nations are now on par with many developing nations. China, for instance, is

Table 1. The Transatlantic Economy vs the World (Share of World Total)



Sources: UN, IMF, figures for 2021. Transatlantic economy measured as U.S., EU, UK, Norway, Switzerland and Iceland.
1. Based on PPP estimates.
2. Excluding intra-EU, UK, Norway, Switzerland and Iceland trade.

Table 2. America's Major Commercial Arteries ($Trillions)



Foreign Affiliate Sales: Author's estimates for 2021. Total Trade: Data for goods & services, 2021. South/Central America and Caribbean includes Mexico.
Source: Bureau of Economic Analysis.

For many U.S. and European companies, the transatlantic economy is the geo-economic base from which they can engage successfully in other parts of the world.

rapidly emerging as an innovation superpower; India lags behind but is advancing; more people in Latin America, Africa and the Middle East are online and connected to the global digital economy. It all makes perfect sense for U.S. and European firms to invest outside the transatlantic economy.

What is often missing from this either/or picture, however, is the fact that for many U.S. and European companies, the transatlantic economy is the geo-economic base from which they can engage successfully in other parts of the world. Many European car companies, for instance, invest in the United States and then export cars made in the U.S.A. to China and other countries. U.S. services companies, in turn, use the scale offered by their dense investment linkages across the transatlantic economy to be globally competitive when it comes to offering services in other parts of the world. Many U.S. multinationals – for both goods and services – also use their presence in Europe to serve the markets of North Africa and the Middle East and beyond.

In all of these ways, the transatlantic partnership remains important not only to the United States and Europe, but also to the world. The U.S.-European partnership is too big and too important to fail, as made all too clear when dissecting the activities of foreign affiliates on both sides of the pond.

The Ties That Bind – Quantifying the Transatlantic Economy

Total output of foreign affiliates
(2021 estimate)
$670 billion
U.S. in Europe

US affiliate output
(2020)
$383 billion
Asia-Pacific

We have long made the case that when it comes to global commerce, traditional trade statistics are incomplete and misguided metrics when measuring the level of global engagement between two parties. Global commerce beats to the tune of foreign direct investment and affiliate sales, not cross-border trade. Hence, as we outline and emphasize each year in this survey, it is the activities of foreign affiliates – the foot soldiers of the transatlantic partnership – that bind the United States and Europe together. Investment, not trade, drives U.S.-European commerce. Understanding this dynamic is essential to understanding the enduring strength and importance of the transatlantic economy.

Over the past years, we have outlined and examined eight key indices that offer a clear picture of the "deep integration" forces binding the U.S. and Europe together. This chapter updates those indices with the latest available data and our estimates. Each metric, in general, has ebbed and flowed with cyclical swings in transatlantic economic activity, but has nevertheless grown in size and importance over the past decade.

1. Gross Product of Foreign Affiliates

As standalone entities, U.S. affiliates in Europe and European affiliates in the United States are among the largest and most advanced economic forces in the world. The total output, for instance, of U.S. foreign affiliates in Europe (an estimated $670 billion in 2021) and of European foreign affiliates in the United States (estimated at $665 billion) was greater than the total gross domestic product of most countries. Combined, transatlantic affiliate output – more than $1.3 trillion – was larger than the total output of such countries as Mexico, the Netherlands, or Indonesia.

By our estimation, affiliate output rebounded modestly in 2021 from the depressed levels of 2020, when transatlantic activity came to a near standstill due to the pandemic. European affiliate output in the United States rose modestly by 2%, while U.S. affiliate output in Europe rose roughly 4%. European affiliates in the United States are operating in one of the most dynamic economies in the world and are expected to boost their near-term output again this year. And even though Europe is being challenged by the disruptions generated by the war, the eurozone economy actually grew faster than the U.S. or Chinese economy in 2022. This brighter economic outlook, amidst indications that Europe is likely to pivot successfully away from its energy dependencies on Russia, bodes well for firms in both the U.S. and Europe.

On a global basis, the aggregate output of U.S. foreign affiliates was around $1.4 trillion in 2021, with Europe (broadly defined) accounting for around half of the total. According to the Bureau of Economic Analysis, U.S. affiliate output in Europe ($643 billion) in 2020 was 73% greater than affiliate output in the entire Asia-Pacific region ($383 billion).

In the United States, meanwhile, European affiliates are major economic producers in their own right, with British and German firms of notable importance.

The U.S. output of British companies was $150 billion in 2020, the last year of actual data. That represents about one-quarter of the European total. For the same year, output from German affiliates operating in the United States totaled $114 billion, or nearly 20% of the European total. Off the back of strong U.S. economic growth in 2021, we estimate that output of both British and German affiliates in the U.S. rose by 5%, with the former totaling an estimated $158 billion in 2021, and the latter $120 billion.

In 2020, the last year of available data, European affiliates in the United States accounted for nearly 61% of the roughly $1.1 trillion that affiliates of foreign multinationals contributed overall to U.S. aggregate production.

Beyond Europe, only Canadian and Japanese investors have any real economic presence in the United States. Japanese affiliate output totaled nearly $152 billion in 2020, the last year of complete data, while Canadian affiliate output totaled $112 billion. Foreign direct investment from China had soared in the United States over the past few years, but from a relatively low base, and now is plummeting due to bilateral commercial tensions and tighter U.S. scrutiny of such investments. Chinese affiliate output in the U.S. totaled just $14 billion in 2020, less than that of Sweden ($21 billion).

2. Assets of Foreign Affiliates

The global footprint of corporate America and corporate Europe is second to none, with each party each other's largest foreign investor. According to the latest figures from the Bureau of Economic Analysis, U.S. foreign assets in Europe totaled $18.7 trillion in 2020, representing roughly 63% of the global total.

For 2021, we estimate that U.S. foreign assets in Europe rose modestly, by 2%, to $19 trillion as the continent emerged from the pandemic. The bulk of U.S. assets in Europe was in the United Kingdom: $6.2 trillion in 2020, the last year of available data, or around 21% of the global total.

U.S. assets in the Netherlands (around $3.1 trillion) were the second largest in Europe in 2020. America's significant presence in the Netherlands reflects its strategic role as an export platform/ distribution hub for U.S. firms doing business across the continent. To this point, more than half of U.S. affiliate sales in the Netherlands are for export, particularly within the EU.

Beyond Europe, only Canada and Japan have a significant economic presence in the United States.

Meanwhile, America's asset base in Germany topped $1.1 trillion in 2020, more than a third larger than its asset base in all of South America. America's asset base in Poland, the Czech Republic and Hungary (roughly $234 billion) was greater than corporate America's assets in South Korea ($182 billion). America's assets in Ireland ($2 trillion in 2020) were light years ahead of those in China ($487 billion).

Europe's stakes in the United States are also sizable and significant. Total assets of European affiliates in the United States were valued at roughly $8.3 trillion in 2020. The United Kingdom ranked first, followed by Germany, Switzerland, and French firms. In 2020, the last year of available data, European assets in the United States accounted for over 51% of all foreign-owned assets in the United States. We estimate that European-owned assets in the United States rose modestly in 2021 to $8.4 trillion.

3. Affiliate Employment

U.S. and European foreign affiliates are a major source of employment for the general transatlantic workforce. Indeed, on a global basis, affiliates of both U.S. and European parents employ more workers in the United States and Europe than in other places in the world. Most foreign workers on the payrolls of U.S. foreign affiliates are employed in the developed nations, notably Europe.

U.S. foreign affiliate employment in Europe has increased steadily since the turn of the century, with affiliate employment in Europe rising from 3.7 million workers in 2000 to 4.8 million workers in 2020, the last full year of available data. That represents a near 33% increase. We estimate that U.S. foreign affiliates in Europe employed 4.8 million workers in 2021, unchanged from the prior year.

While aggregate employment levels continue to rise modestly, manufacturing employment has plateaued since 2000. U.S affiliate manufacturing employment totaled 1.9 million in 2000, nearly on par with the levels of 2020 (1.8 million) However, while the overall number has stayed roughly the

U.S. foreign assets in Europe (2020)
$18.7 trillion

63%
of total U.S. foreign assets globally

U.S. foreign affiliate employment in Europe
(2021 estimate)
4.8 million workers

European foreign affiliate employment in the U.S.
(2021 estimate)
5 million workers

same, the country composition has changed, with more investment shifting to lower-cost locales like Poland and Hungary versus high-cost economies like Germany and France. The largest employment declines were reported in the United Kingdom, with the total U.S. affiliate manufacturing workforce falling from 431,000 in 2000 to 283,000 in 2020. U.S. manufacturing employment in France dropped from 249,000 to 178,000, while a smaller decline from 388,000 to 358,000 was reported in Germany between 2000 and 2020. In terms of net gains in manufacturing jobs, Poland has been a significant winner, with U.S. affiliate manufacturing employment growing almost three times, from 51,000 in 2000 to over 138,000 in 2020.

Roughly 34% of all manufacturing workers employed by U.S. foreign affiliates outside the United States in 2020 were based in Europe.

Table 3. Transatlantic Jobs
(Thousands of Employees, 2021*)

Country	U.S. Companies in Europe	European Companies in the U.S.
Austria	29.2	32.5
Belgium	118.3	76.1
Czech Republic	75.1	3.8
Denmark	37.5	46.9
Finland	21.4	36.3
France	487.9	754.9
Germany	653.0	902.8
Greece	16.9	3.8
Hungary	59.2	0.3
Ireland	151.2	343.2
Italy	246.8	100.7
Luxembourg	24.7	40.3
Netherlands	242.7	580.7
Norway	37.9	7.9
Poland	214.0	1.1
Portugal	33.1	0.8
Romania	85.2	< 0.05
Spain	187.7	95.0
Sweden	62.4	221.6
Switzerland	96.6	496.7
United Kingdom	1,512.7	1,242.0
Europe	**4,803.0**	**5,008.5**

Source: Bureau of Economic Analysis.
**2021 estimates. Majority-owned bank and non-bank affiliates.*

On a global basis, U.S. majority-owned affiliates (including banks and non-bank affiliates) employed 14 million workers in 2020, with the bulk of these workers – roughly 34% – toiling in Europe. That share is down from 41% in 2009. That decline is in part a consequence of Europe's cyclical slowdown for some years, and in part due to the fact that U.S. overseas capacity is expanding at a faster pace in faster-growing emerging markets than slower-growth developed nations. Another factor at work: more and more U.S. firms are opting to stay home due to competitive wage and energy costs, as opposed to shipping more capacity abroad. The sweeping overhaul of the U.S. corporate tax code in 2017, which significantly lowered America's tax rate relative to many in Europe, has spurred more investment to come home or stay in the United States. Other incentives include new subsidies for semiconductor, clean energy and infrastructure production. More on those in Chapter Six. That said, however, with the U.S. labor market at its tightest in decades, U.S. firms are even more dependent on European workers to drive production and sales.

Most employees of U.S. affiliates in Europe live in the UK, Germany, and France. Meanwhile, U.S. majority-owned firms are on balance hiring more people in services activities than in manufacturing. The latter accounted for 38% of total U.S. foreign affiliate employment in Europe in 2020. The key industry in terms of manufacturing employment was transportation equipment, with U.S. affiliates employing nearly 336,000 workers, followed by chemicals (257,000). Wholesale employment was among the largest sources of services-related employment, which includes employment in such activities as logistics, trade, insurance and other related functions.

Although services employment among U.S. affiliates has grown at a faster pace than manufacturing employment over the past decade, according to our estimates U.S. affiliates employed more manufacturing workers in Europe in 2021 (1.9 million) than in 1990 (1.6 million). This reflects the EU enlargement process, and hence greater access to more manufacturing workers, and the premium U.S. firms place on highly skilled manufacturing workers, with Europe one of the largest sources in the world.

When it comes to affiliate employment, trends in the United States are similar to those in Europe. Despite stories on the continent about local European companies relocating to lower cost locales in eastern Europe and Asia, most foreign workers of European firms are employed in the United States. Based on the latest figures,

European majority-owned foreign affiliates directly employed 4.9 million U.S. workers in 2020. We estimate the number to have reached 5 million in 2021. The top five European employers in the United States were firms from the UK (1.2 million jobs), Germany (885,000), France (740,000), the Netherlands (569,000) and Switzerland (487,000). European firms employed roughly two-thirds of all U.S. workers on the payrolls of majority-owned foreign affiliates in 2020.

In the aggregate, the transatlantic workforce directly employed by U.S. and European foreign affiliates in pandemic year 2020 was roughly 9.7 million strong – 300,000 more than the year before. Employment levels rebounded again in 2021, to an estimated 9.8 million, and are expected to have increased further in 2022.

One reminder: as we have stressed in the past, these figures understate the employment effects of mutual investment flows, since these numbers are limited to direct employment, and do not account for indirect employment effects on nonequity arrangements such as strategic alliances, joint ventures, and other deals. Moreover, foreign employment figures do not include jobs supported by transatlantic trade flows. Trade-related employment is sizable in many U.S. states and many European nations. In the end, direct and indirect employment remains quite large. We estimate that the transatlantic workforce numbers some 14-16 million workers, counting both direct affiliate employees as well as those whose jobs are supported by transatlantic trade. Europe is by far the most important source of "onshored" jobs in America, and the United States is by far the most important source of "onshored" jobs in Europe.

4. Research and Development (R&D) of Foreign Affiliates

The United States and Europe remain primary drivers of global R&D. Yet as the globalization of R&D has gathered pace, more and more global R&D expenditures are emanating from Asia in general and China in particular. Beijing is unrelentingly focused on being a global leader in artificial intelligence, quantum computing, space exploration, cyber security, life sciences, electric vehicles, supercomputing, semiconductors and 5G wireless devices. Beijing's long-term goal is to become an "international innovation leader" by 2030 and a "world powerhouse of scientific and technological innovation" by 2050.

While governments and corporations are the main drivers of R&D spending, foreign affiliates of multinationals are also in the thick of things. In fact, foreign affiliate R&D has become more prominent over the past decades as firms seek to share development costs, spread risks, and tap into the intellectual talent of other nations. Alliances, cross-licensing of intellectual property, mergers and acquisitions, and other forms of cooperation have become more prevalent characteristics of the transatlantic economy. The digital economy has become a powerful engine of greater transatlantic R&D. The complexity of scientific and technological innovation is leading innovators to partner and share costs, find complementary expertise, gain access to different technologies and knowledge quickly, and collaborate as part of "open" innovation networks. Cross-border collaboration with foreign partners can range from a simple one-way transmission of information to highly interactive and formal arrangements. Developing new products, creating new processes, and driving more innovation – all of these activities result from more collaboration between foreign suppliers and U.S. and European firms. And all of this collaboration, regardless of sector or industry, is dependent on the ability to transfer data across borders, as we discuss in Chapter 5.

The United States and Europe remain primary drivers of global R&D.

Bilateral U.S.-EU flows in R&D are the most intense between any two international partners. In 2020, the last year of available data, U.S. affiliates spent $31.6 billion on research and development in Europe. On a global basis, Europe accounted for roughly 54% of total U.S. R&D in 2020. R&D expenditures by U.S. affiliates were the greatest in the United Kingdom ($6.0 billion), Germany ($5.7 billion), Switzerland ($5.5 billion), Ireland ($4.0 billion), Belgium ($2.2 billion) and France ($1.9 billion). These six countries accounted for nearly 80% of U.S. spending on R&D in Europe in 2020.

In the United States, meanwhile, expenditures on R&D performed by majority-owned foreign affiliates totaled $71.4 billion in 2020. As in previous years, a sizable share of this R&D spending emanated from world-class leaders from Europe, given their interest in America's highly skilled labor force and world-class university system. Most of this investment by European firms took place in such research-intensive sectors as autos, energy, chemicals, and

R&D spending of foreign affiliates (2020)

$31.6 billion

U.S. in Europe

$71.4 billion

Europe in the U.S.

Table 4. Top 20 R&D Spenders

		R&D Spending			
Rank	Company	2021 ($Billions)	Change from 2020 (%)	Country	Industry
1	Alphabet	27.9	6.0	U.S.	Software & Computer Services
2	Meta	21.8	6.7	U.S.	Software & Computer Services
3	Microsoft	21.6	7.5	U.S.	Software & Computer Services
4	Huawei Investment & Holding	19.5	5.1	China	Technology Hardware & Equipment
5	Apple	19.3	15.6	U.S.	Technology Hardware & Equipment
6	Samsung Electronics	16.8	35.6	South Korea	Electronic & Electrical Equipment
7	Volkswagen	15.6	-2.9	Germany	Automobiles & Parts
8	Intel	13.4	3.9	U.S.	Technology Hardware & Equipment
9	Roche	13.3	1.5	Switzerland	Pharmaceuticals & Biotechnology
10	Johnson & Johnson	13.0	7.1	U.S.	Pharmaceuticals & Biotechnology
11	Pfizer	10.2	-1.3	U.S.	Pharmaceuticals & Biotechnology
12	Bristol-Myers Squibb	9.3	-12.3	U.S.	Pharmaceuticals & Biotechnology
13	Merck US	9.1	70.9	U.S.	Pharmaceuticals & Biotechnology
14	Mercedes-Benz	9.0	10.5	Germany	Automobiles & Parts
15	Toyota Motor	8.7	16.1	Japan	Automobiles & Parts
16	Novartis	8.0	36.9	Switzerland	Pharmaceuticals & Biotechnology
17	Alibaba Group Holding	7.7	32.9	China	Software & Computer Services
18	Tencent	7.2	0.7	China	Software & Computer Services
19	ASTRAZENECA	7.1	-2.2	UK	Pharmaceuticals & Biotechnology
20	General Motors	7.0	-5.5	U.S.	Automobiles & Parts
		265.5	**17.9**		

Source: The 2021 EU Industrial R&D Investment Scoreboard. Data as of December 2021.
Note: Only companies that disclose their R&D figures according to the Scoreboard methodology can be included in the ranking. Excluded from the ranking is Amazon which, according to the Scoreboard, would be positioned at #1 in the world R&D ranking if it had separated its R&D and content investments in its annual report.

telecommunications. In 2020, R&D spending by European affiliates accounted for $47.8 billion, or 67%, of total foreign R&D spending in the United States.

On a country basis, German-owned affiliates were the largest foreign source of R&D in the United States in 2020, spending some $12.7 billion, or 26% of the total of European R&D. Swiss firms ranked second, with $10.2 billion, or 21.5% of the total, followed by British firms, $6.6 billion or 13.5% of the total. As Table 4 highlights, almost all of the world's most innovative companies are domiciled in the United States or Europe.

5. Intra-firm Trade of Foreign Affiliates

While cross-border trade is a secondary means of delivery for goods and services across the Atlantic, the modes of delivery – affiliate sales and trade – should not be viewed independently. They are more complements than substitutes, since foreign investment and affiliate sales increasingly drive cross- border trade flows. Indeed, a substantial share of transatlantic trade is considered intra-firm or related- party trade, which is cross-border trade that stays within the ambit of the company. Intra-firm or related party-trade occurs when BMW or Siemens of Germany sends parts to BMW of South Carolina or Siemens of North Carolina; when Lafarge or Michelin send intermediate components to their Midwest plants, or when General Motors or 3M ships components from Detroit, Michigan or St. Paul, Minnesota to affiliates in Germany or the UK. All of these examples are at the core of interconnected global supply chains.

Table 5. **Related-Party Trade** (2020)

Country	U.S. Imports: "Related Party Trade" as % of Total	U.S. Exports: "Related Party Trade" as % of Total
European Union (incl. UK)	65	39
Germany	69	38
France	47	35
Ireland	85	38
Netherlands	74	58
UK	54	31

Source: U.S. Census Bureau.
Data as of January 2022.

The tight linkages between European parent companies and their U.S. affiliates are reflected in the fact that roughly 65% of U.S. imports from the European Union consisted of intra-firm trade in 2020, the last year of available data. That is much higher than the intra-firm imports from Pacific Rim nations (around 40%) and well above the global average (48%). The percentage was even higher in the case of Ireland (85%) and Germany (69%).

Meanwhile, 39% of U.S. exports to the EU plus UK in 2020 represented intra-firm trade, but the percentage is much higher for some countries. For instance, more than half of total U.S. exports to the Netherlands (58%) was classified as related-party trade. The comparable figure for Germany was 38% and for France it was 35%.

6. Foreign Affiliate Sales

U.S. majority-owned foreign affiliate sales on a global basis (goods and services) totaled an estimated $6.5 trillion in 2021. Total U.S. exports, in contrast, were $2.5 trillion in 2021, or roughly 39% of foreign affiliate sales. This gap underscores the primacy of foreign affiliate sales over U.S. exports. As we have noted many times before, one of the best kept secrets in Washington is how U.S. firms actually deliver goods and services to foreign customers.

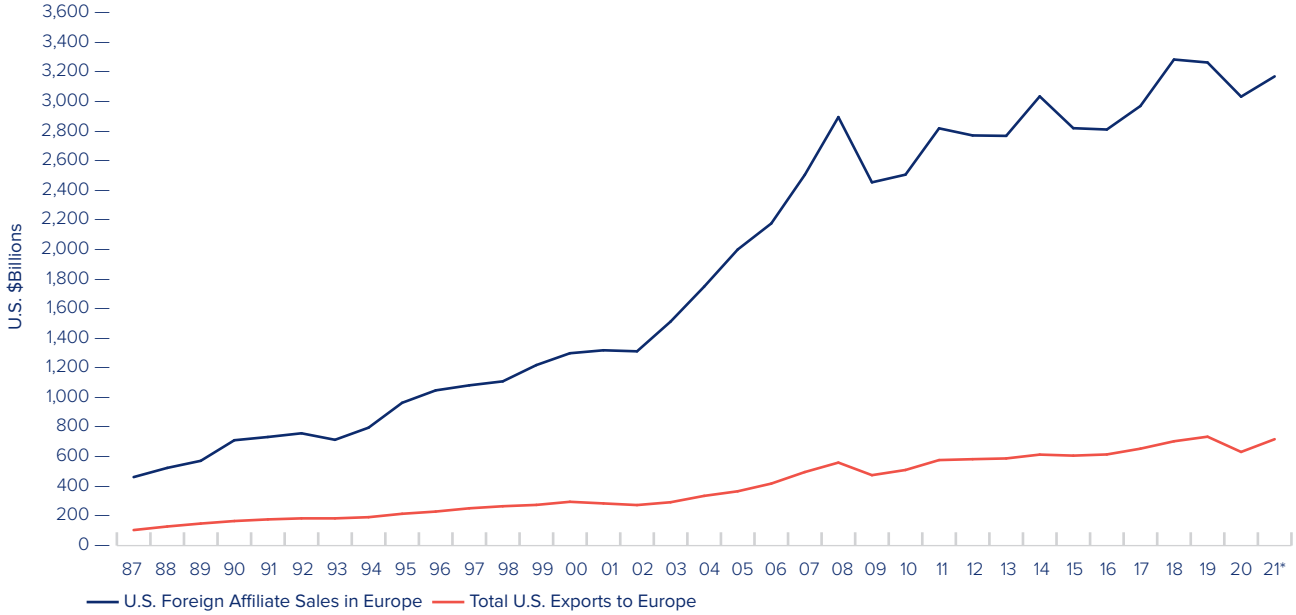
As usual, Europe accounted for the bulk of U.S. affiliate sales in 2021. We estimate that U.S. foreign affiliate sales in Europe totaled $3.1 trillion; U.S. affiliate sales in Europe, by our estimates, amounted for roughly half of the global total.

Reflecting the primacy of Europe when it comes to U.S. foreign affiliate sales, sales of U.S. affiliates in Europe were roughly 70% larger than the comparable figures for the entire Asian region in 2020, the last full year of available data. Affiliate sales in the United Kingdom ($649 billion) were double total sales in South America. Sales in Germany ($343 billion) were roughly double combined sales in Africa and the Middle East.

Affiliate sales are also the primary means by which European firms deliver goods and services to customers in the United States. In 2021, for instance, we estimate that majority-owned European affiliate sales in the United States ($2.7 trillion) were more than triple U.S. imports from Europe. By country, sales of British firms were the largest ($555 billion) in 2020, followed by Germany ($554 billion), and the Netherlands ($315 billion). For virtually all countries in Europe, foreign affiliate sales were easily in excess of their U.S. imports in 2021.

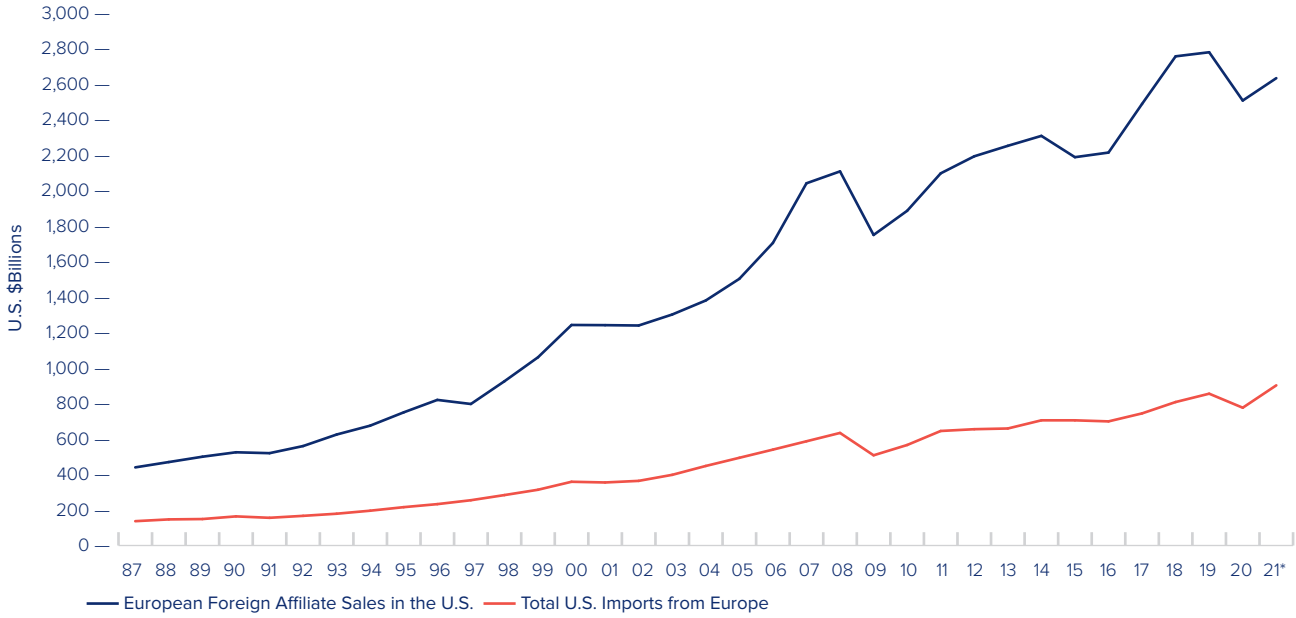
Foreign affiliate sales
(2021 estimate)
$3.1 trillion
U.S. in Europe
$2.7 trillion
Europe in the U.S.

Table 6. Sales of U.S. Affiliates in Europe vs U.S. Exports to Europe



Source: Bureau of Economic Analysis.
Majority-owned non-bank affiliates data: 1987 - 2008. Majority-owned bank and non-bank affiliates: 2009 - 2021.
**Foreign Affiliate Sales: Estimates for 2021.*

Table 7. Sales of European Affiliates in the U.S. vs U.S. Imports from Europe



Source: Bureau of Economic Analysis
Majority-owned non-bank affiliates: 1987 - 2006. Majority-owned bank and non-bank affiliates: 2007 - 2021.
**Foreign Affiliate Sales: Estimates for 2021.*

7. Foreign Affiliate Profits

As we outlined in Chapter 1, transatlantic profits rebounded strongly in 2021 from the depressed levels of 2020, and remained robust again in 2022. By our estimates (based on three quarters' worth of data), U.S. affiliate income in Europe rose to a record $325 billion in 2022, while European affiliate income in the United States reached $151 billion – the second highest level in history. It was another solid year for profits – notwithstanding the tumult ripping through the global economy. As the key source of foreign profits for U.S. firms, the EU accounted for nearly 56% of U.S. global foreign affiliate income in the first nine months of 2021.

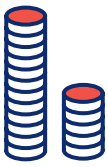
On comparative basis, U.S. affiliate income from Europe is simply staggering: $239 billion in the first nine months of 2022, about 2.7 times more than U.S. affiliate income in all of Asia ($84 billion). As a reminder, we define Europe here in very broad terms, including not only the EU27 but also the United Kingdom, Norway, Switzerland, Russia and smaller markets in Central and Eastern Europe.

It is interesting to note that combined U.S. affiliate income from China and India in 2021 ($17.9 billion), the last year of full data, was a fraction of what U.S. affiliates earned/reported in the Netherlands, the United Kingdom and Ireland.

Transatlantic profits rebounded strongly in 2021 from the depressed levels of 2020, and remained robust again in 2022.

Still, there is little doubt that the likes of China, India and Brazil are becoming more important earnings engines for U.S. firms. To this point, in the first nine months of 2022, U.S. affiliate income in China alone ($9.0 billion) was in excess of affiliate income in Germany ($8.6 billion), France ($2.9 billion), and Spain ($1.8 billion). U.S. affiliates in India earned $5.8 billion in the January-September period, well more than that earned in many European countries.

All that said, we see rising U.S. affiliate earnings from the emerging markets as a complement, not a substitute, to earnings from Europe. The latter very much remains a key source of prosperity for corporate America. Similarly, the United States remains the most important market in the world in terms of earnings for many European firms.



Foreign affiliate profits (2022 estimate)

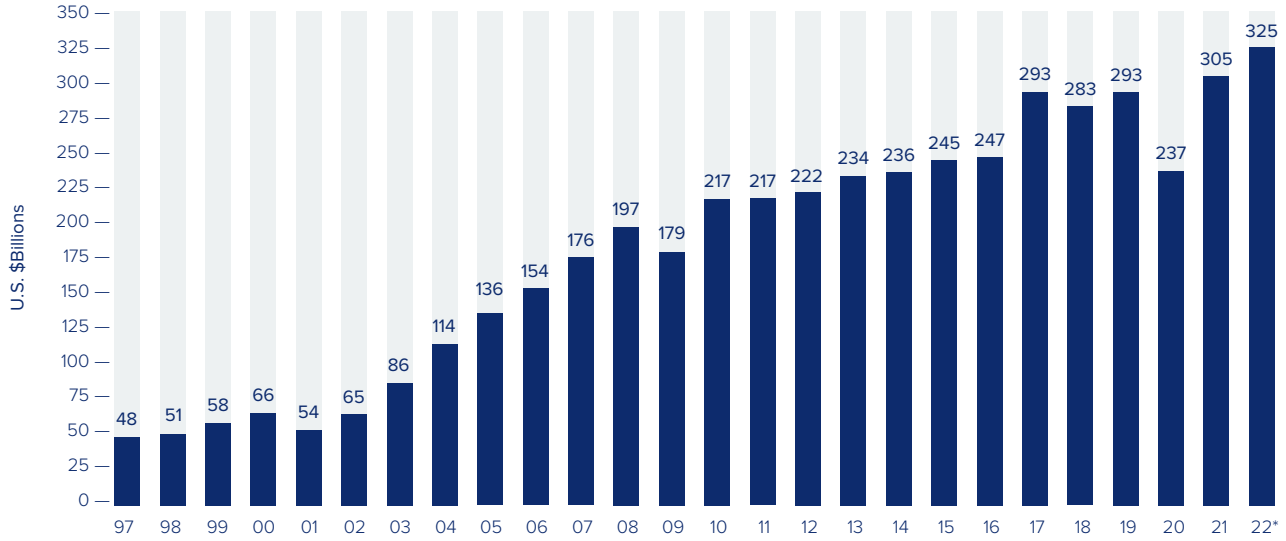
$325 billion

U.S. in Europe

$151 billion

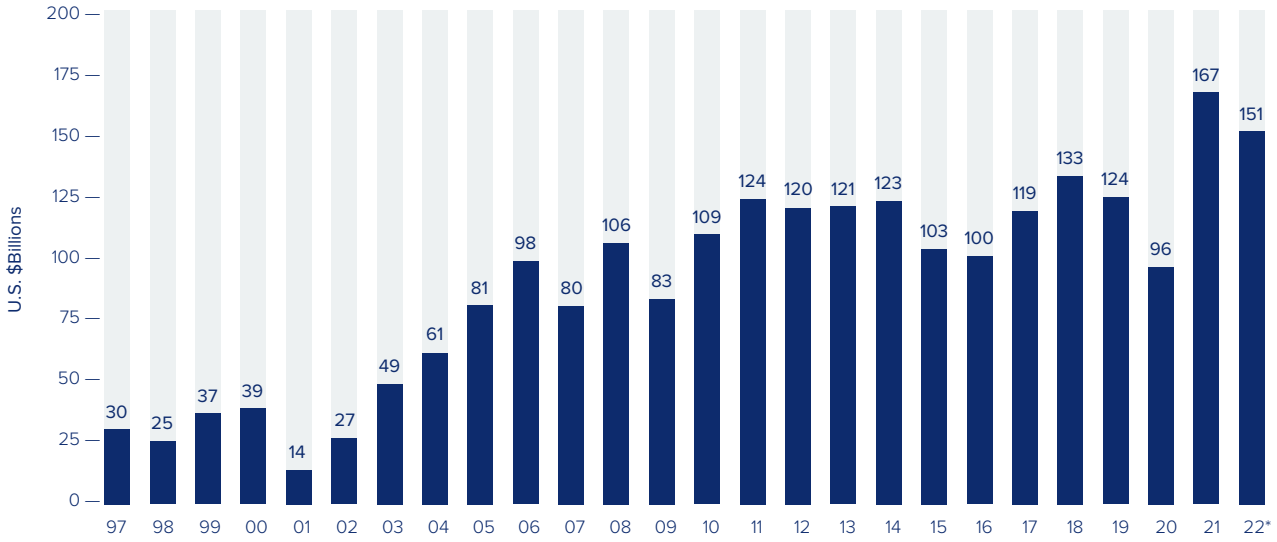
Europe in the U.S.

Table 8. U.S. Earnings in Europe Rebound to New Highs



Source: Bureau of Economic Analysis.
**Data for 2022 is annualized using 3 quarters of 2022 data.*

Table 9. Historic Highs: European Affiliate Earnings in the U.S.



Source: Bureau of Economic Analysis.
**Data for 2022 is annualized using 3 quarters of 2022 data.*

8. Transatlantic Services

The United States and Europe are the largest services economies in the world. They are each other's largest services market, which means that when an exogenous shock like Covid-19 strikes, transatlantic services activities are most vulnerable. The pandemic battered numerous U.S.-European services activities in 2020, but transatlantic services markets rebounded robustly in 2021.

U.S. services exports to Europe totaled $332 billion in 2021, a sharp rise from the depressed levels of the year before. The UK remains the largest market for U.S. services exports and the largest source of U.S. services imports.

U.S. services imports from Europe also rebounded in 2021, rising to $230 billion, up from $197 billion the year before. Against this backdrop, the U.S. services surplus with, after falling to $94 billion in 2020, rose to $101 billion in 2021. This compares to a $219 billion trade deficit in goods for the same year. On a regional basis, Europe accounted for 41% of total U.S. services exports in 2021 and for 42% of total U.S. services imports.
Five out of the top ten export markets for U.S. services in 2021 were in Europe. Ireland ranked first, followed by the United Kingdom (2nd), Switzerland (3rd), Germany (7th), and the Netherlands (10th). Of the top ten services providers to the United States in 2021, five were European states, with the UK ranking first, Germany second, Switzerland sixth, Ireland seventh, and France tenth.

Trade figures, while significant, do not do full justice to the importance of the transatlantic services economy. Transatlantic foreign affiliate sales of services are much deeper and thicker than traditional trade figures suggest. Indeed, sales of affiliates have exploded on both sides of the Atlantic over the past few decades thanks to falling communication costs and the rise of the digital economy. Affiliate sales of services have not only supplemented trade in services, they have become the overwhelming mode of delivery in a rather short period of time. Worldwide affiliate sales of U.S. services almost doubled from 2005 to 2020, the last year of available data, totaling $1.6 trillion, a slight decline from the year before.

Sales of services of U.S. foreign affiliates in Europe totaled $977 billion, or 56% of the global total in 2020. U.S. services exports to Europe in the same year totaled $332 billion, well below sales of services by affiliates. In other words, like goods, U.S. firms primarily deliver services in Europe (and vice versa) via their foreign affiliates rather than by trade.

Table 10. Top Markets for U.S. Services Trade ($Billions, 2021)

U.S. Services Exports

Rank	Total Services		Travel		Other Business		Financial		IP Charges		Transport		Telecom/Info Svcs	
1	UK	67.8	Mexico	11.5	Singapore	19.7	UK	22.5	China	8.8	South Korea	5.3	Canada	7.1
2	Canada	56.1	China	10.9	Canada	18.3	Canada	9.9	Canada	7.6	Japan	5.2	UK	6.1
3	China	39.5	India	7.6	UK	17.2	Luxembourg	6.8	UK	6.0	Germany	4.8	Japan	4.1
4	Japan	36.9	Canada	3.0	Netherlands	11.8	Japan	5.4	Japan	5.9	Canada	4.7	Germany	3.1
5	Germany	32.0	South Korea	2.0	Germany	10.9	China	4.5	Germany	5.3	China	3.3	Brazil	2.6
6	Mexico	30.5	UK	1.7	Japan	9.3	Germany	4.3	Netherlands	4.8	UK	3.1	Singapore	2.5
7	Singapore	30.1	Brazil	1.4	China	5.6	Australia	4.1	Singapore	4.2	Mexico	2.9	Australia	2.5
8	Netherlands	23.8	Argentina	1.0	Mexico	5.2	Netherlands	3.4	Hong Kong	4.1	France	2.8	Mexico	2.1
9	South Korea	19.2	Germany	0.9	France	4.5	Hong Kong	3.2	South Korea	4.0	Taiwan	2.2	China	1.9
10	India	18.5	Taiwan	0.8	Hong Kong	3.6	Mexico	3.1	Mexico	3.5	Brazil	1.9	Netherlands	1.7
	Total	**795.3**	**Total**	**70.2**	**Total**	**217.4**	**Total**	**171.7**	**Total**	**124.6**	**Total**	**65.8**	**Total**	**59.8**

U.S. Services Imports

Rank	Total Services		Travel		Other Business		Financial		IP Charges		Transport		Telecom/Info Svcs	
1	UK	61.1	Mexico	16.0	UK	18.4	UK	15.8	Japan	8.0	Japan	9.3	India	11.8
2	Germany	34.7	UK	2.1	India	12.7	Canada	2.9	Germany	5.8	China	8.5	Canada	6.1
3	Canada	33.1	Italy	1.6	Canada	9.9	Hong Kong	2.4	UK	4.6	Taiwan	8.0	UK	4.2
4	Japan	31.1	Canada	1.5	Germany	8.9	Japan	2.2	France	2.7	Germany	7.3	Netherlands	1.3
5	India	28.8	France	1.4	China	8.7	Singapore	1.9	Netherlands	2.2	France	7.2	Germany	1.0
6	Mexico	27.8	Germany	1.2	Singapore	4.8	France	1.6	Canada	1.6	Canada	5.7	Mexico	0.7
7	China	21.5	India	1.1	Mexico	4.3	China	1.3	India	1.6	South Korea	5.4	Japan	0.7
8	France	18.4	Netherlands	0.5	Netherlands	4.0	Germany	1.2	China	0.5	Mexico	4.8	China	0.5
9	South Korea	12.3	Japan	0.4	France	3.2	Australia	1.1	Australia	0.5	Hong Kong	4.0	Korea	0.4
10	Netherlands	12.2	Brazil	0.4	Japan	3.1	Brazil	0.9	Singapore	0.5	UK	3.3	France	0.4
	Total	**550.0**	**Total**	**56.9**	**Total**	**129.6**	**Total**	**49.5**	**Total**	**43.3**	**Total**	**105.3**	**Total**	**43.1**

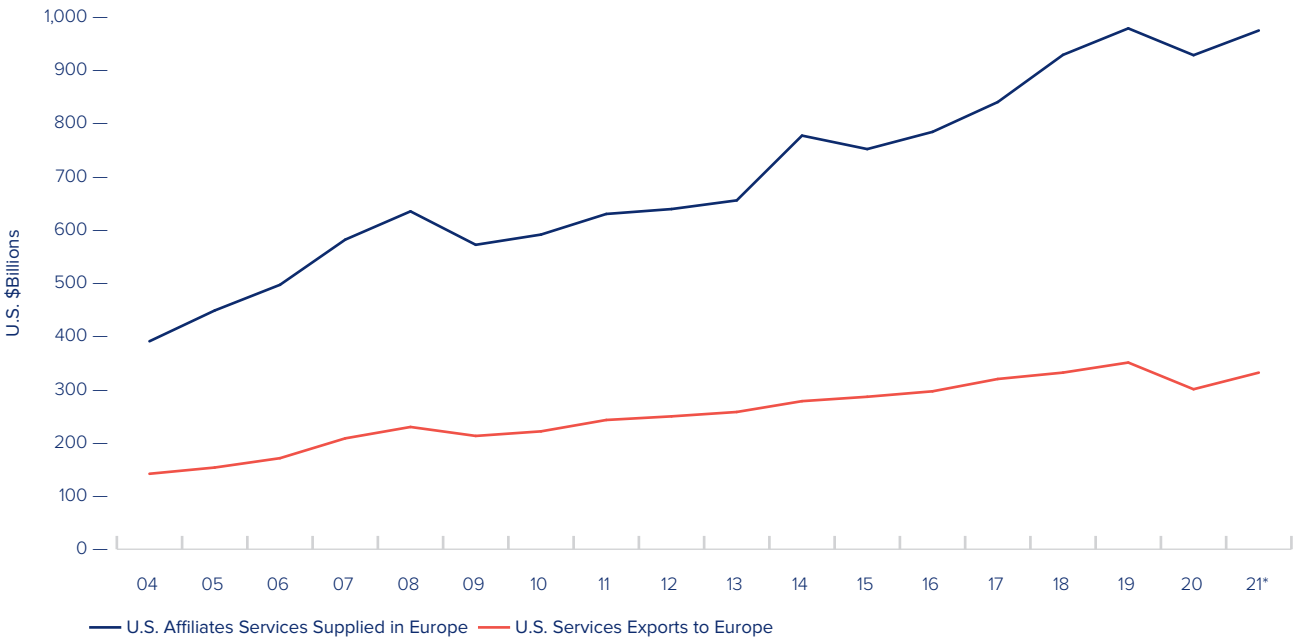
Source: Bureau of Economic Analysis.
Data as of January 2023.

According to the U.S. Bureau of Economic Analysis, services by U.S. companies based in the UK and UK firms based in the U.S. totaled $435.4 billion in 2020. That's 3.4 times greater than U.S.-UK overall trade in services of $116.3 billion. The contrast is even greater in terms of U.S.-German commercial ties: services by US companies based in Germany and German firms based in the U.S. totaled $252.1 billion. That's 4.1 times U.S.-German services trade of $61.4 billion.

The UK accounted for roughly 30% ($274 billion) of all U.S. affiliate services sales in Europe – more than combined U.S. affiliate sales in Latin America and the Caribbean ($158 billion), Africa ($15 billion) and the Middle East ($26 billion). Affiliate sales in Ireland remain quite large – $172 billion – and reflect strong U.S-Irish foreign investment ties, underlined by the presence of several leading U.S. internet, software and social media leaders.

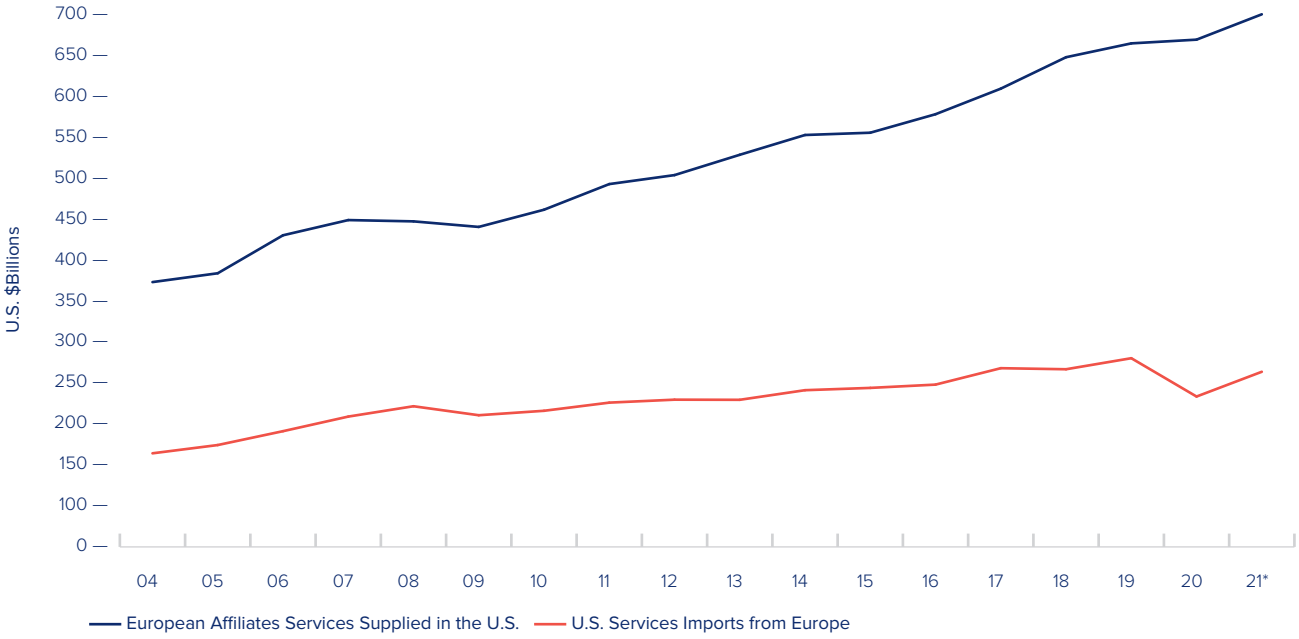
The United States and Europe are the largest services economies in the world.

Table 11. U.S.-Europe Services Linkages



Source: Bureau of Economic Analysis.
*Majority-owned bank and non-bank affiliates. *Services supplied in Europe estimates for 2021.*

Table 12. Europe-U.S. Services Linkages



Source: Bureau of Economic Analysis.
*Majority-owned bank and non-bank affiliates. *Services supplied in the U.S. estimates for 2021.*

U.S. affiliate sales of services in Europe continue to exceed sales of services by U.S. affiliates of European firms. In 2020, the last year of complete data, European affiliate services sales in the United States totaled $666 billion, about one-third below comparable sales of U.S. affiliates in Europe. That said, European affiliates are the key provider of affiliate services in the United States. Germany affiliates lead in terms of affiliate sales of services in the United States ($170 billion), followed closely by British affiliates ($161 billion). We estimate that European affiliate services sales in the United States rose modestly in to around $680 billion in 2021, after falling the year before due to the pandemic-induced recession. That's well above U.S. services imports from Europe ($197 billion) in 2021. The difference between affiliate sales of services and services imports reflects the ever-widening presence of European service leaders in the U.S. economy.

In the end, the United States and Europe owe a good part of their competitive position in services globally to deep transatlantic connections in services industries provided by mutual investment flows. A good share of U.S. services exports to the world are generated by European companies based in the United States, just as a good share of European services exports to the world are generated by U.S. companies based in Europe.

Foreign direct investment and foreign affiliate sales, not trade, represent the backbone of the transatlantic economy.

These eight indices convey a more complex and complete picture of U.S.-European engagement than trade figures alone. Transatlantic commerce goes well beyond trade. Foreign direct investment and foreign affiliate sales, not trade, represent the backbone of the transatlantic economy.

Table 13a. U.S. FDI Roots in Europe

Industry	U.S. FDI to Europe ($Billions)	Europe's % of Total U.S. FDI
European Total, all industries	3,981	61
Manufacturing	476	52

Table 13b. Europe's FDI Roots in the U.S

Industry	U.S. FDI from Europe ($Billions)	Europe's % of Total U.S. FDI
Total from Europe, all industries	3,186	64
Manufacturing	1,552	74

Note: Historic-cost basis, 2021.
Source: Bureau of Economic Analysis.

3

Decoupling, Derisking and Diversifying: Rethinking Russia, China and Global Supply Chains

Geopolitical tensions, economic disruptions, and ongoing pandemic shocks have forced countries and companies alike to take a hard look at vulnerabilities and dependencies they had acquired during the go-go years of hyper-globalization. North Americans and Europeans are reconsidering their regional and global supplier networks. They are adopting new approaches to protect their societies and promote their competitiveness. And they are spearheading an unprecedented effort to support Ukraine and punish Russia for its horrific war, as we discuss in Chapter 1.

While Russia's aggression is creating headline disruptions, the deeper rethink centers around China, given U.S. and European concerns about inordinate dependencies on another potent strategic rival, and the country's far greater importance as a critical node in global supply chains.

Strategic sectors with vulnerable supply chains for both the U.S. and the EU

How Dependent Are Europe and the United States on China?

In 2021, the European Commission and the United States published reviews of their respective supply chains, identifying dependencies and policies that could mitigate potential vulnerabilities.[1] Each identified semiconductors, pharmaceuticals, batteries and critical materials as strategic sectors with vulnerable supply chains due to highly concentrated reliance on a small number of suppliers. The EU report identified heightened import dependencies on China (52%), Vietnam (11%), and Brazil (5%); the U.S. report highlighted heavy reliance on China, in terms of both supply and demand. Tables 1 and 2 track common U.S./EU dependencies vis-à-vis the rest of the world and China in particular.

Table 1. EU and U.S. Dependencies on China and the Rest of the World

	Number of Dependent products	Potential for Diversification				Share in Total Import Value
		Low	*Medium*	*Medium-High*	*High*	
U.S./EU Dependencies on China	20	61%	9%	9%	21%	EU: 2.8% U.S.: 4.1%
U.S./EU Dependencies on Rest of the World	70	25%	8%	22%	45%	EU: 4.6% U.S.: 5.1%

Source: Sources: European Commission; United States Government; Ganyi Zhang, "EU-US: Public policies take up the challenges of the supply chain," Upply, July 23 2021, https://market-insights.upply.com/en/eu-us-public-policies-take-up-the-challenges-of-the-supply-chain.

Table 2. EU and U.S. Mutual Dependencies on China and the Rest of the World: Examples by Sector

	Health	Critical Materials	Renewables	Digital/ICT
U.S./EU Dependencies on China	APIs; Covid-19 related goods (face masks, gloves)	Tungstates, ferro-alloys, etc.	Permanent magnets	Laptops, cell phones, radio-broadcast receivers
U.S./EU Dependencies on Rest of the World	APIs; Covid-19 related goods (face masks, gloves)	Various	Permanent magnets Type electric accumulators	Laptops, cell phones, radio-broadcast receivers

Source: European Commission; United States Government; Zhang.

The U.S. and the EU are particularly focused on their inordinate dependence on China for many critical materials, and products needed for the green and digital transitions, such as permanent magnets, electric accumulators, cell phones, and radio broadcast receivers. When it comes to rare earths, for example, China accounts for 98% of EU imports and 80% of U.S. imports. In photovoltaics, China accounts for 97% of global wafer production, 80% of worldwide polysilicon, cells and modules production, and 70% of solar panel manufacturing. About four-fifths of wind-turbine components are manufactured in China.[2]

Beijing's massive state subsidies for Chinese firms in many of these areas have priced U.S. and European companies out of the market, and it has sometimes used its exports of these materials as a trade weapon. In addition, through its Belt and Road Initiative, China is locking in lower standards for carbon content in products among a wide swath of countries across Eurasia and Africa, while the U.S. and the EU struggle to scale up higher-standard infrastructure initiatives.[3]

Washington and Brussels have turned to their Trade and Technology Council (TTC) to facilitate joint efforts to enhance the resiliency and robustness of their respective supply chains, especially in highly-vulnerable ecosystems. Areas of shared concern beyond critical materials include Covid-related goods and active pharmaceutical ingredients (APIs, including vitamins, antibiotics, and hormones), semiconductors, ICT and cloud technologies, artificial intelligence, and defense-related technologies.

Such efforts notwithstanding, specific dependencies stand out. For example, despite growing transatlantic consensus that equipment provided by companies owned and affiliated with the Chinese government and military can pose significant security risks, Chinese vendors account for more than 50% of the 5G radio access networking technologies deployed in 8 notable European countries. Huawei enjoys a greater market share in Berlin than in Beijing.[4]

Western Companies in the China Market

Most Western companies are in China because they seek to expand their presence in the Chinese domestic market, not because China is a cog in their extended global supply chains. China now accounts for a quarter of global sales

Washington and Brussels have turned to their Trade and Technology Council (TTC) to facilitate joint efforts to enhance the resiliency and robustness of their respective supply chains, especially in highly-vulnerable ecosystems.

of clothes, nearly a third of jewelry and handbags, and around two-fifths of cars, plus a significant share of packaged food, beauty products, pharmaceuticals, electronics and more. It is the world's largest market for machine tools and chemicals, and its construction industry is the largest buyer of building equipment.[5]

The Chinese market's overall importance to the U.S., Japanese or European economies, however, is less than generally suggested. For all listed U.S. firms, China accounts for just 4% of sales, according to Morgan Stanley. For Japanese and European companies, the figures are 6% and 8% respectively.[6]

The situation is different for specific sectors and individual companies. The top 200 U.S., European and Japanese companies that disclose sales in China earned $700 billion there in 2021, or about 13% of their global sales, up from $368 billion, or 9% of sales, in 2017. Of that total, 30% was generated by technology-hardware firms, 26% by consumer-facing businesses, and 22% by industrial companies, with carmakers and commodity businesses also important. Thirteen multinationals reported over $10 billion of revenue a year in China, including Apple, BMW, Intel, Siemens, Tesla and Walmart. In 2022 China accounted for 25% of Tesla's global sales; 22% of Volkswagen China's global revenue; and similar percentages for Apple (19%) and Nike (18%).[7]

For many companies, however, the trend is negative; non-Chinese companies have lost share in 14 of 20 industries with sizable multinational presence over the past three years.[8] Indigenous Chinese firms are becoming more competitive, rules governing foreign companies have tightened, aid from the Chinese state is more targeted, and geopolitical challenges are mounting.

Share of rare earths imports from China

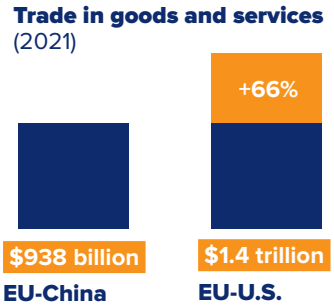
98%
EU
80%
U.S.

Goods Trade

China remains a powerhouse in goods trade. China's share of global goods exports by value increased over the course of the pandemic, to 15% by the end of 2021, from 13% in 2019, while the U.S. share slipped to 7.9% from 8.6%, Germany's share shrank to 7.3% from 7.8%, and Japan's share declined to 3.4% from 3.7%. China's gains in higher-end manufactured products are eating into the global market share of countries such as Germany, which traditionally excels at making and exporting such products. State-subsidized Chinese firms are also making inroads in more technology-intensive areas that have been strengths for U.S. and various European countries.[9]

China accounted for 10.2% of overall EU exports in 2021, behind both the United States (18.3%) and the UK (13%), according to Eurostat. EU imports of goods from China totaled $558 billion in 2021, a more than eight-fold increase from 2000. However, China only accounted for 8.6% of EU total imports for the year ($6.5 trillion). Meanwhile, the EU accounted for 15.4% of China's goods exports in 2021. That figure is down from the levels of 2007 to 2010.

European countries have very different types of commercial relationships with China. For instance, southern and eastern European countries primarily import high-tech goods from China and export raw materials, agricultural products and low-tech goods back to China. The pattern is different for Germany, France, the UK, and other northern and western European countries, which tend to export high-tech goods in exchange for critical materials and lower-end consumer products, although China's share of higher-end exports to these countries is growing. Germany is one of China's largest goods trading partners, and both German goods exports and imports to and from China have surged in past decades. However, Eurostat reports that the percentages are relatively modest as a share of either country's global total of goods exports and imports.



U.S. goods trade with China also remains sizable, despite official efforts to curtail it. U.S. imports of goods from China totaled $536.8 billion in 2022, a 6.3% increase from the prior year and close to the record $538.5 billion reached in 2018. U.S. goods exports to China grew 1.6% to $153.8 billion last year, pushing total goods trade between the two countries to a record $690.6 billion.[10]

No, China is Not Your Top Commercial Partner

These numbers have reinforced a fairly widespread view that China has become the top commercial partner of the United States and of Europe. This is incorrect, for many reasons.

First, just sticking with trade in goods: U.S.-Europe trade in goods reached an all-time high of $1.2 trillion last year. U.S.-EU trade in goods in 2022 – a record $909.45 billion – exceeded EU-China goods trade of $897.36 billion and was 25% higher than U.S.-China goods trade of $690.56 billion.

U.S.-China trade may have grown to record numbers, but higher U.S. growth in goods trade with other regions meant that China's share of U.S. goods imports actually fell to 16.5% in 2022 from 21.6% in 2017, while the share of the rest of Asia jumped to 24.8% from 20.9%. The EU+UK accounted for 19% of U.S. goods imports in 2022, roughly the same as in 2017, and greater than China's share.[11]

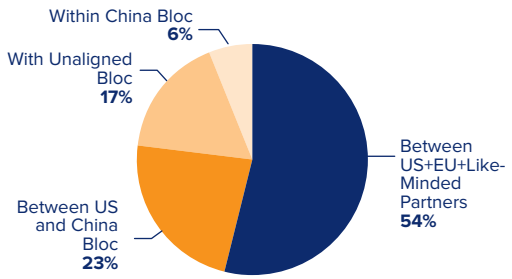
These trends could continue as ongoing disruptions redraw the global trade map. BCG projects that by the end of 2031 U.S.-China goods trade could decrease by $63 billion and EU-China goods trade grow by just $72 billion. This contrasts with BCG's forecast that U.S.-EU goods trade will grow by $338 billion, and that the U.S. and the EU will each expand goods trade considerably with ASEAN countries, Africa, the Middle East, and India.[12]

In fact, U.S.-China goods trade links have been weakening for more than 15 years. If one looks at mutual exports standardized by GDP of the exporting country, China's goods exports reliance on the U.S. peaked in 2005, and that of the U.S. on China, in 2017. Levels in 2020 were at 28% and 82% of their respective highs. Looking at mutual exports standardized by GDP of the importing country, China's reliance on U.S. goods imports peaked in 2006, and U.S. reliance on Chinese goods imports, in 2014. 2020 levels were at 48% and 78% of their respective highs.[13]

Second, many commentators wrongly equate international commerce only with trade in goods. Trade between countries, however, doesn't just consist of trade in goods. It also includes trade in services, which most media accounts do not include. Services trade has been growing faster than goods trade. More European and American jobs depend on services than on goods, and the United States and the EU remain by far each other's top services trade partner. EU27 services trade with the U.S. of $702.12 billion in 2021 was 6 times EU-China services trade of $115.54 billion.[14]

Putting goods and services together, EU-US trade totaled $1.413 trillion in 2021. EU-China trade in goods and services of $938 billion was only 66% as large. In short, if you look at overall trade flows and not just one kind of flow, it is clear that the largest trading partner for the EU is actually the United States, and the largest trading partner for the United States is the EU, as it has been for decades. And while China's global trade is rising, it still accounts for only 6% of global trade. Most trade still happens between the U.S., Europe and like-minded partners, according to Capital Economics (Table 3).

Table 3. **Global share of goods and services trade** (%)



Sources: Capital Economics; Neil Shearing, "World economy is fracturing, not deglobalizing," Chatham House, February 8, 2023, https://www.chathamhouse.org/2023/02/world-economy-fracturing-not-deglobalizing.

The Two-Lane Highway vs. the Twelve-Lane *Autobahn*

Moreover, just as trade is more than just flows of goods, international commerce is more than just trade. Reducing complex commercial ties to just trade in goods and services ignores the importance of a host of additional economic ties that bind Europe and the United States in far deeper ways than those that bind either to China.[15]

U.S. and European commercial ties with China are each akin to a two-lane highway, whereas their commercial ties with each other are more like a twelve-lane *Autobahn*.

The largest trading partner for the EU is actually the United States, and the largest trading partner for the United States is the EU.

The highways to and from China are full of goods. They are busy, and they are crowded. Any type of accident on a two-lane highway can really snarl traffic – as we saw when supply chains were disrupted by the pandemic and throughout the U.S.-China tariff dispute.

Alongside the China goods highway is another lane for trade in services, but that remains narrow, as we discussed earlier.

A further lane for investment has been under construction for some years, but it continues to face many roadblocks, as U.S. and European officials sanction China for human rights abuses, express security concerns about Chinese investments, tighten investment screening and export control procedures, and as each side of the Atlantic unveils new laws and directives aimed at boosting its respective competitiveness with China. China's onerous restrictions on foreign ownership, forced technology transfer rules, opaque and politically-influenced regulatory procedures, and its own sanctions on Western officials and legislators all serve to further dampen inward investment flows. The EU-China Comprehensive Investment Agreement (CAI), inked in December 2020, remains in the deep freeze. Investment by foreign companies in China tumbled to its lowest level in 18 years in the second half of last year. [16]

U.S-European investment lanes, in contrast, drive a huge amount of transatlantic commerce. The U.S. accounted for almost 25% of the EU27's total outward FDI position globally in 2020 – 10 times more than China, which accounted for less than 2.5% of the total. Total European stock in the United States of $3.2 trillion in 2021 was more than three times the level of comparable investment from all of Asia. Germany's total FDI stock in the United States totaled $403 billion in 2021. Chinese FDI stock in the United States was less than one-tenth of that total ($38 billion).

Europe's role vis-à-vis the United States is very similar. Measured on an historic cost basis, the

U.S. and European commercial ties with China are each akin to a two-lane highway, whereas their commercial ties with each other are more like a twelve-lane *Autobahn*.

total stock of U.S. FDI in Europe was $4 trillion in 2021 – just over 61% of America's total global investment position and more than four times U.S. investment in the Asia-Pacific region. U.S. FDI in the UK alone in 2021 was over eight times more than such investment in China.

When flows from holding companies are removed, Europe still accounted for over half of total U.S. FDI outflows globally and more than double the share to Asia from 2009 through 2021.

In the first three quarters of 2022, U.S. companies invested $172 billion in Europe – 10 times more than what they invested in the BRICs ($16.5 billion total in Brazil, Russia, India and China) and 26 times more than what U.S. firms invested in China ($6.7 billion). And despite economic uncertainties related to Russia's war against Ukraine, U.S. companies in 2022 earned an estimated $325 billion from their operations in Europe – 48 times what they earned from operations in China.

U.S. companies spent about $11 billion in 2022 buying or investing in Chinese companies, according to the data service firm Dealogic. That is a small slice of the more than $1.5 trillion that U.S. companies invested globally last year.[17] Looking at mutual FDI flows standardized by GDP of the receiving country, China's reliance on U.S. FDI peaked in 2005, while U.S. reliance on Chinese FDI topped in 2016. 2020 levels were down considerably from the respective maximum level, at 8% for U.S. FDI in China and 13% for Chinese FDI in the United States.[18]

Share of the EU's total outward FDI position globally (2020)

25%

U.S.

2.5%

China

Chinese companies were responsible for just over 2% of foreign acquisitions in the EU in 2021, while U.S. and U.K. companies accounted for roughly 32% and 26%, respectively.[19] While Chinese FDI in Europe rose by 25% to $12.8 billion in 2021, that was from pandemic-depressed levels, and was skewed by one single $4 billion purchase of Philips' home appliances unit by Hong Kong-based private equity firm Hillhouse Capital. The annual figure was 77% below its 2016 peak of $41 billion. Chinese FDI in Europe remains overall on a downward trajectory, due to tougher scrutiny in Europe and China's own domestic economic struggles. Mergers and acquisitions accounted for 69% of Chinese FDI in Europe in 2021; greenfield investments of roughly $3.5 billion focused on the automotive and ICT industries.[20]

Meanwhile, Chinese FDI in the United States is very modest: just 6 deals worth $1.8 billion in 2021 and 5 deals valued at $3.2 billion in 2022. Both are far below the 2016 peak of 63 deals worth $53.5 billion.[21]

Despite geopolitical tensions, mainland Chinese companies remain eager to list their shares abroad as a way to raise capital and lift their brand visibility. They are now sidestepping the U.S., the UK and major EU exchanges by turning to Switzerland. Following a Switzerland-China Stock Connect deal signed in July 2022, Chinese companies raised more money in Zurich than in New York last year, although the amount – $3 billion – is relatively small. That figure is likely to increase, however, as dozens of Chinese companies join the listing pipeline.[22]

FDI from the EU into China totaled €5.5 billion between January and June 2022, higher than the €4.8 billion registered during the same period in both 2021 and 2020, and up slightly from the €5.4 billion invested in the first half of 2019. These figures pale in comparison with EU FDI in the United States. Also, they are not due to new European firms entering the Chinese market, they reflect a growing concentration, both in terms of the companies that are investing there, the countries they come from and the sectors in which they operate.[23]

In terms of countries, Germany leads the way, accounting for 43% of the total between 2018 and 2021, vs. 34% in the previous decade. According to the Rhodium Group, Germany, the Netherlands, the UK, and France made up 87% of European investment in China over the past four years, up from 69% in the previous decade.[24]

European investment in China by sector has been concentrated in autos, food processing, pharma, chemicals, and consumer products. It has also been defined by just a few companies. According to Rhodium, just four German firms – BMW, Mercedes, Volkswagen and BASF – accounted for a third of all European investment in China by value from 2018 to 2021. The top 10 European investors in China in each of the past four years made up nearly 80%, on average, of total European direct investment in the country, whereas over the previous decade the top 10 European investors in China made up just 49% of the total European investment value. Barely any

European companies are investing in the Chinese service sector, which as of 2020 made up 53% of the country's gross domestic product.[25]

From January to July 2022, China only recorded $15 billion worth of inbound M&A transactions, and in the third quarter of the year inflows dropped to a 20-year low. If one accounts for distortions from financial arbitrage and capital control circumvention, the data suggests that real economy foreign direct investments in China have actually been declining since 2020. Even if one uses the inflated official Chinese statistics, China's inward FDI stock has grown at a slower pace than its overall GDP, and the FDI intensity of China's economy is far behind most OECD countries.[26]

In addition, as we outline elsewhere in this report, these bustling transatlantic investment lanes are joined by innovation lanes hosting research and development flows that are the most intense between any two international partners. Jobs lanes provide employment for 16 million Europeans and Americans. And transatlantic digital lanes carry the vast majority of global digital content. In short, the commercial highway connecting Europe with the United States looks less like a two-way road than a twelve-lane Autobahn, with busier traffic and fewer speed limits.

The Importance of Intangibles and Indirect Trade

Conventional trade statistics also overplay China's role and underplay the role of the United States and Europe in other ways. For instance, standard metrics do not capture the value of intangibles in global value chains. Intangible assets include intellectual property, patents, trademarks, copyrights, brand names, product designs, software, databases, and certain types of business organization structures.[27] Failure to account for these intangibles in global supply chains substantially underestimates the nature and value of developed country exports and distorts trade balances between developed and emerging economies.

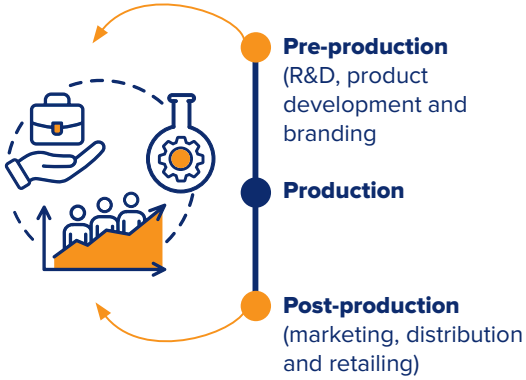
Extended supply chains have turned trade in goods into trade in tasks. Companies fragment their production processes and their services activities into a number of intermediate tasks, which are undertaken in many different places to exploit the specific comparative advantage of each location. These intermediate or indirect linkages now account for at least 70% of all global trade flows.[28]

Global supply chain tasks, in turn, can be broken down into three types: pre-production; production; and post-production. Pre-production tasks include research and development, product design, and branding. Post-production tasks include marketing, distribution, and retailing. Conventional trade measures account for only one of these tasks: manufacturing production. They ignore both pre- and post-production, the two tasks that on average add twice as much value, and account for more jobs, than production tasks. Moreover, the firms that specialize in pre- and post-production also determine where these tasks take place – and those firms by and large tend to be in developed economies, including the United States and in Europe.[29]

The concept of trade in factor income basically adds in what is missing from conventional metrics. Doing so results in new ways of looking at global trade flows. To take an example, Apple reaps 59% of its iPhone X's value added from pre- and postproduction tasks.[30] The least value-added is derived from its production tasks, which are located in China. Nonetheless, when those phones are exported to the United States and Europe, they are recorded as goods exports from China, even though most of the value accrues to a U.S. company. Moreover, Apple's additional billions in sales in China do not turn up in U.S. trade statistics. The trade-in-factor-income approach adds Apple's profits from within China to U.S. exports to China, because, as a recent Asian Development Bank (ADB)/WTO report puts it, "that is the underlying economic reality, not the accounting fiction". Doing so across all U.S. companies cuts the U.S.-China goods trade deficit by one-third.[31]

Extended supply chains have turned trade in goods into trade in tasks

Intermediate tasks in global supply chains



Intermediate tasks add twice as much value and account for more jobs than production tasks.

For governments, derisking means seeking ways to both promote trade and investment and protect core economic and security interests and human rights values. For companies, derisking means identifying strategies to maintain and expand commercial ties with China while mitigating supply chain vulnerabilities and being careful not to run afoul of growing government restrictions.

This underscores the importance of intellectual property as a driver of both supply chains and investment flows. It also highlights its value as a source of income for developed economies such as the United States and Europe: 90% of the value of firms in the S&P 500 corresponds to intellectual property, which contributes twice as much to the value of trade as does physical capital.[32]

An additional lens through which we can understand the role of the United States and European companies in global supply chains is through indirect trade, which is the amount of trade conducted through intermediates instead of a simple direct exchange between two parties. According to the ADB/WTO, Germany, the United States, France and the Netherlands account for four of the world's top five indirect exporters. And while conventional trade statistics portray China as the world's leading exporter, it ranks third in terms of indirect exports. Moreover, its share is falling – due to rising labor costs and the declining share of trade in China's economy. At the same time, the integration of various European and East Asian countries in cross-border supply chains is rising.

Derisking, not Decoupling

"Decoupling" has become a favorite buzzword to depict efforts to undo critical dependencies on suspect firms or antagonistic states. The term continues to resonate, yet it is misleading as a description of how either countries or companies are acting in this competitive and turbulent age of disruption. "Decoupling" suggests completely unhooking two connected entities. A closer look reveals a more nuanced picture.

Evidence is sparse that major economies have actually "decoupled" from one another. Russia has been the leading target of Western decoupling efforts over the past year, thanks to Moscow's invasion of Ukraine. But the results have been mixed, as we discuss in Chapter 1. China has been the larger focus of "decoupling" efforts, but there are only scattered signs of disentanglement in some limited technology sectors.

Most countries and companies are not looking to cut the cord with China. They are "derisking," not decoupling. For governments, derisking means seeking ways to both promote trade and investment and protect core economic and security interests and human rights values. For companies, derisking means identifying strategies to maintain and expand commercial ties with China while mitigating supply chain vulnerabilities and being careful not to run afoul of growing government restrictions.

The U.S. Protect and Promote Agenda

The United States has informally labeled its approach the "protect and promote" agenda. The "protect" element of the policy seeks to impede technological and military advances in countries of concern, like China, Russia, North Korea and Iran. Washington's tools are tougher export controls, stricter inbound and outbound investment screening, and human rights measures such as the Uyghur Forced Labor Prevention Act and forced labor bans in the US-Mexico-Canada Agreement (USMCA). The "promote" strand seeks to foster innovation and use subsidies and other forms of industrial policy to maintain "as large of a lead as possible" in sectors where there is a "national security imperative," including semiconductors, quantum computing, artificial intelligence, biotechnology and clean energy.[33]

One key tool in the "protect" agenda is the "Entity List" of companies which must apply for permission to buy goods with potential military uses. The number of firms on this list increased from 130 in 2018 to 568 in 2022; a quarter of them are Chinese. A second tool, the Foreign Direct Product Rule (FDPR), restricts sales of items using U.S. technology, even if they are designed and manufactured abroad. A third tool is investment screening. Scrutiny of inward investment has already been tightened, and the Biden administration is about to unveil measures to promote greater transparency in U.S. outbound investments, particularly in advanced technologies, in China.[34]

In August 2020, the Trump administration used the FDPR to cut Chinese company Huawei off from American technology. The firm's revenues plunged by 29% in 2021 and its smartphones disappeared from the market altogether. In February 2022 the Biden administration issued additional FDPRs to cut off Russia from all U.S. elements of global technology supply chains. In October 2022, it followed these actions with severe FDPR restrictions that blocked U.S. firms from shipping high-end microchip manufacturing equipment to China and making it easier to crack down on countries that do not follow suit. Japan and the Netherlands agreed in January 2023 to join the restrictions. As a result, China is effectively barred from advanced semiconductors.[35] In February 2023, US chipmakers were told that they could only receive money under the CHIPS Act if they agreed not to expand capacity in China for a decade, and not to engage in any joint research or technology licensing effort involving sensitives technologies with a "foreign entity of concern.

In November 2022, the U.S. Federal Communications Commission (FCC) barred Huawei and Chinese tech company ZTE from selling equipment in the United States – the first time ever that the FCC has banned electronics equipment on national security grounds. In December 2022 the administration added another three dozen Chinese companies to the Entity List and applied the FDPR to 21 additional entities.[36]

These measures are proceeding in tandem with the "promote" agenda: a $2 trillion overhaul of the U.S. economy that seeks to do many things at once: address climate change, boost manufacturing, curb dependence on China, and revive regions of the country that had been lagging. It is the largest set of U.S. industrial policies since the New Deal, embodied in three major pieces of legislation: the $1.2 trillion Infrastructure Investment and Jobs Act; the $280 billion CHIPS and Science Act; and the Inflation Reduction Act (IRA), which was valued initially at $396 billion, yet could be much more, since some of the tax credits it offers are not capped. The Chips and Science Act has triggered $200 billion of private investment in U.S. chipmaking capacity.[37] The IRA could spur $1.7 trillion in public and private investments, according to Credit Suisse. We discuss the IRA in Chapter 4.

These federal outlays, which are already reshaping supply chains, are being complemented by subsidies offered by some individual states. Georgia, for instance, provided over $3 billion in financial incentives last year to two carmakers building electric vehicle factories.[38]

The EU's Protect and Promote Agenda

While the EU and its member states do not use the phrase "protect and promote" to describe their derisking agenda, essentially this is also what they, and the UK, are doing.

The EU's "protect" agenda is complicated because member states, not the European Commission, retain authority over many sensitive areas, and each tends to address dependency issues differently. When serious challenges arise, member states have shown a willingness to act. In the last year alone European governments spent €570 billion to shield their own societies from the energy shocks generated by the war.[39] They guard their prerogatives jealously.

Nevertheless, the EU does have tools at its disposal. It has long had the ability, if not always the will, to use trade defense instruments to impose anti-subsidy and antidumping duties on unfairly cheap imports. It has imposed a broad range of export controls on Russia, as we discuss in Chapter 1. Member states have extended the Xinjiang sanctions they first imposed in March 2021.

In addition, Germany's Supply Chain Due Diligence Act, which came into force on January 1, requires companies to meet extensive obligations to ensure human rights and environment best practices in their supply chains. A related, and even more stringent, EU Supply Chain Due Diligence Directive will be debated in the European Parliament this year.

Moreover, at the urging of the Commission, nearly all member states now have inward investment screening mechanisms, and some have tightened the laws they already had, as has the UK. This year the Commission is looking at ways to screen outbound investments.

Finally, the EU's new Foreign Subsidies Regulation, which comes into force on July 1, 2023, empowers the Commission to prevent state-subsidized companies from producing in Europe or bidding for public procurement contracts there. While the rule was originally intended with China in mind, it could negatively affect U.S. companies deemed to be enjoying state subsidies under the IRA or related legislation.[40]

The EU's "promote" agenda has centered on NextGenerationEU, a €806 billion funding program to help EU member states recover and revive from the pandemic. It is the largest stimulus

package ever financed in Europe. The funds are being reinforced by elements of the EU's long-term budget, bringing the total of deployable funds to €2.018 trillion in current prices, to help create, in the EU's words, a "greener, more digital and more resilient" Europe. Elements of the package have been reshaped in response to ongoing events, particularly the need to shift away from energy dependencies on Russia.[41] Debates about repurposing the funds have been reenergized by European concerns over massive cleantech subsidies being offered by China and the United States, as we discuss in Chapter 4.

The "promote" agenda also includes the European Chips Act, which is intended to strengthen semiconductor value chains within the EU, with a goal of achieving 20% of worldwide production capacities. While the Act boasts a budget of more than €43 billion, it has not yet been approved, and much of the money is drawn from existing EU programs, from member states, or assumed private investments.

Derisking Made in China

The derisking phenomenon is not confined to the U.S. and Europe. When Beijing announced its "Made in China 2025" program eight years ago, it was explicit in its ambition to free China from dependence on Western technologies and to direct massive government support to make the country a world-beater in a number of critical sectors. It has since adjusted some aspects of this effort, but the essentials remain. Beijing also proclaimed a "military-civil fusion strategy" intended to use technological advances to align its commercial and defense sectors, and prioritized the capability to master "choke point" technologies. China's current five-year plan emphasizes industrial strategies to catch up and lead in critical technology domains. U.S. Secretary of State Antony Blinken says Beijing's plan seeks to make "China less dependent on the world and the world more dependent on China".[42] The European Chamber of Commerce in China adds that Beijing's policies are causing China to lose its "allure," as many foreign firms reconsider their China presence.

Even before the pandemic and Russia's renewed aggression, many companies had grown concerned about vulnerabilities and fragilities that had been accumulating in their deeply intertwined supply chains.

Corporate Strategies

Even before the pandemic and Russia's renewed aggression, many companies had grown concerned about vulnerabilities and fragilities that had been accumulating in their deeply intertwined supply chains. The subsequent conflation of so many shocks has now led to an across-the-board rethink of the hyper-globalization model.

Some firms have been forced to divest or divert production from Russia or China. We address Russia in Chapter 1. Divesting from China is a path being chosen by such prominent firms as Carrefour, Gap, Yahoo, Epic Games and Microsoft-owned LinkedIn. U.S. computer maker Dell aims to stop using chips made in China by 2024 and has told suppliers to significantly reduce the amount of other "made in China" components.[43] According to the Asian Development Bank, more than 83% of North American businesses and about 90% of European firms have announced plans to relocate at least part of their supply chains away from China.[44]

Most firms are simply not coming to China. The number of greenfield FDI projects in China announced by foreign investors fell to historic lows in 2020 and 2021, both in absolute and relative terms, accelerating a downward spiral that began in the middle of the last decade. China's share of global FDI projects has sunk by a factor of five over the past two decades, from roughly 15% in 2003 to 3.3% in 2021, behind Poland (3.4%) and India (3.4%), according to fDi Markets. Twenty years ago, China attracted one in six FDI projects announced globally. Now its attracts just one in 33. And these figures are likely to be even lower, when one considers that 71% of China's inbound FDI came from Hong Kong in 2021. A large portion of those inflows originated from Chinese companies, bringing into question how "foreign" such direct investments are.

Greenfield FDI is also becoming more concentrated, in terms of numbers of firms and countries. Notably, fDi Markets data shows that German and Japanese companies have traded places. In 2010, Japanese companies accounted for 14.7% of the greenfield FDI market in China; German firms occupied roughly 8.6%. In 2021,

German companies were responsible for 14.6% and Japanese companies for only 8.1%.

From Chains to Webs

Some corporations are adopting separate supply chain models for the China and non-China markets. Apple, Yum! Brands, and McDonald's are among the companies that have split out their China business. Many are adopting "China plus one" or "China plus two" approaches: retaining existing production facilities in China, but striking additional supply deals, or setting up additional manufacturing plants, in other countries.[45]

Many corporations are shifting from supply chains to supply webs. They are replacing single-sourcing of critical components with multiple, and sometimes geographically diverse, suppliers so as to prioritize uninterrupted deliveries over just-in-time efficiencies. By the end of 2022 almost half of companies had diversified their supplier base, and less than 15% were relying on "just-in-time" deliveries.[46]

Vietnam has been the biggest beneficiary of this trend. Half of Google's newest Pixel phones will be made in Vietnam this year. Apple is supplementing its operations in China by producing iPads, MacBooks, AirPods and smartwatches in Vietnam. Apple's many suppliers are following. The results are impressive: high-tech goods as a share of Vietnam's exports hit 42% in 2020, up from 13% in 2010. Vietnam's economy has more than doubled in size over the past decade.[47]

India is also gaining from corporate diversification away from China, as multinationals invest not just in low-cost labor but in higher-end innovation activities. Between January and October 2022, India attracted 225 FDI projects in R&D activities – a third of the global total and as many projects as the U.S., UK and China combined. Its global market share of handset production, including smartphones and feature phones, grew from 9% in 2016 to 16% in 2021, whereas China's share, while still dominant, declined from 74% in 2016 to 67%. Apple and its suppliers are developing India as a source of growth and as a strategic production base, with exports intended for Europe and other markets.[48]

Near-shoring and Friend-shoring

Related to these shifts is a phenomenon dubbed "near-shoring," "friend-shoring," or "ally-shoring," which means production and sourcing/shifting supply chains away from geopolitical rivals toward more politically friendly countries, or to close allies. U.S. and European officials have publicly endorsed "friend-shoring" approaches. The U.S. CHIPS Act includes provisions prioritizing partnerships with allies as well as guardrails to weaken commercial ties with China. So does the U.S. Inflation Reduction Act, although with significant discriminatory elements, as we discuss in Chapter 4. The EU's still-pending Chips Act also targets "excessive dependencies" and foresees friend-shoring components such as "semiconductor international partnerships with like-minded countries." Japan, too, has offered incentive packages to U.S. and European firms to expand cooperation in tech fields, including semiconductor production. U.S. and European labor-abuse laws have been an additional factor prompting major textile brands to near-shore closer to home, although China remains a major production site for most.[49]

Twenty years ago, China attracted one in six FDI projects announced globally. Now its attracts just one in 33.

Semiconductors, fueled by offers of massive government subsidies, lead the field when it comes to friend-shoring initiatives. Intel, TSMC, and Samsung, the world's three biggest chipmakers, have announced commitments to invest at least $380 billion over the next decade to build new factories in Japan, Germany, Ireland, Israel, Japan, South Korea, Taiwan and the United States. Intel says its goal is to reduce Asia's share of its global semiconductor manufacturing from 80% to 50% by the end of the decade, with the U.S. accounting for 30% and Europe for 20%.[50]

Overall, however, friend-shoring initiatives have yet to progress beyond early-stage efforts. One attempt is the Minerals Security Partnership launched in 2022. Its members – Australia, Canada, the European Commission, Finland, France, Germany, Japan, South Korea, Sweden, the UK and the United States – have declared their intent to form a supply-chain bloc for critical materials mining through refining to manufacturing and recycling, based on Western standards and excluding China, which currently is central to the production and refining of many critical materials.[51]

Box 1. Mexico's "Geopolitical Planetary Alignment"

Mexico is the new face of nearshoring, as companies seeking to avoid China tensions and supply chain disruptions relocate production facilities closer to, but just outside, the U.S. market. U.S. investors have put more money into Mexico than China in each of the past two years, and Mexico exported 18% more goods ($455 billion) to the United States in 2022 than it did in 2021. These trends reflect the deeply intertwined nature of supply chains across the North American market; roughly 40% of the value of Mexico's exports to the U.S. consists of parts and components made at U.S. factories. This contrasts greatly with U.S. imports from China, only 4% of which are U.S.-made.[52]

Mexico had failed earlier to capitalize on the U.S.-China trade conflicts: between 2018 and 2021 the proportion of manufactured goods exported into the U.S. from Mexico barely changed, whereas non-Chinese Asian manufacturers increased their share of U.S. manufactured goods imports from 12.6% to 17.4%. Now, however, European and Asian companies are joining U.S. firms to locate production in Mexico. BMW will invest an additional €800 million to boost electric vehicle production in Mexico, which stands to benefit from its inclusion in U.S. subsidies under the Inflation Reduction Act. Scores of Taiwanese and even mainland Chinese companies are following trailblazing South Korean and Japanese companies that have been using Mexico as a nearshoring base within the vast market covered by the USMCA agreement.[53]

These moves are refashioning supply chains within North America. Rather than offloading containers from Asia at Southern California ports, more U.S. companies are using Mexico's Pacific port of Manzanillo. A significant number of those containers are then transported to the Mexican border state of Nuevo Leon, where their contents are either further processed or brought across the border to Texas. The results are striking: since October 2021, the state of Nuevo Leon has attracted more than $7 billion in foreign investment – more FDI that has flowed into China during that period. What is equally striking is that Chinese companies have accounted for 30% of those investments, second only to the United States at 47%. "Nuevo Leon is having a geopolitical planetary alignment," says the state's governor.[54]

These new dynamics also reconfiguring supply routes within the United States, as more goods flow to America's largest inland port of Laredo, Texas, and from there on to the U.S. Midwest and East Coast. Previously, Midwest/East Coast demand accounted for two-thirds of the shipments out of Southern California ports.

Notes

1 The White House, "Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth," June 2021, https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf; European Commission, "Strategic dependencies and capacities," May 5, 2021, https://ec.europa.eu/info/sites/default/files/swd-strategic-dependencies-capacities_en.pdf; Ganyi Zhang, "EU-US: Public policies take up the challenges of the supply chain," Upply, July 23 2021, https://market-insights.upply.com/en/eu-us-public-policies-take-up-the-challenges-of-the-supply-chain; Torsten Riecke, "Resilience and decoupling in the era of great power competition," Merics, August 20, 2020, https://merics.org/en/report/resilience-and-decoupling-era-great-power-competition.

2 Jason Douglas and Stella Yifan Xie, "Pandemic Bolsters China's Position as the World's Manufacturer," *Wall Street Journal*, August 21, 2022; IEA, "Special Report on Global PV Solar Supply Chains," August 2022, https://iea.blob.core.windows.net/assets/d2ee601d-6b1a-4cd2-a0e8-db02dc64332c/SpecialReportonSolarPVGlobalSupplyChains.pdf; *The Switch Report 2022*, FDIIntelligence/*Financial Times* and Enel Foundation; Alice Tidey, "The EU needs renewables to curb Russian fossil fuel dependence. For these, it's dependent on China," Euronews, June 9, 2022, https://www.euronews.com/my-europe/2022/06/09/the-eu-needs-renewables-to-curb-russian-fossil-fuel-dependence-for-these-it-s-dependent-on.

3 Douglas and Xie; Aya Adachi, Alexander Brown, Max J. Zenglein, "Fasten your seatbelts: How to manage China's economic coercion," Merics, August 25, 2022, https://www.merics.org/en/report/fasten-your-seatbelts-how-manage-chinas-economic-coercion.

4 Strand Consult, "The Market for 5G RAN in Europe: Share of Chinese and Non-Chinese Vendors in 31 European Countries."

5 "Giving up on China," *The Economist*, November 24, 2022.

6 "Giving up".

7 "Giving up"; John Seaman, et al., "Dependence in Europe's Relations with China," European Think Tank Network on China, April 2022, https://media.realinstitutoelcano.org/wp-content/uploads/2022/04/etnc-dependence-in-europes-relations-with-china.pdf; "Giving up;" Thilo Hanemann, Mark Witzke, and Yvonne Yu, "Cutting Through the Fog: FDI in China Since COVID-19," Rhodium Group, December 13, 2022, https://rhg.com/research/cutting-through-the-fog/; John Newman, Alexander Campbell and John-David Seelig, "The real reasons why Western companies chase Chinese sales," *Financial Times*, October 11, 2022.

8 "Giving up".

9 UNCTAD; Douglas and Xie.

10 Figures not adjusted for inflation. See Yuka Hayashi and Anthony DeBarros, "U.S.-China Trade Grows as Spy Balloon Raises Tensions," *Wall Street Journal*, February 9, 2023.

11 Hayashi and DeBarros.

12 Marc Gilbert, Nikolaus Lang, Georgia Mavropoulos, and Michael McAdoo, "Protectionism, Pandemic, War, and the Future of Trade," BCG, January 17, 2023.

13 Michael A.Witt, Arie Y. Lewin, Peter Ping Li, Ajai Gaur, "Decoupling in international business: Evidence, drivers, impact, and implications for IB research," *Journal of World Business*, Vol. 58, Issue 1, January 2023.

14 Eurostat, balance of payments database, https://ec.europa.eu/eurostat/web/balance-of-payments/data/database.

15 Unfortunately, a number of public agencies in Europe make the mistake of reducing overall trade to just trade in goods. The German Federal Statistical Office, for instance, consistently proclaims that China is Germany's top trading partner, even though those claims are patently false if one looks at overall German-China trade, not just trade in services.

16 See Iori Kawate, "Foreign investment in China slumps to 18-year low," *Nikkei Asia*, February 28, 2023; Daniel S. Hamilton, "CAI is DOA," *Asia-Europe Journal*, April 2021, https://doi.org/10.1007/s10308-021-00624-4; Baker McKenzie/Rhodium Group, "Chinese Outbound FDI Held Steady In 2021, As Global FDI Rebounded," January 22, 2022, https://www.bakermckenzie.com/en/newsroom/2022/01/chinese-outbound-fdi-held-steady-in-2021.

17 Amy Swanson and Lauren Hirsch, "U.S. Aims to Curtail Technology Investment in China," *New York Times*, February 9, 2023, https://www.nytimes.com/2023/02/09/business/us-china-investing-tech-biden.html

18 Witt, et al.

19 Kim Mackrael, "EU Foreign-Subsidy Limits Target China but Also Hit U.S.," *Wall Street Journal*, December 28, 2022.

20 Max J. Zenglein and Gregor Sebastian, "Chinese foreign direct investment in Europe: the downward trend continues," UNIDO, December 2022, https://iap.unido.org/articles/chinese-foreign-direct-investment-europe-downward-trend-continues.

21 Derek Scissors, "Chinese Investments in the United States – Handout," American Enterprise Institute, January 23, 2023, https://www.aei.org/multimedia/chinese-investments-us-handout/.

22 Kenji Kawase, "Switzerland helps China Inc. satisfy its itch for overseas listings," *Nikkei Asia*, February 10, 2023, https://asia.nikkei.com/Business/Business-Spotlight/Switzerland-helps-China-Inc.-satisfy-its-itch-for-overseas-listings.

23 Gabriel Dominguez, "Even as China loses its luster, European companies continue to invest," *Japan Times*, September 15, 2022, https://www.japantimes.co.jp/news/2022/09/15/business/china-europe-investment/.

24 See Agatha Kratz, Noah Barkin, and Lauren Dudley, "The Chosen Few: A Fresh Look at European FDI in China," Rhodium Group, September 14, 2022, https://rhg.com/research/the-chosen-few/.

25 Kratz, et al.; Dominguez.

26 For more, see the China Pathfinder produced by the Rhodium Group and the Atlantic Council, https://chinapathfinder.org/direct-investment-openness/.

27 Asian Development Bank, WTO et al., *Global Value Chain Development Report 2021: Beyond Production*, November 2021, https://www.adb.org/publications/global-value-chain-development-report-2021.

28 See Isabella Cingolani, Pietro Panzarasa & Lucia Tajoli, "Countries' positions in the international global value networks: Centrality and economic performance," *Applied Network Science*, 2:21 (2017), https://link.springer.com/article/10.1007/s41109-017-0041-4.

29 ADB/WTO et al.; Y. Xing, "Global Value Chains and the Missing Exports of the United States," *China Economic Review*, 61 (C) (2020), https://doi.org/10.1016/j. chieco.2020.101429.

30 ADB/WTO et al.; Y. Xing, "How the iPhone Widens the US Trade Deficit with China: The Case of the iPhone X," *Frontiers of Economics in China*, 15 (4), pp. 642–658 (2020).

31 ADB/WTO et al.; B. Meng, Y. Gao, J. Ye, M. Zhang, and Y. Xing, "Trade in Factor Income and the US-China Trade Balance," IDE Discussion Paper. No. 819 (Chiba, Japan: Institute of Developing Economies – Japan External Trade Organization, 2021), https://www.ide.go.jp/English/Publish/Reports/Dp/819.html.

32 ADB/WTO et al.; Ocean Tomo, "Intangible Asset Market Value Study" (Chicago, IL: Ocean Tomo Intellectual Capital Equity, 2020), https://oceantomo.com/intangible-asset-market-value-study/.

33 "Remarks by National Security Advisor Jake Sullivan at the Special Competitive Studies Project Global Emerging Technologies Summit, The White House, September 16, 2022, https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/09/16/remarks-by-national-security-advisor-jake-sullivan-at-the-special-competitive-studies-project-global-emerging-technologies-summit/; "Efficiency be damned," *The Economist*, January 12, 2023; Gavin Bade, " 'A sea change': Biden reverses decades of Chinese trade policy, Politico, December 26, 2022, https://www.politico.com/news/2022/12/26/china-trade-tech-00072232.

34 UNCTAD: Bade; "Chains of control," *The Economist*, February 8, 2023; Amy Swanson and Lauren Hirsch, "U.S. Aims to Curtail Technology Investment in China," *New York Times*, February 9, 2023, https://www.nytimes.com/2023/02/09/business/us-china-investing-tech-biden.html.

35 "Efficiency be damned,"; "Chains of control".

36 James Politi, "Chinese telecoms groups Huawei and ZTE barred from US sales," *Financial Times*, November 25, 2022; Bade; Demetri Sevastopulo, Kathrin Hille and Qianer Liu, "US adds 36 Chinese companies to trade blacklist," *Financial Times*, December 15, 2022.

37 Lauly Li, Cheng Ting-Fang, Peggy Hollinger and Kathrin Hille, "Chipmaker TSMC in talks with suppliers over first European plant," *Financial Times*, December 23, 2022.

38 "Rosy for riveters," *The Economist*, February 2, 2023; "Big, green and mean," *The Economist*, February 2, 2023.

39 Trebesch, et al.

40 Kim Mackrael, "EU Foreign-Subsidy Limits Target China but Also Hit U.S.," *Wall Street Journal*, December 28, 2022.

41 European Commission, "Recovery plan for Europe," https://commission.europa.eu/strategy-and-policy/recovery-plan-europe_en.

42 Witt, et al.; "A cause for concern," *The Economist*, October 10, 2022; Rana Foroohar, "We must prepare for the reality of the Chip Wars," *Financial Times*, October 31, 2022.

43 Cheng Ting-Fang, "Dell looks to phase out 'made in China' chips by 2024," *Nikkei Asia*, January 5, 2023; Christopher Mims, "Why Global Supply Chains May Never Be the Same," *Wall Street Journal*, March 26, 2022; "Giving up"; Chris Stokel-Walker, "China is Tightening Its Grip on Big Tech," *Wired*, June 29, 2022.

44 Witt, et al.

45 Lauly Li, Leo Lewis, Kana Inagaki, Cheng Ting-Fang, "Supply chains shifts and splits," *Financial Times*, January 26, 2023; "Japanese companies explore hot to go 'zero-China' amid tensions," *Wall Street Journal*, October 23, 2022; Bryce Baschuk, "Friend-Shoring Shifts From Political Slogan to Slog for Companies," Bloomberg, October 3, 2022; Witt, et al.; Chris Miller, "The US-China chip war is reshaping tech supply chains," *Financial Times*, October 7, 2022.

46 Daisuke Wakabayashi and Tripp Mickle, "U.S. Companies on Pace to Bring Home Record Number of Overseas Jobs," *Wall Street Journal*, September 1, 2022; Mims; Thilo Hanemann, Mark Witzke, and Yvonne Yu, "Cutting Through the Fog: FDI in China Since COVID-19," Rhodium Group, December 13, 2022, https://rhg.com/research/cutting-through-the-fog/. William Boston, "Volkswagen Prepares for a Deglobalized World," *Wall Street Journal*, March 27, 2022; Economist Impact 2022, "Trade in Transition," https://impact.economist.com/projects/tradeintransition-2022/global-overview/.

47 Wakabayashi and Tripp; Lien Hoang, "Vietnam's battle to climb the global value chain," *Nikkei Asia*, September 21, 2022; Cheng Ting-Fang.

48 Alex Irwin-Hunt, "India widens global lead in research and development FDI," FDI Intelligence, December 7, 2022, https://www.fdiintelligence.com/content/data-trends/india-widens-global-lead-in-research-and-development-fdi-81825; Lawrence Yeo, "The glimmers of light for Asia in 2023," FDI Intelligence, December 9, 2023, https://www.fdiintelligence.com/content/opinion/the-glimmers-of-light-for-asia-in-2023-81753; Cheng Ting-Fang, "Apple asks suppliers to shirt AirPods, Beats production to India," *Nikkei Asia*, October 5, 2022; John Reed, "Apple expands iPhone production in India in shift away from China," *Financial Times*, September 24, 2022; Wakabayashi and Mickle; Hoang.

49 "Transcript: US Treasury Secretary Janet Yellen on the next steps for Russia sanctions and 'friend-shoring' supply chains," Atlantic Council, April 13, 2022; Telephonic Press Briefing with U.S. Secretary of Commerce Gina M. Raimondo, U.S. Department of State, https://www.state.gov/telephonic-press-briefing-with-u-s-secretary-of-commerce-gina-m-raimondo; Arjun Neil Alim and Oliver Telling, "Clothing companies look to reduce China manufacturing exposure," *Financial Times*, February 18, 2023; Tim Higgins and Asa Fitch, "Intel CEO Calls New U.S. Restrictions on Chip Exports to China Inevitable," *Wall Street Journal*, October 24, 2022; Baschuk.

50 Lauly Li et al., "Chipmaker TSMC".

51 U.S. Department of State, "Minerals Security Partnership," June 14, 2022, https://www.state.gov/minerals-security-partnership/.

52 U.S. Census Bureau, "Trade in Goods with Mexico," https://www.census.gov/foreign-trade/balance/c2010.html ; Peter S. Goodman, " 'Ok, Mexico, Save Me': After China, This Is Where Globalization May Lead," *New York Times*, January 1, 2023; Michael Stott and Christine Murray, "Why Mexico is missing its chance to profit from US-China decoupling," *Financial Times*, July 3, 2022.

53 Stott and Murray; Lauly Li, et al., "Supply chains shifts and splits"; Peter S. Goodman, "Why Chinese Companies Are Investing Billions in Mexico," *New York Times*, February 3, 2023.

54 Peter S. Goodman, "How a Texas Border Town Is Shaping the Future of Global Trade," *New York Times*, January 5, 2023.

4

Transatlantic Energy Transformations

Three major shifts are transforming the transatlantic energy economy. First, the United States has become a critical energy supplier to Europe. Second, groundbreaking U.S. and EU policy initiatives are generating some adjustment challenges, yet ultimately promise to accelerate each party's efforts to address climate change, supercharge the transition to cleaner energies, boost competitiveness, and reduce strategic vulnerabilities. Third, already dense and now deepening transatlantic linkages among energy investors, innovators and firms offer substantial opportunities for North America and Europe to spearhead the next generation of clean technologies.

The United States: A Critical Energy Partner for Europe

Europe has reduced its dependence on Russian gas from 40% to 10% in less than one year.[1] Spiking prices have fallen back to pre-war levels. Europeans used less gas, built up their strategic reserves, and switched to alternative energy sources. They benefited from a relatively mild winter. Critical gaps were filled by a surge in gas imports from other countries – notably the United States. U.S. liquefied natural gas (LNG) exporters supplied more than three-fourths of Europe's additional gas needs in the critical months following the outbreak of the war, and accounted for more than 50% of Europe's LNG supplies for the year as a whole.[2] More than half of U.S. global LNG exports went to Europe in 2022. U.S. exporters shipped roughly 2.5 times more LNG supplies to Europe in 2022 than in 2021, and 3 times more than they supplied to all of Asia in 2022 (Table 1).

Europe has been slower at weaning itself off Russian oil, but a package of recent measures – including price caps on Russian oil and bans on seaborne imports of Russian crude and refined petroleum products – could shrink Russian oil supplies by 90% in 2023. In the meantime, U.S. crude oil exports to Europe jumped 70% in 2022, and now account for 12% of Europe's oil supplies. In the first six months of 2022 Europe surged ahead of Asia as the top purchaser of U.S. crude oil.[3]

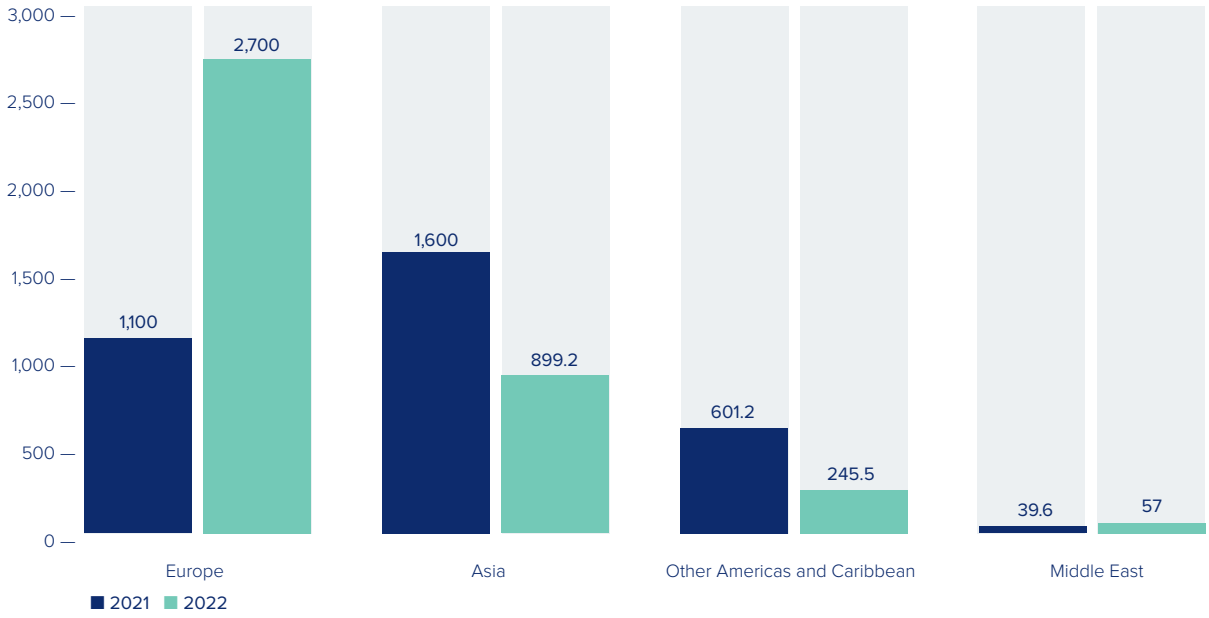
Three major shifts

U.S. as critical energy supplier to Europe

New policy initiatives to accelerate green transition and boost competitiveness

Substantial opportunities in clean technology for private sector

Table 1. **U.S. LNG exports to Europe more than doubled in 2022** (U.S. Liquefied Natural Gas Exports in Thousand Cubic Feet, By Region)



Sources: U.S. Department of Energy; Benjamin Storrow, Sara Schonhardt, "How Russia's war shattered global energy routes," E&E News Climate Wire, February 21, 2023.

Comparing U.S. and EU Green Subsidies

Europe has reduced its dependence on Russian gas from 40% to 10% in less than one year.

The Inflation Reduction Act

The U.S. Inflation Reduction Act (IRA) passed by the U.S. Congress in 2022 is by far the single biggest climate investment in U.S. history. It puts the U.S. on a path to roughly 40% emissions reductions by 2030. It is fueled by $369 billion in subsidies and tax credits to qualifying parties. As we discuss in Chapter 3, it is part of an even larger U.S. effort to position its domestic economy for a cleaner energy future, to be more globally competitive, and to mitigate critical materials dependencies on China and other suppliers. The IRA could spur $1.7 trillion in public and private investments, according to Credit Suisse. BCG forecasts that the IRA could lower global clean-energy costs by as much as 25% ($120 billion) this decade.[4]

European officials have hailed the IRA's climate goals yet expressed concerns about the Act's discriminatory local content provisions, and its market-distorting manufacturing subsidies that might induce European firms to shift their production to the United States. Such concerns are amplified by far lower U.S. energy costs. The U.S. and the EU have established a Task Force to explore whether the IRA may be implemented in ways that alleviate EU worries.

Some concerns are being addressed. Used clean vehicles, which comprise 70% of the market, will benefit from tax credits and are not subject to local sourcing requirements. The new implementing rules also allow subsidies for "commercial clean vehicles" produced by European and other foreign carmakers if they are leased and not purchased, a favored option of U.S. consumers. Currently half of German electric vehicles in the United States are leased.[5]

Discussions continue about batteries. The IRA stipulates that batteries must meet a gradually increasing threshold of critical minerals extracted and processed in countries with "free trade agreements" with the U.S., beginning at 40% in 2023 and increasing by 10% each year through 2026. Neither the EU nor the UK has a free trade agreement with the United States. Drawing on their 2022 Minerals Security Partnership with a number of other countries, the U.S. and the EU are advancing critical materials pacts facilitating freer trade of these materials amongst signatories. These limited arrangements might qualify the EU and others as "free trade" partners, without requiring congressional approval for formal, comprehensive Free Trade Agreements.

U.S. carmakers have joined their European counterparts in their concern about how fast they will be able to meet the IRA's provisions that restrict tax credits to new electric vehicles that do not include battery components or critical materials coming from "foreign entities of concern," including China, which is the source for many such materials.

Some European carmakers have complained that their exports could be hit by IRA provisions limiting tax credits to manufacturers that complete "final vehicle assembly" in North America. This ignores the dense transatlantic linkages that underpin the auto industry. The main European automakers already conduct "final vehicle assembly" at their plants in the United States. Volkswagen is the largest European seller of electric vehicles in the U.S., for instance, and it produces its best-selling model in Chattanooga, Tennessee. Mercedes produces its electric EQS in Tuscaloosa, Alabama. Two of BMW's electric vehicle brands are produced at its plant in Spartanburg, South Carolina, which is bigger than its home plant in Munich.

These activities mean that European exports of finished electric vehicles to the United States are quite low. Those that are exported from Europe face a 2.5% tariff when they enter the U.S., but that is far lower than the 10% tariff the European Commission imposes on every U.S. car exported to the EU. In fact, most European auto-related exports to the U.S. do not consist of finished vehicles. They are components shipped from one part of a European firm based in Europe to its affiliate in the United States.

Inflation Reduction Act subsidies and tax credits

$369 billion

The EU's Green Subsidies

In February 2023, the European Commission proposed a Green Deal Industrial Plan for the Net-Zero Age, accompanied by a Net Zero Industry Act, as new elements to the EU's existing array of measures intended to speed up and incentivize development of clean technology. To power the Plan, the Commission wants to repurpose roughly $250 billion in loans from the NextGenerationEU pandemic recovery fund that have not been drawn down. It has proposed establishing a European Sovereignty Fund to drive joint investment in specific clean technology projects. The Commission wants to hone in on a key set of industries, including the production of batteries, solar panels, wind turbines, heat-pumps, electrolyzers and carbon capture usage and storage as well as related critical raw materials.[6] Any potential joint funding could draw on new funding instruments or an array of existing industrial policy tools and mechanisms designed to achieve energy breakthroughs, including the RePower EU initiative, the cohesion funds, the large-scale Important Projects of Common European Interest (IPCEI), and the Green Deal.

Many EU member states offer additional support measures. For instance, almost every EU country subsidizes the purchase of electric vehicles; Bruegel estimates such support totaled $6.5 billion and averaged about $6,500 per vehicle in 2022 (compared to IRA tax credits of up to $7,500 per vehicle). And while EU rules limit state aid by member governments as a way to ensure smaller and poorer states are not swamped by bigger and richer ones, those limits were loosened for the pandemic recovery and again after Russia's 2022 invasion of Ukraine. EU rules are now likely to be relaxed once more, at least until 2025, in response to the IRA.

Comparing U.S. and EU Initiatives

Bruegel concludes that EU and U.S. IRA subsidies for electric vehicles and cleantech manufacturing are roughly similar in size, and that European subsidies for renewable energy production are four times higher than subsidies foreseen by the IRA (Table 2).

Lost in the transatlantic debate about competing transatlantic subsidies is the challenge posed by China.

Table 2. Clean and Green: Notional U.S. and EU Subsidies, 2022-2031

Category	IRA	EU
Electric vehicle purchases	$7,500/vehicle	$6,500/vehicle
Cleantech manufacturing*	$37 billion**	$37 billion
Renewable energy subsidies	$208 billion	$845 billion

**excludes national-level state aid except for Important Projects of Common European Interest. **Congressional Budget Office estimate. Since these tax credits are not capped, they could be far higher. Credit Suisse estimates the total at closer to $250 billion. IRA figures exclude state- and local-level support and federal programs outside the IRA. Sources: Bruegel; European Automobile Manufacturer's Association; Rhodium Group. Credit Suisse, "US Inflation Reduction Act: A catalyst for climate action," Treeprint, 2022; Congressional Budget Office, "Estimated Budgetary Effect of Public Law 117-169, to Provide for Reconciliation Pursuant to Title II of S. Con. Res. 14, https://www.cbo.gov/publication/58455.*

These figures suggest that Europe's challenge is not a lack of financial or state resources, but its own fragmentation and the legacy effects of its overreliance on cheap Russian energy. Bruegel concludes that U.S.-EU differences are less about the sheer size of their respective efforts and more about how those initiatives are being rolled out. It judges IRA clean tech subsidies to be simpler, faster, and less fragmented than those in Europe, but argues that some discriminate against foreign producers, while most EU subsidies do not. IRA subsidies are focused mainly on mass deployment of current generation technologies, whereas EU-level support is more focused on spurring innovation and new technologies.

Lost in the transatlantic debate about competing transatlantic subsidies is the challenge posed by China. As President von der Leyen has said, "The true pressure, the unleveling of the playing field, is not our American friends, it's China – with massive hidden subsidies, with a lot of denial of access to our companies to the Chinese market and of course there is strategic shopping towards here, the European Union."[7] China invested $546 billion in the energy transition in 2022, nearly four times the amount the U.S. spent, according to Bloomberg.[8]

Going forward, the two parties would do well to manage those differences that do exist, avoid subsidy wars, mitigate their respective critical-material dependencies, and improve their attractiveness for green investments by proactively harnessing transatlantic synergies.

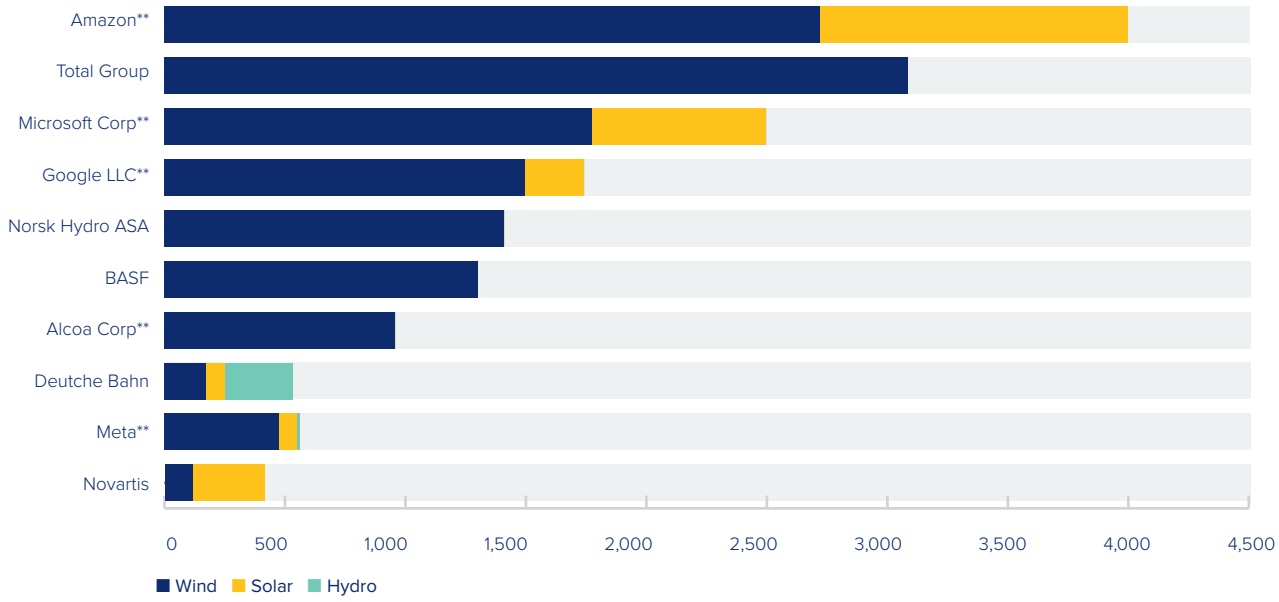
Empowering the Transatlantic Energy Innovation Economy

Transatlantic investment is not a zero-sum game, as we demonstrate throughout this book. That is particularly true regarding the transatlantic energy economy. U.S. and European firms are deeply embedded in each other's fossil-fuel and renewable energy markets – through trade, foreign investment, cross-border financing, and collaboration in research and development (R&D).[9] U.S. companies in Europe have become a driving force for Europe's green revolution, accounting for more than half of the long-term renewable energy purchase agreements signed in Europe since 2007 (Table 3). European companies are the leading source of foreign direct investment (FDI) in the U.S. energy sector (Table 4).

Global clean technology market value by 2030

$870 billion

Table 3. **Top Purchasers of Renewable Energy in Europe, 2008-2021** (Megawatts)



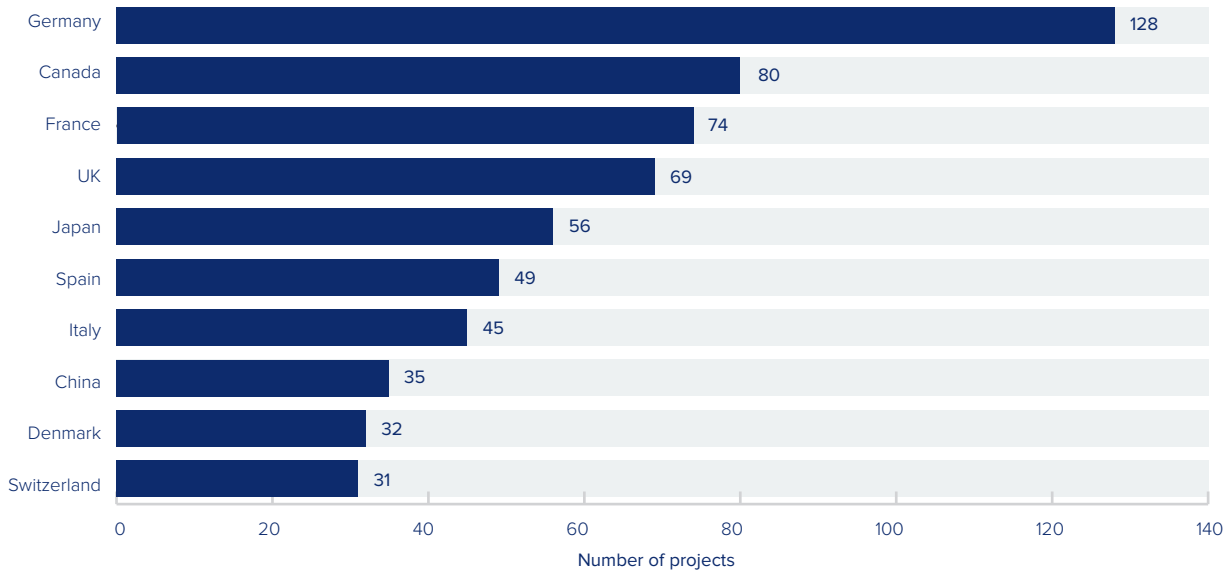
*** Companies with asterisks are U.S. companies and represented by darker shading of bars.*
Europe is the EU plus Norway, Iceland, Switzerland and the U.K.
Source: Bloomberg New Energy Finance.
Data as of February 2022.

U.S. companies in Europe have become a driving force for Europe's green revolution, accounting for more than half of the long-term renewable energy purchase agreements signed in Europe since 2007. European companies are the leading source of FDI in the U.S. energy sector.

The U.S. and EU share both interest and capacity to accelerate innovative frontier technologies that can provide abundant, affordable, clean energy and manufactured goods. The potential is significant. According to the International Energy Agency, by 2030 the global clean tech market will surpass the value of the oil market, rising from $122 billion to $870 billion.

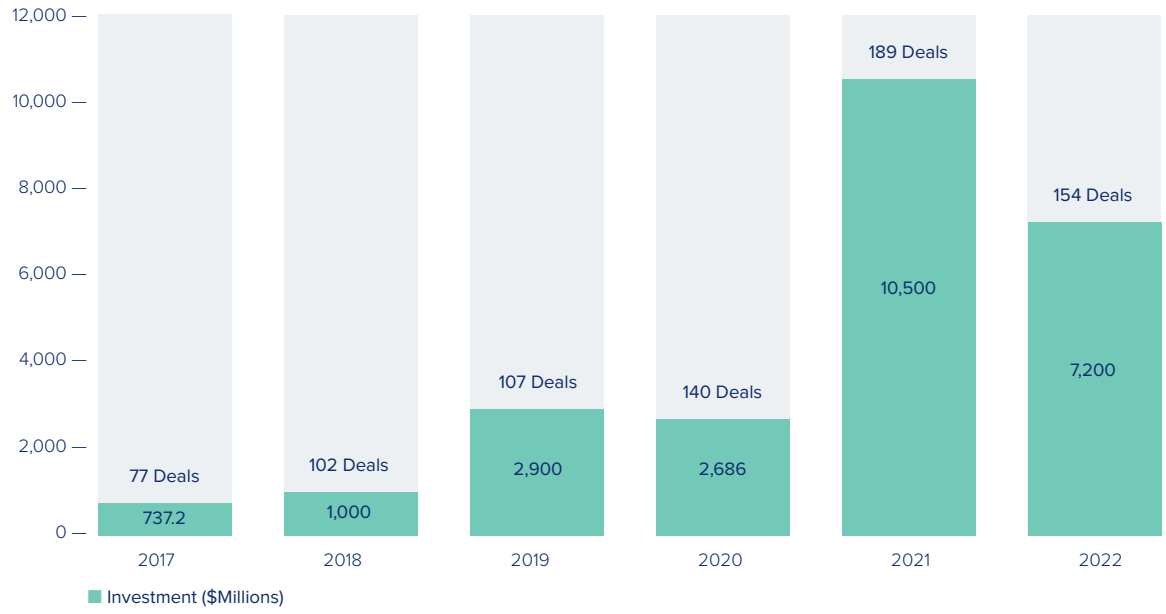
Transatlantic flows of risk capital are critical to cleantech innovation. EU investors are tapping into U.S. innovation and U.S. venture investors are providing scale-up capital for EU startups. Between 2017 and 2022, U.S. investors participated in 758 EU-based cleantech deals and EU investors joined 682 U.S.-based cleantech deals, according to CleanTech Group analysis (Tables 5 and 6). On average, U.S. and EU companies that received transatlantic investments reached growth stage, and received growth funding, faster than those that did not: 20% faster for EU-based companies; 8% faster for U.S.-based companies (Tables 7 and 8). Deal sizes for EU innovator investment rounds that included U.S. risk capital were significantly larger than those that did not involve a U.S. investor. 31% of EU deals that included U.S. investors were over $100 million. Only 8% of EU deals without a U.S. investor were over $100 million (Table 9).[10]

Table 4. **Top Sources of Inward FDI in U.S. Energy** (813 Total Announced Greenfield Projects, July 2011 - June 2021)



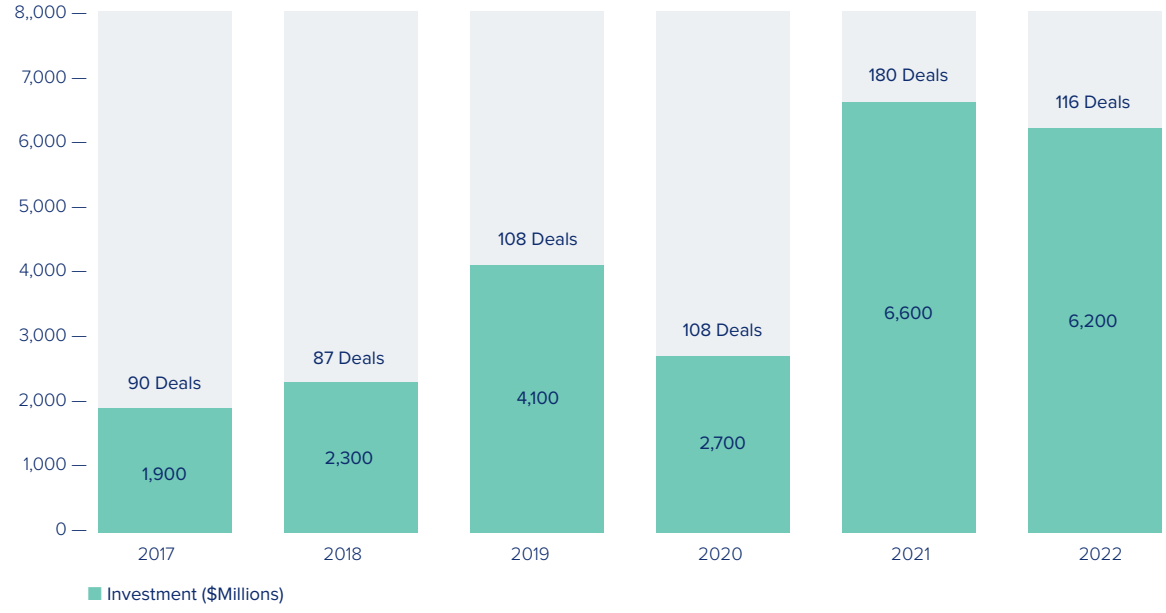
Source: SelectUSA, U.S. Department of Commerce.
Data as of August 2021.

Table 5. U.S. Investment in EU Innovators ($ of Investments Represent Total $ Raised in the Rounds By Innovator)



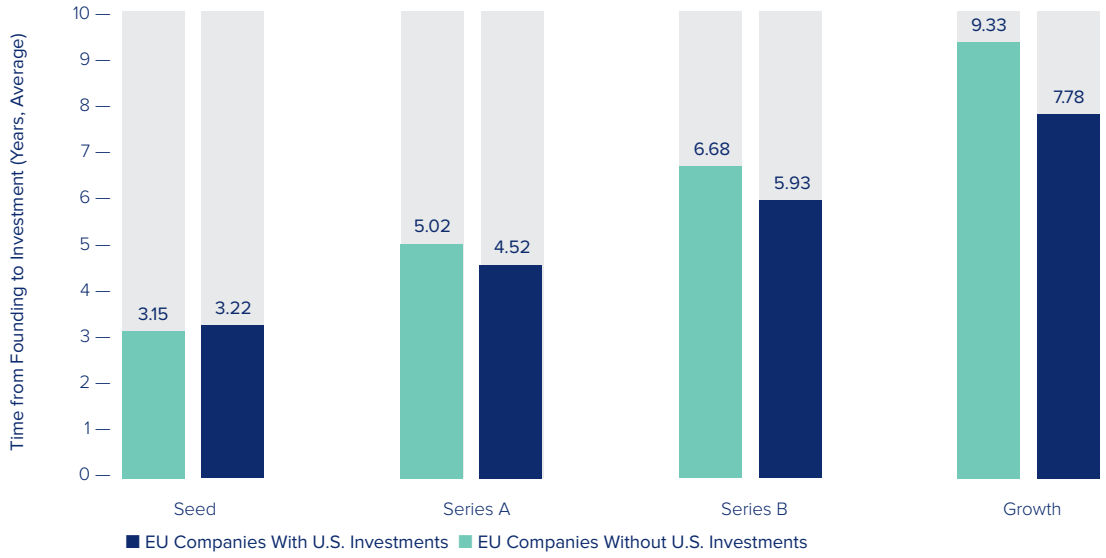
Source: Cleantech Group analysis.

Table 6. EU Investment in U.S. Innovators ($ of Investments Represent Total $ Raised in the Rounds By Innovator)



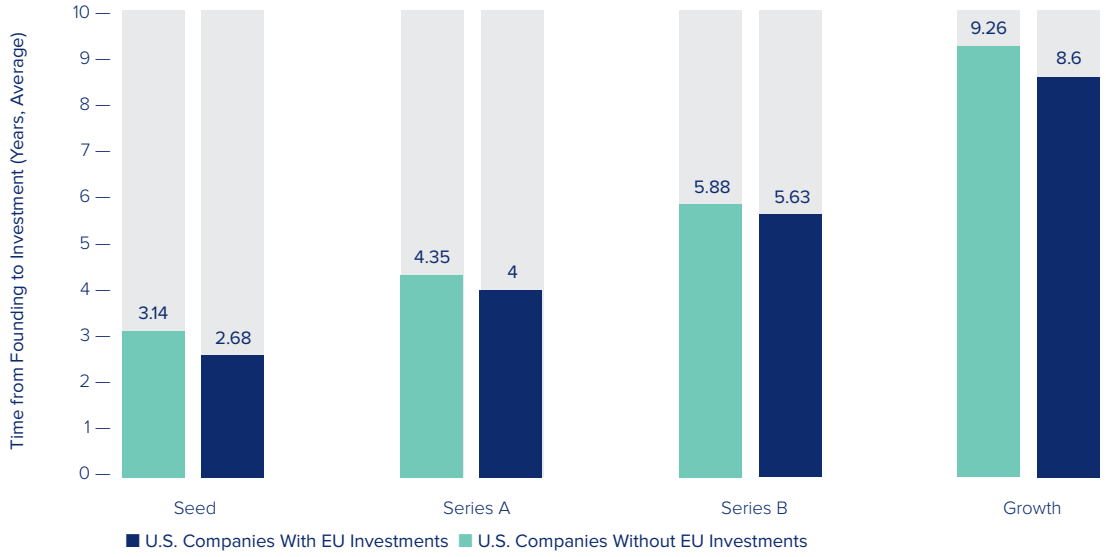
Source: Cleantech Group analysis.

Table 7. Average Growth Timeline for EU Companies With and Without U.S. Investments



Source: Cleantech Group.

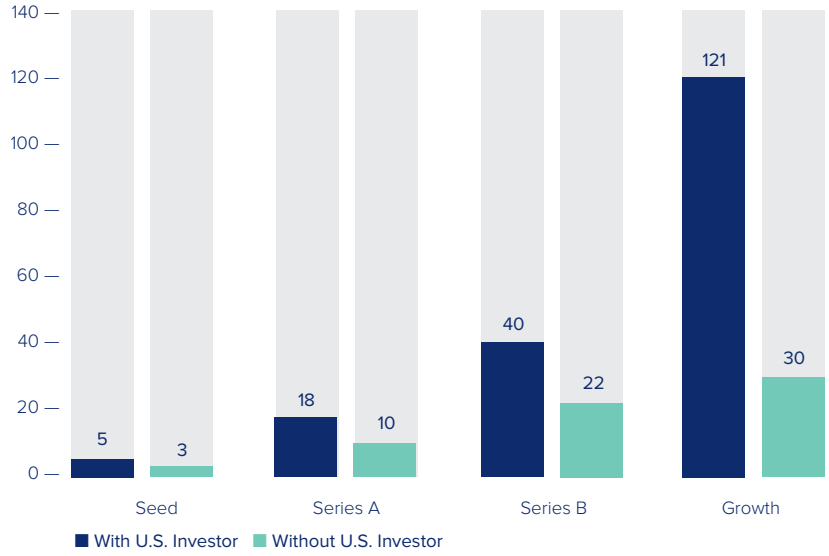
Table 8. Average Growth Timeline for U.S. Companies With and Without EU Investments



Source: Cleantech Group.

Significant transatlantic R&D synergies remain untapped.

Table 9. **VC Investment in EU Innovators: Average Deal Size** (2017-2022, $Millions)



31% of EU deals that included US venture investors were over $100mn

Only 8% of deals without a US investor were over $100mn for growth stage

Source: Cleantech Group.

Mind the Gaps

These figures underscore that transatlantic risk capital can be deployed successfully by venture investors to advance clean technologies at the innovation frontier. However, full transatlantic potential is being hampered by two major gaps along the innovation lifecycle.

First, the voices of innovation are absent in transatlantic policy discussions. There is no place for cleantech innovators and investors to inform and exchange views with U.S. and EU officials. As a result, significant transatlantic R&D synergies remain untapped. The U.S. and the EU have separately prioritized R&D focus areas between now and 2040-2050. Yet CleanTech Group research reveals that many official priorities and the actual state of innovation are not fully aligned. Innovators are ahead of governments in some areas, and they are exploring other breakthrough technologies that are not on official radars. Neither side of the Atlantic alone is likely to develop, fund, and scale technologies needed to reach net-zero targets at sufficient speed. The voices of innovators and investors can help inform R&D priorities and generate synergies between the U.S. and EU ecosystems to accelerate innovation, funding and scale-up to commercialization.

Second, large corporations and other demand owners that have made net-zero pledges need access to relevant innovators who have been accelerated by risk capital, and who are ready to scale up to meet net-zero targets as fast as possible. Yet access is fragmented and does not take advantage of transatlantic innovation or the potential to scale faster through coordinated engagement. Easier access to innovation could increase the pool of potential solutions, and innovation scaled up on one side of the Atlantic could quickly spur growth on the other.

Time for TACTA

These gaps could be addressed, and transatlantic synergies catalyzed more effectively, if the U.S. and the EU moved forward on the pledge made at the June 2021 U.S.-EU Summit to "work towards a Transatlantic Green Technology Alliance that would foster cooperation on the development and deployment of green technologies, as well as promote markets to scale such technologies." At the time, European Commission President Ursula von der Leyen said the two parties would join forces to "enable breakthrough technologies and amazing innovations to be competitive on the market."[11]

Almost two years later, little progress has been made, despite the tremendous potential – and the urgency – of such an initiative. It's time for TACTA: a Transatlantic Clean Technology Alliance.[12] As a platform for officials, demand owners, and the investor/innovation community to share perspectives and identify priorities, TACTA could highlight and support synergies among existing EU and U.S. cleantech efforts, identify and close gaps, and prioritize innovations that reduce, rather than exacerbate their critical materials dependencies.

Notes

1 European Council, "Where does Europe's gas come from?" February 7, 2023, https://www.consilium.europa.eu/en/infographics/eu-gas-supply/; Georgi Kantchev and Joe Wallace, "Europe Cuts Addiction to Russian Energy, Yet Fuel Scramble Continues," *Wall Street Journal*, February 3, 2023.
2 Jason Bordoff, "Europe Is Wrong to Blame the U.S. for Its Energy Problems," *New York Times*, December 2, 2022; Ben Lefebvre, "How American Energy Helped Europe Best Putin," *Politico*, February 23, 2023.
3 Szymon Kardaś, "Conscious uncoupling: Europeans' Russian gas challenge in 2023," European Council on Foreign Relations, February 13, 2023, https://ecfr.eu/article/conscious-uncoupling-europeans-russian-gas-challenge-in-2023/#:~:text=Together%2C%20these%20measures%20mean%20the,the%20lowest%20level%20in%20history; Andrew Duehren, Laurence Norman and Joe Wallace, "G-7 Expands Sanctions on Russian Oil Industry," *Wall Street Journal*, February 3, 2023; Paul Wightman, "U.S. Crude Oil Exports to EU Support WTI as Global Benchmark," CME Group, February 1, 2023, https://www.cmegroup.com/openmarkets/energy/2023/u-s--crude-oil-exports-to-eu-support-wti-as-global-benchmark.html; Sheela Tobben and Devika Krishnar Kumar, "Europe Becomes Top Market for US Crude as War Upends Trade," Bloomberg, July 15, 2022;
4 "Brian Deese, John Podesta and Jake Sullivan on the Inflation Reduction Act," *The Economist*, January 24, 2023.
5 Michael Hüther and Jürgen Matthes, "Is the U.S. Inflation Reduction Act Hurting the German Economy? An Objection to Exaggerated Claims," Atlantik-Brücke, January 18, 2023.
6 Under the plan, national state aid cannot exceed €100 million, or €300 million for poor regions per project. See Bruegel.
7 Cited in *Politico* Brussels Playbook, January 27, 2023.
8 Dave Jones, "European Electricity Review 2023," Ember, January 31, 2023, https://ember-climate.org/insights/research/european-electricity-review-2023/.
9 Zach Myers, "Turning down the heat on transatlantic tech," Centre for European Reform, January 31, 2023.
10 CleanTech Group, "Transatlantic collaboration in cleantech," forthcoming.
11 The White House, "US-EU Summit Statement," June 15, 2021; Karl Mathiesen and Zack Colman, "4 sore points between the US and EU on climate," *Politico*, June 15, 2023.
12 For more, see Daniel S. Hamilton, "It's time to forge a transatlantic clean technology alliance," *The Hill*, June 27, 2022, https://thehill.com/opinion/technology/3538332-its-time-to-forge-a-transatlantic-clean-technology-alliance/, and "Zeit für transatlantische Technologieallianz," *Frankfurter Allgemeine Zeitung*, June 30, 2022, https://transatlanticrelations.org/wp-content/uploads/2022/07/20220630_F.A.Z._Seite-8.pdf.

5

The Digital Drivers of the Transatlantic Economy

More data was generated over the last two years than in the entirety of human history.

The crisis has sped the adoption of a wide range of digital technologies by three to four years

The Covid-19 pandemic was a digital turbocharger. It accelerated the adoption of a wide range of digital technologies by three to four years. The digital experiences most of us gained are likely to have a lasting effect on the ways we work, move, buy, sell, learn and play.

As lockdowns ended, the extraordinary digital boom subsided. Companies adjusted once more as people again began to travel and return to shops, cafes and restaurants. Firms battered by the pandemic saw their fortunes improve. The food, travel and hospitality industries began to recover. Physical stores once again beat electronic commerce in the United States and many other countries in 2021 and 2022.[1]

Now, in a reversal of fortunes, once thriving digitally-driven companies are struggling to survive. Companies previously on hiring sprees have been forced to shed workers and cut costs. The combined value of the five biggest tech companies – Alphabet, Amazon, Apple, Meta and Microsoft – fell by nearly $3.7 trillion last year. Global information communication technology (ICT) spending fell to $4.38 trillion – a slight contraction of 0.2% from 2021, but a rare instance of companies deciding to spend less on digital transformation. Gartner expects ICT spending to increase 2.4% in 2023, less than half earlier estimates, as companies face inflationary pressures, higher interest rates, currency fluctuations, and weaker consumer and business spending.[2]

In most cases, digitally-driven companies are simply readjusting to post-pandemic realities and sharpening their focus on opportunities and challenges to come. Despite major job cuts, most digitally-driven companies still have more workers than they did when the pandemic began. The ten companies announcing the largest layoffs have only undone about 10% of the jobs they created during the pandemic.[3] The ICT sector overall continues to record net employment gains, and scores of thousands of jobs remain unfilled.

In short, the digital jet stream may no longer be stratospheric, but it is still flying high. More data was generated over the last two years than in the entirety of human history. By 2025, global data creation is projected to grow to more than 180 zettabytes. That's 180 followed by 21 zeros – over 2 billion times the Internet's size in 1997. Only about 2% of that data survives year-to-year. Still, 2% of 180 zettabytes is huge. By 2026, monthly global data traffic is expected to surge to 780 exabytes – more than three times data usage rates in 2020. [4]

Global internet bandwidth has tripled since 2017, even as growth slowed from a torrid pandemic-driven surge of 34% in 2020 to a more "normal" pace of 29% in 2021.[5] Over 5 billion people typically spend more than 40% of their waking life online.[6] More than 2 billion digital payments are made every day.[7] This year, 1 in 2 companies will generate more than 40% of their revenues from digital products and services.[8] GSMA Intelligence forecasts that 37.4 billion devices will be connected to the internet by 2030, up from 15.1 billion in 2021.[9] The global Internet of Things (IoT) market, valued at $690.3 billion in 2021, is projected to grow to $1.5 trillion in 2026 and $1.85 trillion in 2028.[10]

Over the next three years, global spending on digital transformation is forecast to reach $3.4 trillion, with a five-year compound annual growth rate (CAGR) of 16.3%.[11] The United States is the largest market for such spending, accounting for nearly 35% of the worldwide total. Western Europe is the second largest region, accounting for nearly a quarter of all spending on digital transformation.[12] The World Economic Forum estimates that 70% of the new value created in the whole economy over the next ten years will be digitally enabled.[13]

Digital Twinning, Digital Money, and Generative AI

For the transatlantic economy a number of digital transformations bear watching. In previous surveys, we have discussed opportunities for small- and medium-sized enterprises, the evolution of 3-D printing, the emergence of Web3, and the promise of the connected factory. Each of these developments remains significant.

We also discussed the metaverse, which much popular commentary treats as a fusion of virtual gaming, social networking, and entertainment. Substantial additional economic value, however, is likely to be generated by the "industrial" or "enterprise" metaverse, a world in which the distinctions between physical and digital work environments blend. In that world, nearly any

aspect of work could be performed and tested digitally before it is done physically. Employees could train on 3-D virtual replicas of equipment before using physical tools. Executives could employ more precise tools to predict what's next for their organization. As McKinsey has noted, this world is still aspirational. But its pathfinder is already here: digital twinning technology.[14]

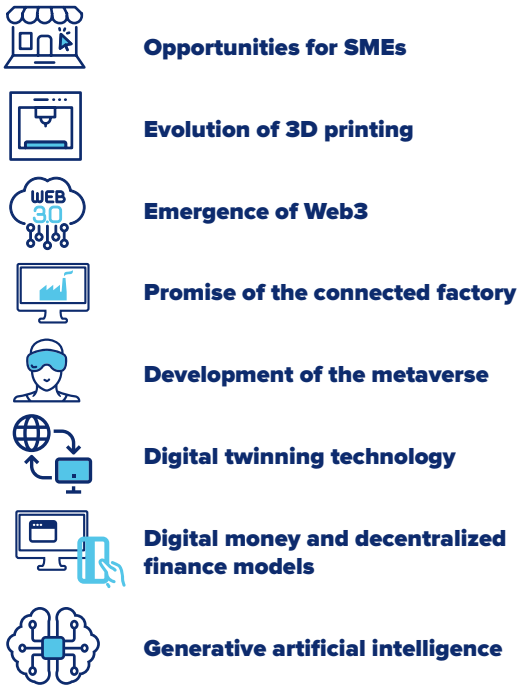
Digital twins are already being employed in fields ranging from architecture, engineering and construction, hospitals and medical facilities, and automobiles to insurance, banking, and wastewater management. The digital twin market is forecast to grow from $6.9 billion in 2022 to $126 billion in 2030.[15]

In our annual surveys, we have also noted the disruptive potential of digital money. Roller-coaster cryptocurrency markets hit an all-time high of $3 trillion in November 2021 before crashing to half that size in February 2022. They were further rocked by the implosion of the TerraUSD stablecoin and the collapse of its twin coin Luna in May, the failure of crypto hedge fund Three Arrows Capital in June and Celsius Network in July, and then the collapse of the FTX exchange and related crypto funds in November. The result is a new "crypto ice age".[16]

At the same time, nine out of ten of the world's central banks are working to create digital versions of their own currencies. Some are already in circulation, such as The Bahamas' Sand Dollar and Nigeria's eNaira. China has been testing a digital renminbi, or e-CNY; India has launched a digital scheme; the European Central Bank plans a pilot phase for a "digital euro" in 2023; and Mexico is slated to launch a "digital peso" by 2024. The G20 has prioritized cross-border payments using central bank digital currencies, and experiments led by the Bank for International Settlements have shown that such platforms could lead to faster, cheaper, and more transparent cross-border payments. The test now is to scale such experiments to real-world use, and to address ongoing concerns regarding privacy, governance, legal uncertainties, and whether such digital linkages could lead to more rapid contagion effects in the event of a digital financial crisis.[17]

Given the dollar's central role in the international monetary system, prospects for a digital dollar are central to any consideration of central bank digital currencies. The U.S. Treasury and the Federal Reserve have stated that the issue is important, but not necessarily urgent. "It's more important to get it right than to be first" says Fed Chairman Jerome Powell.[18]

Digital transformations impacting the transatlantic economy



Opportunities for SMEs

Evolution of 3D printing

Emergence of Web3

Promise of the connected factory

Development of the metaverse

Digital twinning technology

Digital money and decentralized finance models

Generative artificial intelligence

Even as digital transformations envelop all of these fields, the new digital buzz is all about generative artificial intelligence (AI), which is now giving computers the ability to enter realms once reserved for humans. They can churn out original prose, images, sounds and even code in response to human prompts. Open AI's ChatGPT, Google's LaMDA and Bard, and AI models such as Stable Diffusion, DALL·E 2, and GPT-3, to name a few, promise to open these general-purpose technologies beyond specially-trained developers to potentially all users, ushering in a next new wave of digital transformation equivalent in impact to the introduction of the smartphone. Hundreds of start-ups are engaged in the field, and venture capital is pouring in, despite the relative digital investment downturn, and ongoing concerns related to bias, safety, and mis- and disinformation.[19]

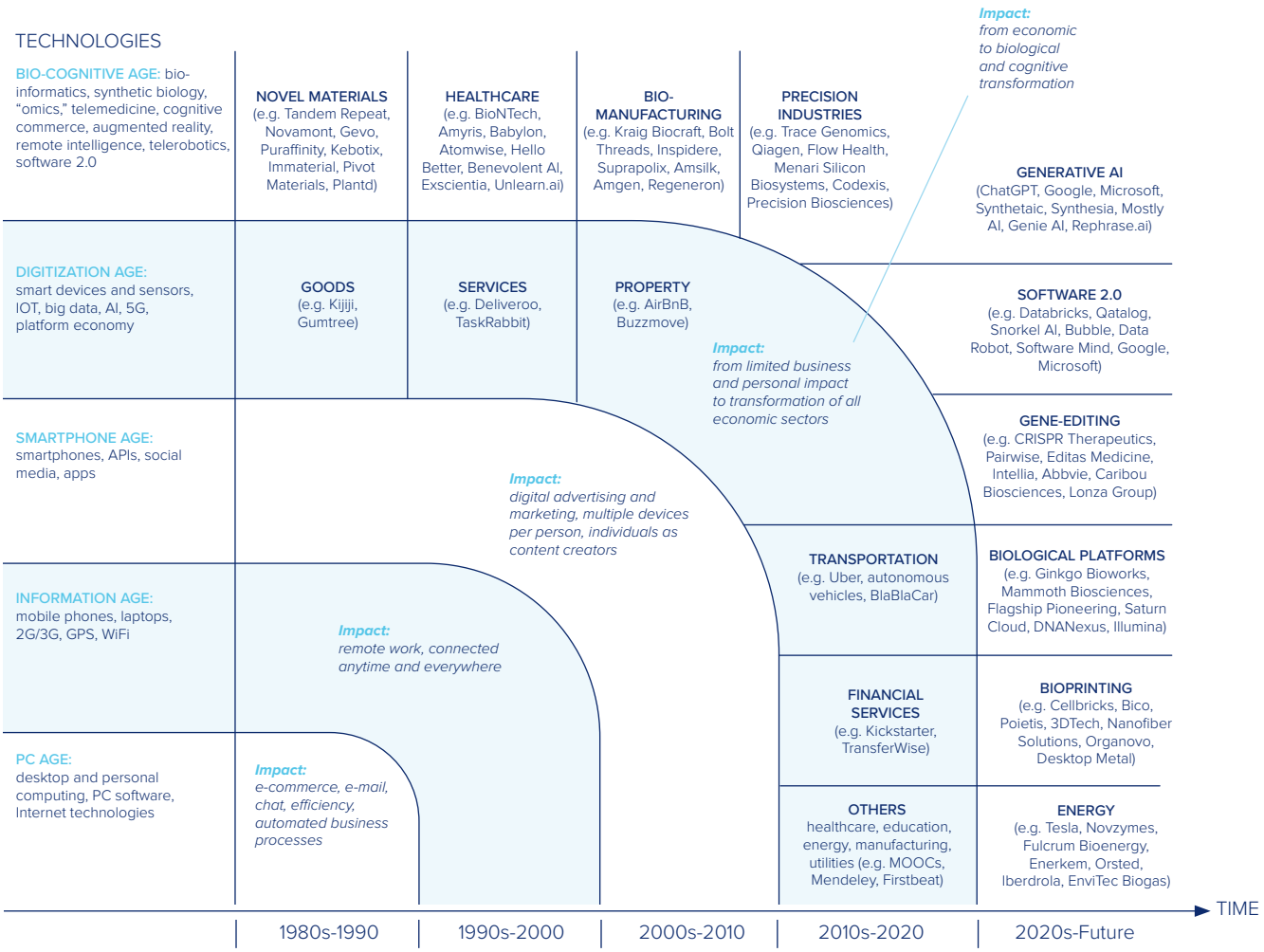
Stepping Into The Bio-Cognitive Age

Even as we grapple with the possibilities and challenges posed by digital transformation, breakthrough advances in the cognitive and biological sciences are combining to usher in a Bio-Cognitive Age, led by pioneering companies on both sides of the Atlantic.[20] Table 1 offers an updated view of this digital frontier.

The pandemic was a major accelerant of the biological revolution. A decade ago, mRNA vaccines were a dream. In 2020, they changed the world. BioNTech, Moderna, Merck, and other companies are already applying mRNA technology to deal with diseases such as malaria, tuberculosis, and HIV. In the future, mRNA drugs could be used for allergies, autoimmune conditions, individualized cancer therapies, regenerative medicine, and for a wide variety of illnesses, from flu and heart disease to yellow fever and the Zika virus. BioNTech believes that in 15 years, one-third of all newly approved drugs will be based on mRNA.[21]

Many biotech firms have also been affected by post-pandemic adjustments. Many face tighter capital inflows and have had to lay off workers. Nonetheless, the current stepback is more a filtering process and course correction than a secular downturn. Digital transformations continue to redefine health in all areas of life. 3D printing is poised to revolutionize reconstructive surgery, from knee replacements to new ears. The rapid advancement of genome-editing techniques holds much promise for the field of human gene therapy. Telemedicine, telepresence, and telesurgery are transforming medical techniques and generating greater cross-border trade in healthcare services.[22]

Table 1 The Expanding Digital Frontier



Sources: GSMA Intelligence; McKinsey Global Institute; Author's own estimates.

By 2025, 40% of the global datasphere will be in health – the largest of any sector or industry. This explosion of genetic and health data – and increasing abilities to process it – hold significant potential for scientific and medical achievement worldwide, assuming the ability to transfer data across borders, subject to certain privacy and data protection standards, is not undermined. The digital health industry is booming, with some estimates valuing the sector at more than $550 billion by 2027 and 16.5% CAGR.[23]

Biological breakthroughs are proceeding alongside, and sometimes interacting with, cognitive advances, led by the transformation of software and artificial intelligence. AI technologies are helping companies supercharge their online advertising, cut energy costs, predict customer behaviors, anticipate stock market movements, improve supply chains, build websites and fill in tax forms. They are approaching or surpassing human levels of performance in vision, image and speech recognition, language translation, skin cancer classification, breast cancer detection, and other domains. Over the next few years, major advances in deep learning and foundation models will lead to even more impressive AI-based applications. Over half of European and U.S. companies have adopted AI applications in their operations.[24]

The potential of transatlantic innovation is underscored by London-based AI company DeepMind, owned by Google parent Alphabet, which has used artificial intelligence to predict the shape of almost every known protein, a breakthrough that will significantly accelerate the time required to make biological discoveries.[25] Recent findings show that AI can slash early drug discovery timelines by four years, and generate cost savings of 60%.[26] BioNTech recently purchased UK AI start-up InstaDeep to augment its efforts to use AI to design next-generation immunotherapies.[27] AI-designed drugs have entered human testing. The healthcare AI-powered tools market is expected to exceed $34 billion by 2025.[28]

While AI's positive effects could be revolutionary, it has also generated substantial concern about potential risks, ranging from automation of jobs, violations of privacy, discrimination, and the spread of fake news, to authoritarian social control and to autonomous weapons.[29] The EU and the United States have each advanced legislation to address AI risks. The EU's AI Act could go into effect in 2024; the U.S. Algorithmic Accountability Act has yet to pass the Congress. The two parties have used their Trade and Technology Council (TTC) to underscore their opposition to AI that does not respect human rights, and to highlight their joint concern "that authoritarian governments are piloting social scoring systems with an aim to implement social control at scale".[30] At the December 2022 TTC Ministerial meeting, the two parties issued a first Joint Roadmap on Evaluation and Measurement Tools for Trustworthy AI and Risk Management. They are also developing a pilot project to assess the use of privacy-enhancing technologies and synthetic data in health and medicine, and to conduct a joint study on the impact of AI on the workforce.[31]

Share of health in the global datasphere by 2025

40%

Digital Apples and Oranges

Given data's peculiar qualities, economists and governments have struggled to devise quality metrics to measure the digital economy. Some recent efforts are relevant to this year's survey.

First, the U.S. Bureau of Economic Analysis (BEA) has revised its definition of the digital economy to include four major types of goods and services: supportive and enabling infrastructure; electronic commerce; priced digital services charged to customers; and the annual budget of U.S. federal nondefense agencies whose services are directly related to supporting the digital economy. This definition begs many questions, including why the sizable, digitally-intense U.S. defense sector would be excluded. Nonetheless, based on these metrics, the BEA estimates that the U.S. digital economy accounted for $3.70 trillion of gross output, $2.41 trillion of value added (10.3% of U.S. GDP), $1.24 trillion of compensation, and 8 million jobs. Growth of 9.8% in 2021 greatly outpaced growth in the overall economy of 5.9%, and U.S. digital economy growth of 5.6% between 2016 and 2021 far exceeded the 1.6% growth of the overall U.S. real economy.[32]

Table 2. The U.S. Digital Economy: Output and Growth

	Current-Dollar Gross Output ($Billion), 2021	Share of Digital Economy, 2021	Growth, 2020-2021	Growth, 2016-2021
Priced digital services	$1,590	43.10%	9.8%	4.8%
Supportive or enabling infrastructure	$1,170	31.50%	11.1%	7.2%
E-commerce (B2B and B2C)*	$9.42	25.40%	8.7%	5.1%
Federal nondefense digital services	$0.42	0.01%	-0.9%	-1.4%
Total Digital Economy	**$3,700**		**10.0%**	**5.6%****

**B2B: Business-to-business. B2C: Business-to-consumer.*
***U.S. real economy growth 2016-2021: 1.6%.*
Source: U.S. Bureau of Economic Analysis.

The Purpose-Driven Digital Enterprise

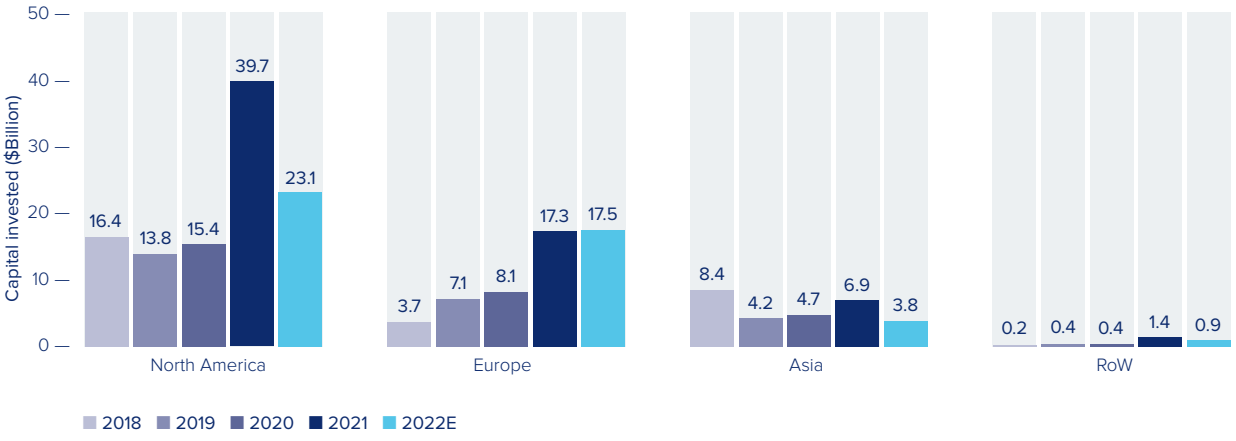
A second lens is offered by European venture capital firm Atomico, which looks more narrowly at information technology and the manufacture of computer, electronic and optical products. It finds that the digital economy (so defined, and excluding biotech) contributed 8.8% of gross value added to the U.S. economy, and 6.3% to the European economy, in 2020.[33]

Within Europe, of course, countries and regions are at different stages of digital maturity. Atomico notes, however, that they all have experienced a rapid growth in value over the past five years. Countries like Sweden, Estonia and Finland are on par with the United States, or close to achieving the same level of gross-value-added contribution from the digital economy. The UK, France, and Germany still capture the greatest share of total ecosystem value, but other regions are growing fast. The total value of private and public tech companies from Central and Eastern Europe, Atomico notes, has reached more than $74 billion, having grown almost 5 times since 2017.[34]

Moreover, total investment in the European digital economy reached a record $100 billion in 2021, and was on track to reach $85 billion in 2022 – the second highest level ever invested, and more than 8 times the level invested in 2015. What's more, investors are sitting on $84 billion worth of dry powder to deploy, up almost 3 times in the last five years.[35]

A particularly bright light on Europe's innovation landscape are purpose-driven digital companies, which Atomico defines as those trying to

Table 3. Capital invested in purpose-driven digital companies by year and region, 2018-2022*



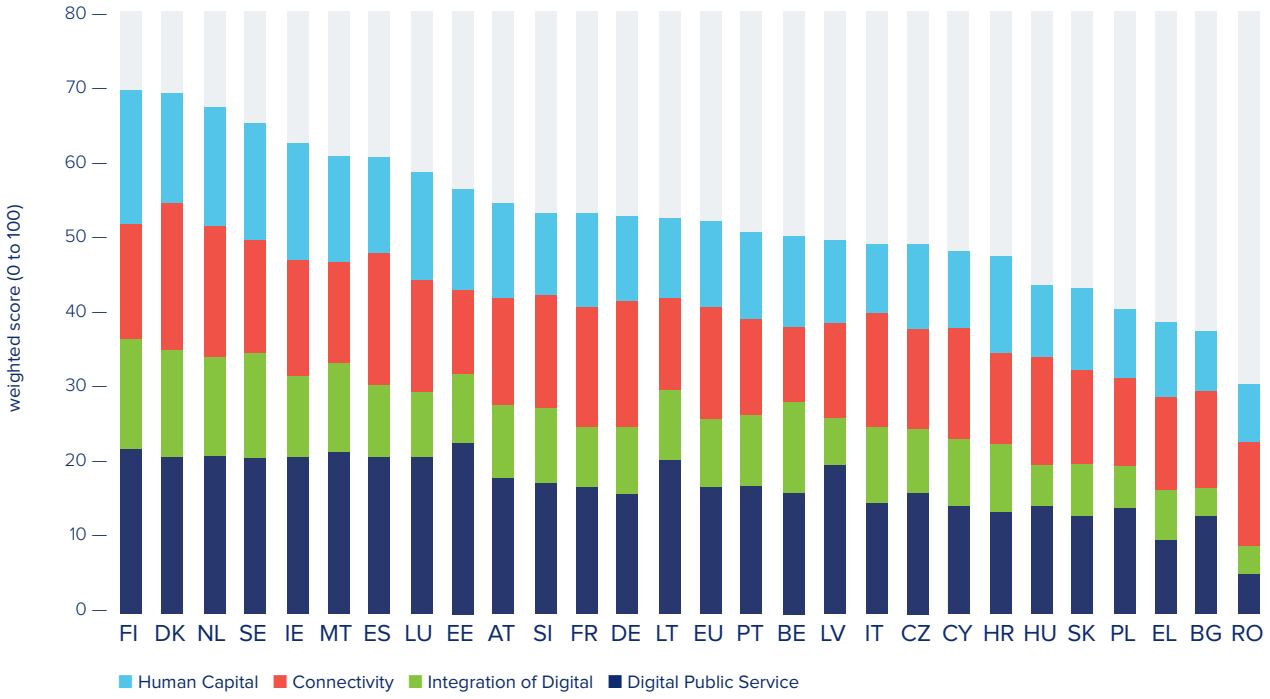
**2022 is annualized based on actuals up to October and annualized on the basis of the three months of August to October. Source: Atomico, State of European Tech 2022, https://stateofeuropeantech.com/1.european-teach-a-new-reality/1.2-tech-motor-for-progress#C1-2-purpose-driven-tech-on-the-rise-again.*

address at least one of the UN's 17 Sustainable Development Goals (SDGs). Over the past five years, investment in these purpose-driven companies has increased at a huge scale globally, but largely in North America and in Europe. Investments in these companies in North America, while still high, flagged somewhat in 2022, whereas investor appetite remained strong in Europe. Capital invested in Europe in these companies has topped $54 billion since 2018, and Europe now accounts for over half (51%) of all investment going into early-stage (up to $20 million) purpose-driven digital companies. This is far greater than Europe's 23% share of overall global investment. For the earliest stages rounds of less than $5 million, Europe's share is even more significant, equating to 69% of all capital invested globally. At later stages, Europe's share of later-stage rounds of $100 million+ global investment into purpose-driven tech companies is 41% – lower, but still significant.

The Digital Economy and Society Index

The European Union takes a different tack. Its flagship annual assessment, the Digital Economy and Society Index (DESI), tracks the digital progress of EU member states according to four metrics: human capital; connectivity; integration of digital technology; and digital public services. Based on this assessment, Finland, Denmark, the Netherlands and Sweden have the most advanced digital economies in the EU, followed by Ireland, Malta and Spain. Romania, Bulgaria and Greece have the lowest DESI scores.

Table 4. The EU Digital Economy: Comparing Member States



Source: Digital Economy and Society Index 2022, European Commission, https://digital-strategy.ec.europa.eu/en/policies/desi.

How Prepared are Europe and the United States for Digital Transformation?

A global assessment is offered by the 2022 Network Readiness Index, which measures how prepared countries are to leverage the opportunities offered by technological innovation. It does so by looking at the state of technology infrastructure, the ability of individuals, businesses, and governments to use ICT productively, how conducive the national environment is for a country's participation in the network economy, and the economic, social, and human impact of a country's participation in the network economy. Based on these metrics, Europe and North America represent 8 of the top 10 countries, and 18 of the top 25, when it comes to technology readiness and adoption (Table 5). Singapore and South Korea were the lone Asian countries in the top ten.[36]

Table 5. **Top Ten Network-Ready Countries, 2022**

Country	NRI Rank	Technology	People	Governance	Impact
United States	1	1	2	7	20
Singapore	2	4	4	10	2
Sweden	3	8	5	5	1
Netherlands	4	3	14	4	4
Switzerland	5	2	11	12	5
Denmark	6	11	7	2	7
Finland	7	13	6	3	3
Germany	8	7	9	14	8
Republic of Korea	9	14	1	22	13
Norway	10	12	12	1	14

Source: Soumitra Dutta and Bruno Lanvin, eds., The Network Readiness Index 2022 (Washington, DC: Portulans Institute, 2022), https://networkreadinessindex.org.[37]

Even though "digital globalization" evokes the image of a seamless global marketplace, digital connections are "thicker" between some continents and "thinner" between others – and they are "thickest" between North America and Europe.

Five Lenses on the Evolving Transatlantic Digital Economy

Due to these apples-and-oranges approaches, it is difficult to come up with a clear estimate of the overall size or value of the transatlantic digital economy. Our interest in this annual survey, however, is more on how North America and Europe connect, rather than on how they compare. With that in mind, we present five ways to look at the transatlantic digital economy. These metrics are not mutually exclusive; they are best understood as different lenses through which one can better understand the importance of transatlantic digital connections.

Together, these five metrics convey one clear message: even though "digital globalization" evokes the image of a seamless global marketplace, digital connections are "thicker" between some continents and "thinner" between others – and they are "thickest" between North America and Europe.

1. Cross-Border Trade and Investment in Digital Services and Digitally-Enabled Services

Digitalization is changing the scale, scope and speed of trade. It has lowered shipping and customs processing times. It offers alternative means of payment and finance. It has boosted trade in software design over trade in final products. It has reduced the cost of creating, copying and accessing text, video content and music. The result: trade in data, digital services, and intellectual property is booming, whereas trade in many traditional goods and services has flagged. According to McKinsey, between 2010 and 2019, trade flows linked to knowledge grew twice as fast as those of traditional goods.[38]

Digitalization has changed the very nature of trade. It blurs the distinction between trade in goods and services. Automakers are now also services providers; online retailers are also manufacturers. 3D-printing generates products that are a mix of goods and services. Digitalization has enhanced our ability to access goods and services without owning them.[39]

The digital economy is dominated by services. Many services sectors that were once non-tradable – because they had to be delivered face-to-face – have become highly tradable – because they can now be delivered over long distances.[40]

Two metrics offer us a clearer picture of transatlantic connections in digital services. A narrow view can be had by looking at cross-border ICT services, or digital services as shorthand, which are services used to facilitate information processing and communication.[41] A broader view can be taken by looking at services that can be, but are not necessarily, delivered remotely over ICT networks. These are called digitally-enabled or digitally-deliverable services: They include digital services as well as "activities that can be specified, performed, delivered, evaluated and consumed electronically."[42] Identifying potentially ICT-enabled services does not tell us with certainty whether the services are actually traded digitally. But the U.S. Commerce Department notes that "these service categories are the ones in which digital technologies present the most opportunity to transform the relationship between buyer and seller from the traditional in-person delivery mode to a digital one," which means a digital transaction is likely and thus can offer a rough indication of the potential for digital trade. [43]

Growth in digitally-deliverable services trade cushioned the pandemic's blow to overall services trade. Global exports of digitally-deliverable services grew from around $3.3 trillion in 2019 to $3.8 trillion in 2021. This 8.4% growth helped to offset a sharp 11.8% decline in exports of other services during this pandemic period. As a result, overall services trade fell by 3.5%, much less than would otherwise have happened. Digitally-deliverable services accounted for about 63% of global services exports.[44]

Germany was the top global importer of digital services in 2021, followed by the United States and France. Ireland was the top global exporter of digital services, followed by India and China (Table 6).

Considering the broader class of digitally-deliverable services, the United States was the largest global exporter and importer in 2021 (Table 7). As with digital services, most of the top 10 exporters and importers of digitally-deliverable services in 2021 were developed countries.

Table 6. Digital Services Trade: Top Exporters and Importers, 2021

Exporters	Value ($Billions)	Importers	Value ($Billions)
1. Ireland	197.7	1. Germany	45.4
2. India	81.7	2. United States	39.2
3. China	77.0	3. France	26.3
4. United States	52.8	4. Singapore	25.2
5. Germany	37.2	5. Japan	24.0
6. United Kingdom	34.0	6. Netherlands	21.4
7. Israel	24.8	7. United Kingdom	14.7
8. France	21.2	8. Belgium	13.7
9. Singapore	18.2	9. India	13.6
10. Sweden	16.9	10. Italy	12.7

Source: UNCTAD.

Table 7. Digitally-Deliverable Services Trade: Top Exporters and Importers, 2021

Exporters	Value ($Billions)	Importers	Value ($Billions)
1. United States	613.0	1. United States	350.4
2. United Kingdom	353.4	2. Ireland	323.8
3. Ireland	316.1	3. Germany	212.5
4. Germany	242.2	4. United Kingdom	170.2
5. China	194.5	5. Netherlands	165.0
6. India	185.2	6. China	164.8
7. Netherlands	164.2	7. Japan	152.5
8. France	163.7	8. France	148.8
9. Singapore	148.4	9. Singapore	135.2
10. Luxembourg	125.4	10. Switzerland	122.8

Source: UNCTAD.

Ireland's high rankings underscore both its preferred location for many multinational companies, and its high reliance on digital trade. Its imports of digitally-deliverable services were equivalent to 64%, and its exports 63%, of its GDP.

Digitally-enabled services are not just exported directly, they are used in manufacturing and to produce goods and services for export. Over half of digitally-enabled services imported by the United States from the European Union (EU) is used to produce U.S. products for export, and vice versa, thus generating an additional value-added effect on trade that is not easily captured in standard metrics.[45]

In 2021, U.S exports of digital services totaled $89.4 billion, while U.S. digital services imports were $51.2 billion, resulting in a trade in a U.S. digital services trade surplus of $38.2 billion. U.S. trade in digitally-deliverable services was much higher: exports of $613.0 billion and imports of $350.4 billion. The resulting U.S. digitally-deliverable trade surplus of $262.6 billion was $41 billion (18%) more than in 2020.[46]

The UK was the U.S.' top overall trading partner in digitally-deliverable services, and its largest source of digitally-deliverable services imports. Ireland maintained its position as the top recipient country for U.S. exports of digitally-deliverable services for the third year in a row. Both countries also registered the largest increases in both imports and exports of digitally-deliverable services with the United States.[47]

In terms of world regions, Europe and the U.S. remain each other's main commercial trading partners in digitally-deliverable services. In 2021, the United States exported $283 billion in

digitally-deliverable services to Europe – more than double what it exported to the entire Asia-Pacific region, and more than combined U.S. exports of digitally-deliverable services to the Asia-Pacific ($136 billion), Latin America and other Western Hemisphere ($111 billion), and the Middle East ($17 billion).

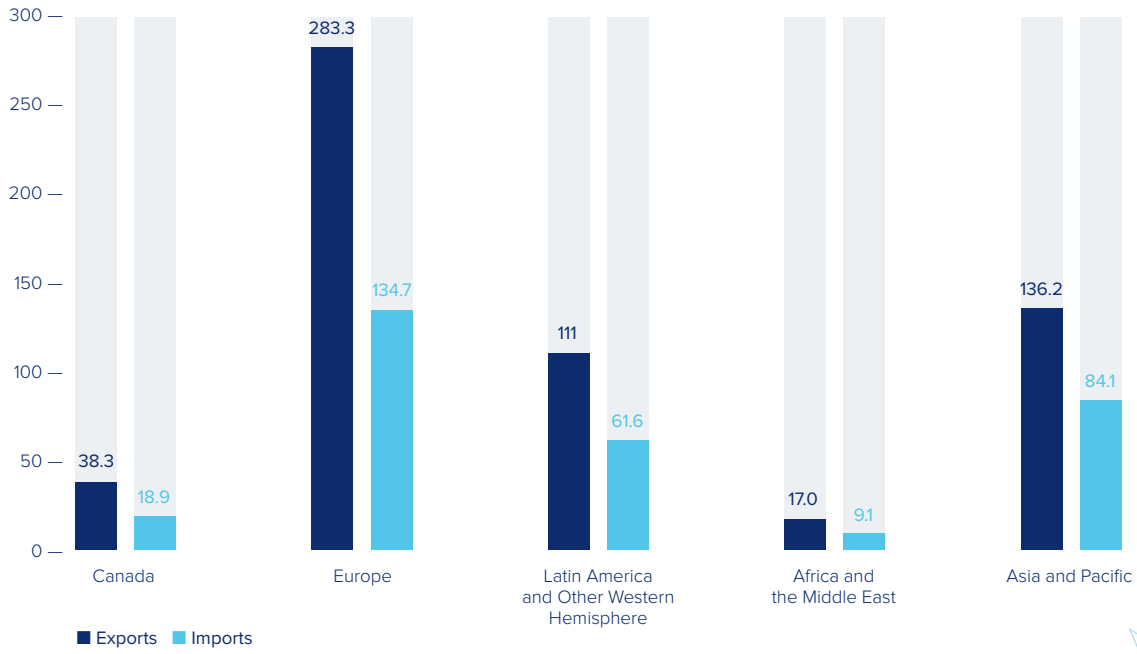
Europe and the U.S. remain each other's main commercial trading partners in digitally-deliverable services.

In 2020, the 27 EU member states collectively exported €1.0 trillion and imported €1.0 trillion in digitally-enabled services to countries both inside and outside the EU (See Tables 9 and 10). Excluding intra-EU trade, EU member states exported €551 billion and imported €594.5 billion in digitally-enabled services, resulting in a deficit of €43.3 billion for these services.

Digitally-enabled services represented 61% of all EU27 services exports to non-EU27 countries and 68% of all EU services imports from non-EU countries.

In 2020, the United States accounted for 22% of the EU27's digitally-enabled services exports to non-EU27 countries, and 34% of EU27 digitally-enabled services imports from non-

Table 8. **U.S. Trade in Digitally-Deliverable Services by Major Area, 2021*** ($Billions)



**Data for 2021 or latest available.*
Source: Bureau of Economic Analysis, Trade in Potentially ICT-Enabled Services Database.
Data as of February 2023.

Table 9. Destination of EU Exports of Digitally-Enabled Services, 2020 (€Billions)

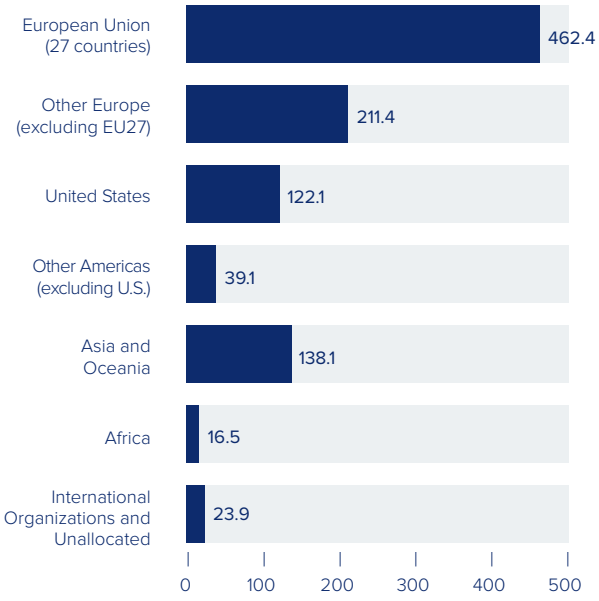
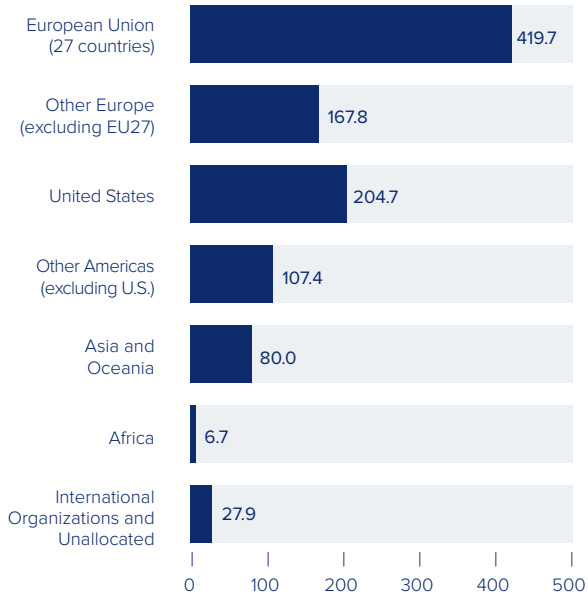


Table 10. Origin of EU Imports of Digitally Enabled Services, 2020 (€Billions)



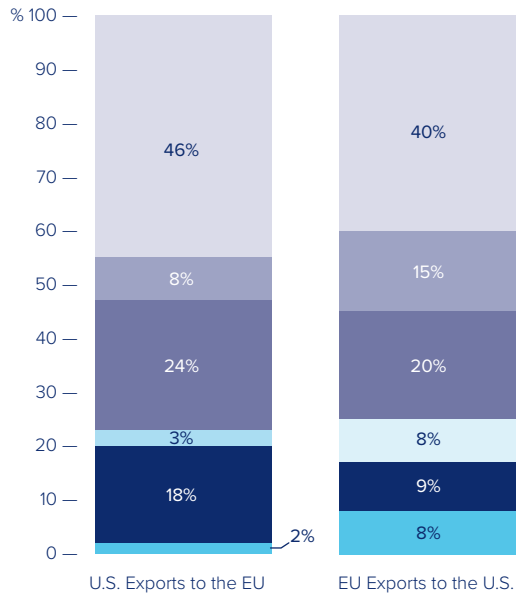
Note: Digitally-Enabled Services includes finance; insurance; IP charges; telecommunications, computer, information services; R&D services; professional and managemet services; architectural, engineering, scientific and other techhnical services; trade-related services; audiovisual services; and other personal, cultural, and recreational services. Asia includes Middle East countries.
Source: Eurostat. Data as of January 2022.

EU27 countries.[48] The United States purchased €122.1 billion, according to Eurostat data for 2020, making it the largest country for imports of EU27 digitally-enabled services exports – ahead of even the United Kingdom (€121.1 billion). The entire region of Asia and Oceania imported just slightly more than the U.S. (€138.1 billion).

In 2020, EU member states imported just over €1.0 trillion in digitally-enabled services, according to Eurostat data. 41% originated from other EU member states (See Table 10). Another 20% (€204.7 billion) came from the United States, making it the largest supplier of these services. The EU imports of these services from the U.S. were almost double imports from the UK (€114.2 billion).

Table 11 categorizes U.S.-EU digitally-enabled services trade into six sectors. For both economies, the most important exports are represented by digitally-deliverable business, professional and technical services, which accounted for 40% of digitally-enabled services exports from the EU to the United States and 46% of digitally-enabled services exports from the United States to the EU in 2021. The second most important category consists of intellectual property. This usually comes in the form of royalties and license fees, most of which are paid on industrial processes

Table 11. U.S.-EU Digitally Enabled Services Trade by Sector, 2021



Sources: U.S. Bureau of Economic Analysis. Data as of July 2022.

and software, underscoring how integral such transatlantic inputs are to production processes in each economy. Financial services comprise the third largest digitally-enabled services export category.

Digitally-Enabled Services Supplied Through Foreign Affiliates

The digital economy has transformed the way trade in both goods and services is conducted across the Atlantic and around the world. Even more important, however, is the delivery of digital services by U.S. and European foreign affiliates – another indicator reinforcing the importance of foreign direct investment, rather than trade, as the major driver of transatlantic commerce.

In 2020, U.S. services supplied by affiliates abroad were $1.65 trillion, roughly 2.3 times U.S. global services exports of $726.43 billion. Moreover, half of all services supplied by U.S. affiliates abroad are digitally-enabled.[49]

Table 12 underscores the relative importance of digitally-enabled services supplied by affiliates of U.S. companies located in Europe and affiliates of European companies in the United States, versus U.S. and European exports of digitally-enabled services. 58% of the $998 billion in services provided in Europe by U.S. affiliates in 2019 was digitally-enabled. In 2019, U.S. affiliates in Europe supplied $585.5 billion in digitally-enabled services, whereas European affiliates in the United States supplied $287 billion in digitally-enabled services. Digitally-enabled services supplied by U.S. affiliates in Europe were more than double U.S. digitally-enabled exports to Europe, and digitally-enabled services supplied by European affiliates in the United States were double European digitally-enabled exports to the United States.

The significant presence of leading U.S. service and technology leaders in Europe underscores Europe's position as the major market for U.S. digital goods and services. Table 13 underscores this dynamic. In 2020, Europe accounted for 72% of the $333 billion in total global information services supplied abroad by U.S. multinational corporations through their majority-owned foreign affiliates. This is not surprising given the massive in-country presence of U.S. firms throughout Europe, with outward U.S. FDI stock in information overwhelmingly positioned in Europe. U.S. overseas direct investment in the "information" industry in the UK alone, for instance, was almost

Digitally-enabled services supplied by affiliates (2019)

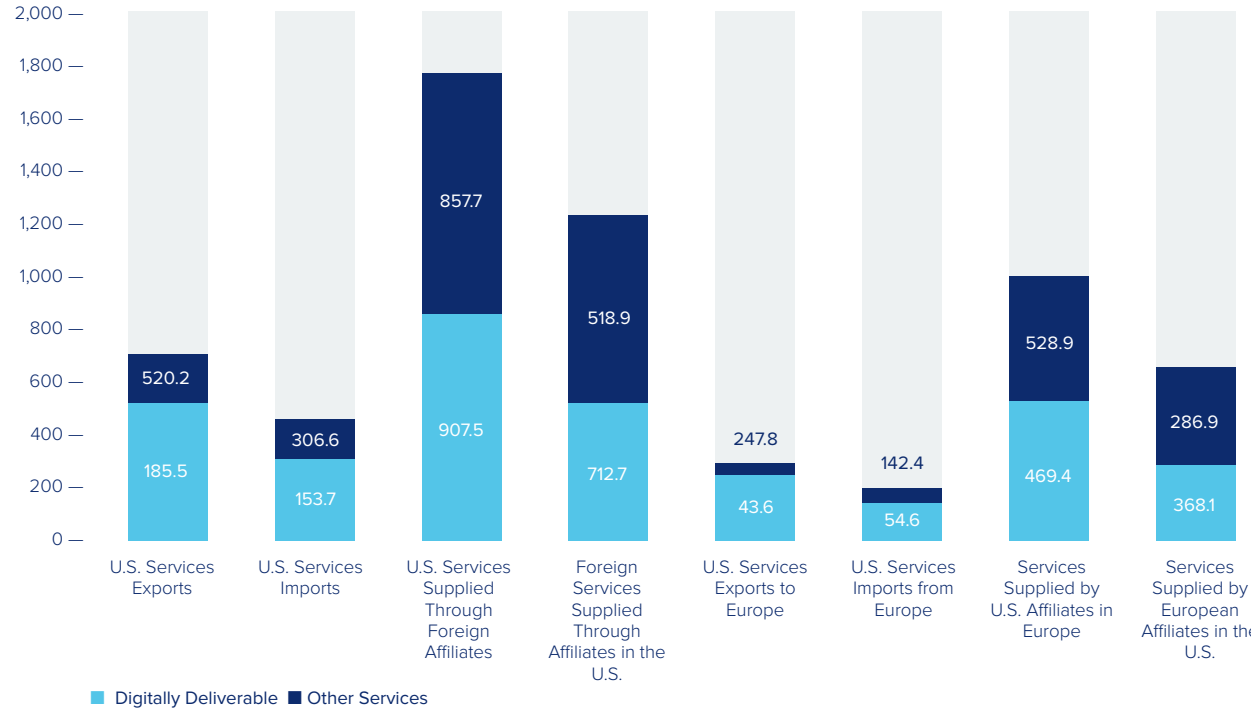
$585.5 billion

U.S. in Europe

$287 billion

Europe in the U.S.

Table 12. **Digitally-Enabled Services Trade and Services Supplied through Affiliates*** ($Billions)



**Trade data are for 2020. Affiliate data are for 2019, the latest available year.*
Source: U.S. Bureau of Economic Analysis.
Data as of October 2021.

Table 13. Information Services Supplied Abroad by U.S. Multinational Corporations through their MOFAs ($Millions)

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Canada	3,595	4,140	3,971	5,996	6,316	7,135	7,595	7,401	8,487	8,342	9,161	8,991	9,403	9,875	10,301
Europe	67,270	76,156	85,450	84,117	96,310	110,525	119,123	120,796	157,811	162,409	175,105	174,396	200,600	224,475	238,610
France	4,045	3,794	4,475	4,713	4,582	5,013	4,768	5,258	6,085	5,894	5,927	6,265	7,036	7,904	8,519
Germany	5,260	6,031	6,104	6,456	7,143	7,798	7,970	10,599	12,018	11,191	11,394	12,589	13,624	14,379	14,546
Netherlands	5,925	8,152	9,980	8,674	8,719	9,313	10,196	9,117	12,686	13,590	13,938	16,617	20,252	19,137	21,585
Switzerland	2,871	2,527	3,197	3,747	4,034	4,419	5,243	4,778	(D)	5,452	5,435	5,404	5,733	8,155	7,342
United Kingdom	33,512	35,711	31,479	29,906	24,941	26,446	25,996	23,876	30,228	33,512	35,854	37,684	38,426	54,173	55,598
Latin America and Other Western Hemisphere	7,255	10,845	13,165	13,798	17,578	20,943	21,887	21,751	22,457	20,672	20,320	21,698	23,822	23,575	19,657
Australia	5,722	6,365	6,369	5,961	6,852	6,960	5,531	7,735	7,045	6,266	6,431	7,018	8,349	12,267	13,214
Japan	3,447	(D)	6,224	7,856	4,575	4,828	5,204	5,807	7,796	7,821	11,252	9,856	11,416	12,862	14,273
China	n/a	n/a	n/a	1,252	1,633	1,627	1,581	1,656	3,016	2,675	2,726	3,250	3,620	4,475	4,070
Other Asia-Pacific, Middle East and African Countries	5,217	(D)	(D)	7,623	8,582	10,320	11,663	14,226	33,461	36,891	36,293	30,498	32,363	31,441	32,841
TOTAL	92,507	(D)	(D)	126,603	141,846	162,338	172,583	179,372	240,073	245,076	261,288	255,707	289,573	318,970	332,966

MOFA: Majority-owned foreign affiliate.
(D) indicates that the data in the cell have been suppressed to avoid disclosure of data of individual companies.
Source: Bureau of Economic Analysis.
Data as of February 2023.

double U.S. information industry investment in the entire Western Hemisphere outside the United States, and almost 14 times such investment in China. Equivalent U.S. investment in Germany was 3.6 times more than in China.

Jobs in the App Economy

Digitally-enabled services have catalyzed the growth of the App Economy on both sides of the Atlantic. During the pandemic the App Economy was critical as individuals and companies suddenly had to turn to the digital world for work, school, shopping and communications. App developers responded to these unexpected needs by launching over 2 million new apps in 2021 alone.[50] Even as the pandemic subsides, the App Economy remains vibrant.

The Progressive Policy Institute (PPI) estimates that as of January 2022 Europe had generated 3.034 million App Economy jobs, a 28% rise over three years.[51] App Economy employment in the United States totaled 2.378 million, up 14% since April 2019.[52] Those are important figures, but not overwhelming in terms of overall employment on either side of the Atlantic. Yet PPI points to the App Economy's outsized contribution to job growth since Apple opened the first App Store in July 2008. For example, from July 2008 to early 2022 the U.S. nonfarm economy added roughly 13 million jobs, while the App Economy generated 2.564 million jobs – about 20% of nonfarm job growth since its inception.[53] And as other parts of the economy have stumbled, the App Economy keeps on going. According to Statista, total revenue in the App market reached $430.90 billion in 2022, and is slated to grow to $614.40 billion by 2026.[54]

Table 14 shows App Economy jobs in Europe and the United States. Roughly half of Europe's App Economy jobs are in just three countries – the UK, Germany, and France – although the smaller Nordic countries and Switzerland are relatively "app intensive," in terms of App Economy jobs as a percentage of all jobs in the country. App Economy jobs in the United States are less concentrated, despite anecdotes about the overwhelming importance of Silicon Valley. California still leads other U.S. states in terms of App Economy jobs,

Table 14. App Economy Jobs: Top 30 European Countries and U.S. States

	Job (Thousands)	Share of European App Economy Jobs		Jobs (Thousands)	Share of U.S. App Economy Jobs
Country			State		
United Kingdom	558	18.4	California	408	15.9
Germany	504	16.6	Texas	239	9.3
France	484	16.0	Washington	137	5.3
Netherlands	267	8.8	New York	136	5.3
Spain	159	5.2	Florida	129	5.0
Sweden	134	4.4	Pennsylvania	114	4.4
Italy	127	4.1	Illinois	90	3.5
Poland	121	4.0	Virginia	83	3.2
Finland	71	2.3	Georgia	81	3.2
Switzerland	68	2.2	Massachusetts	81	3.2
Portugal	57	1.9	Colorado	75	2.9
Denmark	54	1.8	Ohio	74	2.9
Norway	53	1.7	North Carolina	74	2.9
Czech Republic	52	1.7	New Jersey	69	2.7
Belgium	43	1.4	Minnesota	62	2.4
Romania	35	1.2	Michigan	52	2.0
Austria	33	1.1	Maryland	52	2.0
Hungary	31	1.0	Oregon	44	1.7
Ireland	31	1.0	Missouri	44	1.7
Greece	19	0.1	Tennessee	43	1.7
Luxembourg	5	0.0	Arizona	40	1.6
Remaining 9*	128	4.2	Indiana	35	1.4
			Wisconsin	35	1.4
			Utah	28	1.1
			Remaining 21**	339	13.2
Total 30 countries	**3,034**		**Total 50 states**	**2,564**	

*As of December 2021. *Includes estimates for Bulgaria, Croatia, Cyprus, Estonia, Latvia, Lithuania, Malta, Slovakia, and Slovenia. **20 states plus the District of Columbia. Sources: Michael Mandel, "Europe App Economy Update 2021," Progressive Policy Institute, May 25, 2022, https://www.progressivepolicy.org/blogs/europe-app-economy-update-2021/; Michael Mandel and Jordan Shapiro, "US App Economy Update 2021," Progressive Policy Institute, May 25, 2022, https://www.progressivepolicy.org/wp-content/uploads/2022/05/PPI_US-App-Economy-Update-2022_V4.pdf. Data: ILO, Eurostat, Indeed, PPI.*

but its lead is diminishing. The Golden State, which accounts for 12% of the U.S. population, accounted for 15.9% of U.S. App Economy jobs in 2022, down from 29% in 2012. New York, Illinois, and Massachusetts have also lost share, whereas states such as Texas, Washington, Florida and Pennsylvania have all gained. Some smaller U.S. states like Colorado, Minnesota, Maryland and Oregon are also relatively "app intensive".

2. E-Commerce

Electronic commerce (e-commerce), which usually refers to transactions in which goods or services are ordered over a computer network (e.g., over the Internet), offers a second window into transatlantic digital connections.[55] Here again we run into some definitional and data challenges. Most estimates of e-commerce do not distinguish whether such commerce is domestic or international. Many metrics do not make it clear whether they cover all modes of e-commerce or only the leading indicators of business-to-business (B2B) and business-to-consumer (B2C) e-commerce. Finally, there are no official data on the value of cross-border e-commerce sales broken down by mode; official statistics on e-commerce are sparse and usually based on surveys rather than on real data.[56]

Nevertheless, we can evaluate and compare many different estimates and surveys that have been conducted. According to UNCTAD, global e-commerce was worth $26.7 trillion globally in 2020 – equivalent to 30% of global gross domestic product.[57]

When most people hear the term 'e-commerce,' they think of consumers buying things from businesses via websites, social networks, crowdsourcing platforms, or mobile apps. These business-to-consumer transactions (B2C), however, pale in comparison to business-to-business (B2B) e-commerce. In 2022 B2B e-commerce was estimated to exceed $22 trillion and account for the vast majority of global e-commerce.[58] By 2028 the global B2B e-commerce market is slated to reach a value of $25.65 trillion, over three times more than the B2C market, which is expected to total $7.65 trillion.[59] B2B e-commerce sales were estimated to total $1.67 trillion in the United States and $1.33 trillion in Europe in 2022, and are projected to reach $2.25 trillion and $1.8 trillion, respectively, in 2025.[60]

While B2B e-commerce accounts for the bulk of global e-commerce, most B2B e-commerce does not cross a border. Most B2B e-commerce users are manufacturers or wholesalers who are dependent on physically moving goods, and often heavy freight; the lack of freight digitalization ultimately poses a barrier to cross-border B2B e-commerce. The sheer volume of B2B e-commerce, however, means it still is the most important component of cross-border e-commerce sales.[61]

Including all types of e-commerce, the United States was the top market in the world in the pre-pandemic year of 2019, for which there is the latest comparable data. U.S. online sales

Table 15. Top 10 Countries by E-Commerce Sales

Rank	Economy	Total ($Billion)	As % of GDP	B2B ($Billion)	% of all e-commerce	B2C ($Billion)
1	United States	9,580	45	8,319	87	1,261
2	Japan	3,416	67	3,238	95	178
3	China	2,604	18	1,065	41	1,539
4	Korea (Rep.)	1,302	79	1,187	91	115
5	United Kingdom	885	31	633	72	251
6	France	785	29	669	85	116
7	Germany	524	14	413	79	111
8	Italy	431	22	396	92	35
9	Australia	347	25	325	94	21
10	Spain	344	25	280	81	64
	Top 10 Total	*20,218*	*36*	*16,526*	*82*	*3,691*
	World	**26,673**	**30**	**21,803**		**4,870**

Source: UNCTAD. Data for 2019, latest available. B2B: Business-to-Business. B2C: Business-to-Consumer.

Table 16. Cross-Border B2C Sales of Top Ten Merchandise Exporters

Rank	Economy	Total ($Billion)	As % of merchandise exports	% of B2C e-commerce sales
1	China	105	4.2	6.8
2	United States	90	5.5	7.1
3	United Kingdom	38	8.2	15.2
4	Hong Kong	35	6.2	94.3
5	Japan	23	3.3	13.2
6	Germany	16	1.1	14.7
7	France	12	2.2	10.6
8	Italy	5	0.9	13.9
9	Korea (Rep.)	5	0.9	4.4
10	Netherlands	1	0.2	4.3
	Top 10 Total	*332*	*3.4*	*9.0*
	World	**440**	**2.3**	**9.0**

Source: UNCTAD. Data for 2019, latest available B2C: Business-to-Consumer.

there were 2.8 times higher than in Japan and 3.7 times higher than in China. North America and Europe accounted for six of the top 10 e-commerce countries (Table 15). China's large B2C e-commerce market reflects its billion-plus population. China is underweight, however, when it comes to B2B e-commerce.

When it comes to cross-border B2C e-commerce sales, China and the United States led in terms of total value, while the UK led in terms of B2C e-commerce as a share of overall goods exports (Table 16).[62]

Cross-border e-commerce revenues (excluding travel) in Europe reached €171 billion in 2021, an increase of 17% compared to 2020. Among 16 prominent European ecommerce markets, 25.5% of total B2C turnover was cross-border in 2020, for which there is the latest comparable data. Cross-border turnover accounted for 35% or more of total ecommerce turnover for Austria, Denmark, Finland, Ireland, Luxembourg, Norway, Portugal and Switzerland.[63]

One likely effect of Brexit, with its accompanying cross-border complications related to new tax provisions, import duties, and logistics adjustments, was that UK cross-border B2C e-commerce sales dropped by 12% in 2021, falling to €29 billion from €33 billion in 2020. The UK lost its traditional position to Germany as Europe's top cross-border B2C e-commerce country. Whereas UK retailers accounted for one of every five of the top 500 European cross-border e-commerce companies in 2020, they accounted for only one in 68 in 2021 – a decline of 32%.[64]

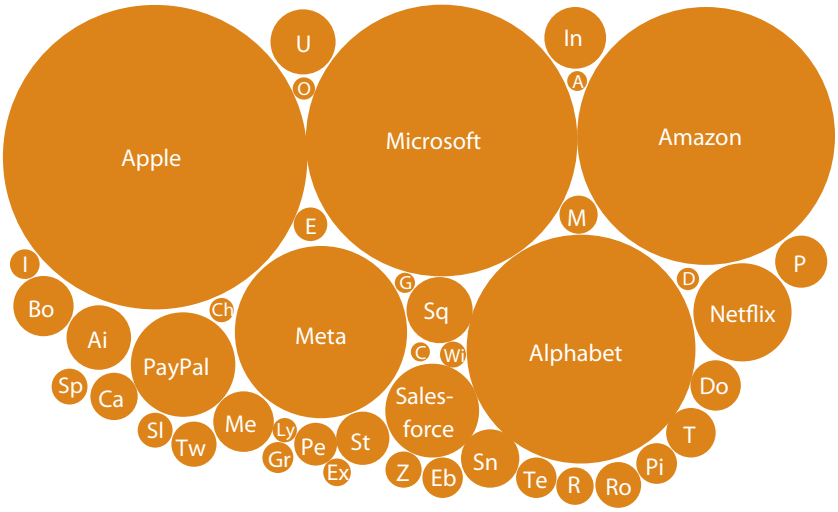
3. The Platform Economy

Platform companies that connect individuals and companies directly to each other to trade products and services continue to reshape the U.S. and European economies, as well as the commercial connections between them. Platforms have swiftly become a prominent business model in the transatlantic and global economy, both by matching supply and demand in real time and at unprecedented scale, and by connecting code and content producers to develop applications and software such as operating systems or technology standards.[65] Platform models have risen so quickly over the past two decades that by 2019, platform companies accounted for 7 of the 10 most valuable global firms.[66] By 2025, platform models are projected to expand to around $60 trillion, or nearly one-third of all global commerce.[67]

Size matters in the platform economy. The biggest are U.S. companies, which account for about two-thirds of the global platform economy. Next come Chinese companies. European platform companies on average are markedly smaller than their U.S. and Chinese counterparts, and together represent only 3% of global market value (Table 17).

Table 17. **Geographical Distribution of the Top Global Platforms.** Based on MarketCap/last-known venture round valuation. (December 2021)

America

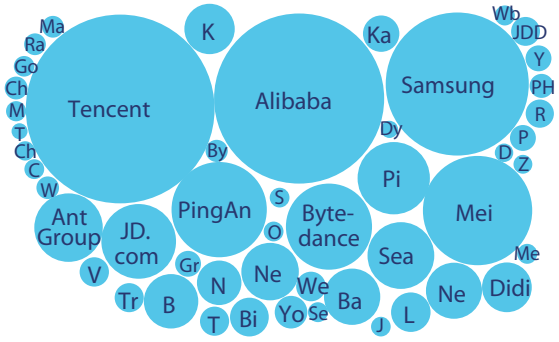


Airbnb
Alteryx
Booking
Carvana
Chegg
Doordash
Dropbox
Ebay
Etsy
Expedia
Grainger
Grubhub
Instacart
Intuit
Lyft
Match
MercadoLibre
Opendoor
Palantir
Peloton
Pinterest
Roblox
Roku
Slack
Snap
Splunk
Square
Stripe
Teladoc
Twilio
Twitter
Uber
Wish
Zillow

Europe

Adyen
Auto1
Checkout
Delivery Hero
Edenred
Hellofresh
Farfetch
Klarna
Spotify
Just Eat T.
Yandex

Asia-Pacific



Baidu
Beike
Bilibili
BYJU
Chehaoduo
Coupang
Dada Nexus
Didi Chuxing
Go-Jek
Grab
JD Digits
Kakao
Kuaishou
Lufax
Manbang
Meicai
Meituan
Mercari
Naver
Netease
Ola
OYO
Paytm
Pinduoduo
PindAn **H**ealth
Rakuten
Rea
Sea Group
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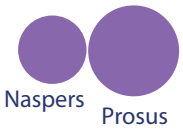
Tokopedia
Trip.com
VipShop
WeBank
WeDoctor
Weibo
YonYou
Yuanfudao

Africa



Share in total value, by region (%)

Number of top 100 platforms, by region

Source: Holger Schmidt, available at www.netzoekonom.de/vortraege/#tab-id-1 (data as of May 2021).

The dramatic rise of U.S. and Chinese platform companies has generated considerable concern among Europeans that they may be missing out on a major economic transformation. Europe certainly faces some challenges. However, size is not everything. Platform economics have rewarded entrepreneurship and the adoption of new business models. Those who can develop both their digital and their entrepreneurial ecosystems stand to profit greatly from the platform revolution. The Digital Platform Economy Index, which draws on 112 indicators that integrate digital and entrepreneurial ecosystems gauges, goes beyond size to offer a more differentiated view of digital platform-based ecosystem performance (Table 18).

According to this Index, North American and European countries account for 9 of the top 10, and 17 of the top 20, countries when it comes to combined digital and entrepreneurial ecosystem development. China's brand of state-driven capitalism ranks highly in terms of building digital ecosystems, but lags behind the leaders when it comes to digital entrepreneurship.[68] The leading countries not only host digital multi-sided platforms, they rank highly in terms of digital technology entrepreneurship, digital infrastructure governance, and "digital user citizenship".

In the end, it is Europe's larger ecosystem that is likely to shape its future in the platform economy. This underscores the importance of a true European Single Market, including a more integrated Digital Single Market, that would transcend fragmentation of languages, consumer preferences, rules and regulations to facilitate cross-border research, development and commercialization that could introduce new technologies and fresh business models to reach the kind of scale that platform companies have achieved in the large continental markets of the United States or China.[69]

Table 18. Top 20 Countries in the Digital Platform Economy Index

Rankings				
Overall	Multi-Sided Platforms	Digital Technology Entrepreneurship	Digital Infrastructure Governance	Digital User Citizenship
1. United States	1	1	2	6
2. United Kingdom	3	3	4	1
3. Netherlands	2	4	1	4
4. Canada	5	5	6	2
5. Sweden	4	6	5	5
6. Switzerland	9	2	8	7
7. Norway	6	12	3	3
8. Denmark	7	11	9	10
9. Australia	10	18	7	8
10. Finland	11	8	11	9
11. Ireland	14	7	17	15
12. Luxembourg	17	14	10	14
13. New Zealand	8	23	14	11
14. Germany	23	13	12	12
15. France	16	9	15	18
16. Iceland	13	10	16	22
17. Belgium	15	17	18	17
18. Estonia	22	21	19	16
19. Hong Kong	20	19	13	26
20. Austria	28	20	21	19

Source: Zoltan J. Acs, László Szerb, Abraham K. Song, Éva Komlósi, Esteban Lafuente, The Digital Platform Economy Index 2020, Global Entrepreneurship and Development Institute, December 2020, https://thegedi.org/wp-content/uploads/2020/12/DPE-2020-Report-Final.pdf.

Transatlantic data flows account for more than half of Europe's data flows and about half of U.S. data flows globally.

EU-based firms transferring data to and from the U.S. (2020)

Over 90%

4. Cross-Border Data Flows

Another lens through which we can better understand transatlantic digital connections is to appreciate the role of cross-border data flows, which not only contribute more to global growth than trade in goods, they underpin and enable virtually every other kind of cross-border flow.[70]

Transatlantic data flows are critical to enabling the $7.1 trillion EU-U.S. economic relationship. They account for more than half of Europe's data flows and about half of U.S. data flows globally. Over 90% of EU-based firms transfer data to and from the United States.[71]

However, despite the broad recognition of its value, and the need to develop appropriate policy frameworks, there is still no consensus method for empirically determining the value of data.[72] One reason is that data is a special resource different than goods and services. UNCTAD calls cross-border data flows "a new kind of international economic flow, which lead to a new form of global interdependence".[73] Data flows are not necessarily a proxy for commercial links, since data traffic is not always related to commercial transactions.[74] Knowing the volume of data flows does not necessarily provide insight on the economic value of their content. The BEA puts it succinctly: "Streaming a video might be of relatively little monetary value but use several gigabytes of data, while a financial transaction could be worth millions of dollars but use little data".[75]

In addition, commercial transactions do not always accompany data, and data do not always accompany commercial transactions. For instance, multinational companies often send valuable, but non-monetized, data to their affiliates.[76] User-generated content on blogs and on YouTube drives very high volumes of internet traffic both within countries and across borders, but consumers pay for very little of this content. Since it does not involve a monetary transaction, the significant value that this content generates does not show up in economic or trade statistics.[77] In short, data flows are commercially significant, yet their extent, as well as their commercial value, are hard to measure and are in constant flux.

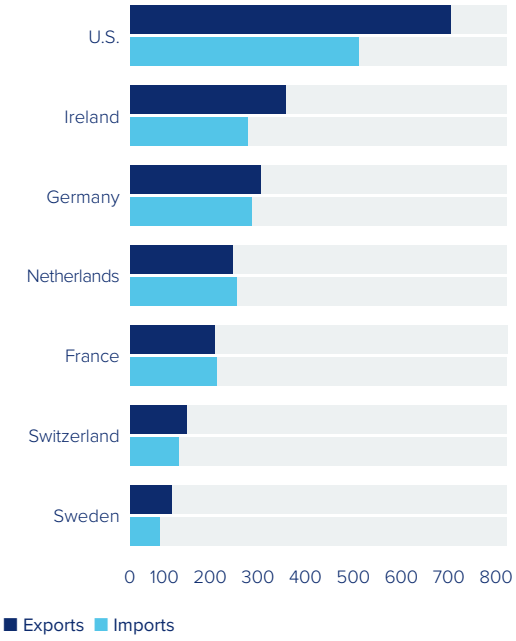
Box 1. Forging a Transatlantic Data Privacy Framework

Data flows are critical to the transatlantic economy, yet U.S.-EU regulatory differences have generated legal uncertainties regarding the transfer of personal data. In July 2020, the Court of Justice of the European Union (CJEU) invalidated the Privacy Shield framework that enabled over 5,000 mostly small- and medium-sized enterprises to transfer personal data for commercial purposes. This prompted renewed negotiations that led to the EU-U.S. Data Privacy Framework (DPF) announced by Presidents Biden and von der Leyen in March 2022. Six months later, President Biden issued an Executive Order that strengthened principles-based privacy and civil liberties safeguards for U.S. intelligence activities, and created an independent and binding mechanism that individuals can use to challenge violations of these principles. In December, the European Commission issued a draft decision that these protections are "essentially equivalent" to those provided within the EU when the personal data of Europeans is transferred to the United States. However, such determinations are based on self-compliance certification schemes similar to those invalidated by the CJEU. As a result, the DPF, like its predecessors, is likely to face legal challenges from within the EU.[78]

Cross-Region Data Flows

Globally, the most intense and valuable cross-region data flows continue to run between North America and Europe. They are also almost certainly the most valuable, even if their worth is difficult to measure. The OECD devised metrics to determine the most active countries when it comes to delivering products across borders through data flows, as opposed to considering all transactions facilitated through data flows. It determined that the United States is a major hub for international trade in products delivered through data flows, and that France, Germany, India, Ireland, the Netherlands, Switzerland, and the United Kingdom also feature heavily in trade underpinned by data, all ahead of China (Table 19).[79]

Table 19. **International Trade Underpinned by Data Flows, Top Countries** (€Billions)



Note: Trade underpinned by data flows includes four categories: (1) "ISIC J production", or trade in products produced by firms classified in ISIC section J (Information and Communication); (2) "ISIC J products," or trade in the products mainly associated with firms classified in ISIC section J but including production by firms classified in other sectors; (3) "Digitally deliverable services," or "potentially ICT-enabled products" per UNCTAD (2015); and (4) "Digitisable products," or products within the WTO HS commodity classification per Banga (2019).
Source: OECD, Perpectives on the Value of Data and Data Flows, December 2020.
Data as of October 2020.

5. Digital Wiring: Land-Based Hubs and Sea-Based Spokes

The Digital Landscape: Hubs and Hyperscalers

The United States and Europe host key land-based hubs and sea-based spokes of the global digital economy. European and U.S. cities are major hubs of cross-border digital connectivity. Europe is the global leader, with tremendous connected international capacity. Frankfurt, London, Amsterdam and Paris – together known as FLAP – substantially outpace North American and Asian cities (Table 20). Frankfurt is home to the largest Internet node in the northern hemisphere. Frankfurt's connected capacity is over three times greater than that of New York and double that of Singapore, the Asian leader.[80] Investments in European data centers are now expanding beyond FLAP to encompass sites like Dublin, Ireland – home to many digital companies – and Marseille, France, which has become a major hub for traffic between Europe, Africa and the Middle East.

Table 20. **10 Highest Capacity International Internet Hub Cities** (€Billions)

Domestic routes omitted. Source: Telegeography, The State of the Network 2022.

The hard-wiring of the transatlantic digital landscape continues to evolve. One key development is the shift in providers of data centers and cloud-like services from European and U.S. telecommunication companies and related data-center management enterprises to "hyperscalers," mainly from the United States. Traditional data centers are centralized facilities that use computing and networking systems and equipment to store data and to enable users to access those resources. Now, the opportunity to use applications that work together via the web and the cloud has given birth to more cost-effective hyperscale data centers that can store more data and scale up or down in quick response to shifting demand for computing tasks.

Many commentators simplify the term "hyperscalers" to refer to the three largest providers: Amazon Web Services (AWS), Microsoft Azure, and Google Cloud. These three firms account for about two-thirds of hyperscale data market share. Nonetheless, other hyperscalers include Meta, Oracle, Apple, IBM, Scaleway, Switch, Alibaba, Huawei, QTS, Digital Realty Trust, Equinix and SAP. [81]

Hyperscale data centers accounted for more than half of all installed data-center servers and total data center traffic in 2021. The global hyperscale data center market is slated to grow by $107.60 billion between 2021-2025. There are now more than 700 hyperscale data centers around the world, double the amount of five years ago. That number is expected to top 1,000 at the end of 2024 and reach 1,200 by the end of 2026.[82]

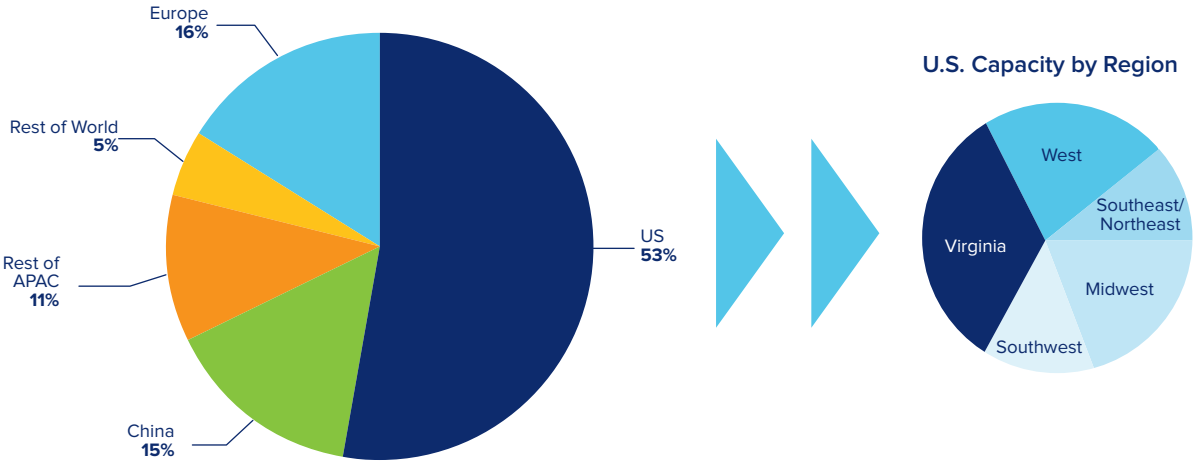
The United States currently accounts for over 53% of the world's operational hyperscale infrastructure, measured by critical IT load.[83] More than one-third of U.S. hyperscale capacity is located in one state – Virginia.[84] Virginia has far more hyperscale data center capacity than either China or all of Europe. Much of that is in Northern Virginia, along the border with Washington, DC. The second-largest concentration of hyperscale infrastructure is in the western United States, primarily Oregon and California. The U.S. Midwest follows, with large concentrations of hyperscale infrastructure in Iowa and Ohio.[85]

The other half of global hyperscale infrastructure is relatively evenly split between China, Europe, and the rest of the world.

In Europe, the leading country markets for hyperscale infrastructure are Ireland and the Netherlands, followed by Germany and the UK. The Western Europe and Nordic hyperscale data center market is expected to be generating revenues of around $29 billion in 2023.[86]

While many U.S. and European regions have embraced this torrid pace of investment, others have raised concerns about data centers' size and heavy energy and water use. By 2030, data centers are projected to account for 3.2% of electricity demand within the EU – an 18.5% jump from 2018, at a time when Europe is under severe pressure to cut its energy demand. The Netherlands issued a nine-month moratorium on new hyperscale sites in February 2022. Authorities in Ireland and in cities such as

Table 21. Hyperscale Data Center Capacity (Q2 2022)



Source: Synergy Research Group. APAC: Asia-Pacific.

Frankfurt and Paris are grappling with related proposals. Similar worries have surfaced across the ocean in Virginia.[87]

These concerns are amplified by related European anxieties about U.S. dominance, which could inhibit some possible avenues for deeper transatlantic cooperation. The European cloud market, for example, is now over five times as big as it was in early 2017, reaching $10.9 billion in the second quarter of 2022. During that time, European providers have grown their cloud revenues by 167%. Their market share in Europe, however, has declined from 27% to under 13%, whereas AWS, Microsoft Azure and Google Cloud now account for 72%.[88] Among the European cloud providers, SAP and Deutsche Telekom are the leaders, each accounting for 2% of the European market.[89]

Two other trends have the potential to mitigate such concerns, depending on how they unfold: migration to the "edge;" and the evolution of "cloud-as-a-service" to "cloud-as-a-product".

Today, most cloud computing still happens in centralized rather than decentralized data centers. By 2025, this trend will reverse: 80% of all data is expected to be processed in smart devices closer to the user, known as edge computing. A few enormous data centers may still be built, but the more pervasive reality will be the emergence of thousands of small data centers distributed more evenly across geographies. This could open opportunities for European providers to offer multi-cloud options that ensure local control over data with the amplified possibilities that come from hyperscaled connections. Cloud/edge computing is likely to be critical to the EU's ability to realize its European Green Deal, particularly in areas such as farming, mobility, buildings and manufacturing.[90]

These opportunities are likely to be influenced by the evolution of the cloud from being a platform on which a business runs, to becoming the product itself. Rather than considering hyperscalers as direct competitors, some European telecoms operators and companies in a range of other businesses now see their biggest opportunities in the cloud building on top of the basic infrastructure already rolled out by U.S. companies. For instance, Siemens is building an ambitious "industrial cloud platform" on top of the basic cloud infrastructure provided by AWS, to enable it to become a key player in digital industrial manufacturing services. Thales, a French defense company, has formed a company in cooperation with Google Cloud to operate three "trusted cloud" hyperscale data centers in France. Other examples include Vodaphone's multi-year strategic partnership with Google, and an alliance between AWS and European digital company Atos.[91]

Submarine cables in the Atlantic already carry 55% more data than transpacific routes.

The Digital Atlantic Seascape

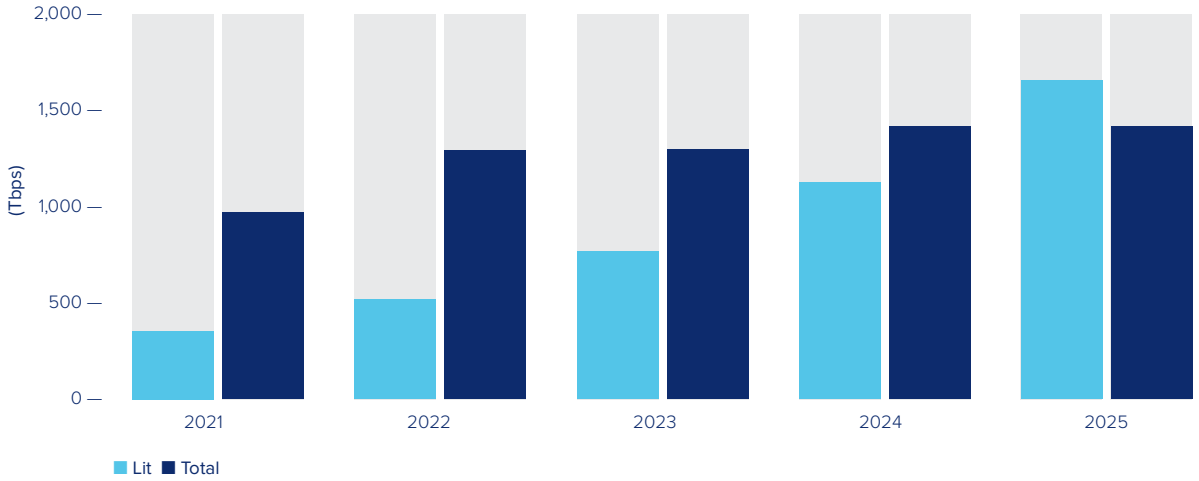
Land-based digital hubs are connected to sea-based digital spokes – roughly 500 undersea fiber optic cables that transmit 95% of all intercontinental telecommunication traffic, carry an estimated $10 trillion worth of financial transactions every day, and serve as the backbone for the global internet.[92] Elon Musk's Starlink may have popularized the idea of satellite internet, but satellites cannot compete with submarine cables when it comes to digital communication capacity, speed, or transaction time (latency). They transmit less than one-half of one percent of such traffic.[93]

Subsea cables serve as an additional proxy for the ties that bind continents. Despite uncertain economic growth prospects for many countries, demand for international bandwidth continues to be strong. Globally, the market for submarine fiber optic cables is estimated to reach $30.8 billion by 2026, growing at an annual rate of 14.3%.[94]

The transatlantic data seaway is the busiest and most competitive in the world. Submarine cables in the Atlantic already carry 55% more data than transpacific routes, and with new capacity buildout, that ratio is tilting further in favor of the Atlantic. North America and Europe are connected via 17 subsea cables. The extend from the U.S. East Coast, primarily from New York, New Jersey, Massachusetts, and Virginia. They land in the UK, France, Denmark, Norway, Ireland, Spain and Portugal.[95]

Transatlantic subsea routes are building out fast, as capacity demands grow from New York across the North Atlantic, and as new connections are built out from the U.S. Mid-Atlantic and across the South Atlantic. Relatively slow buildout of transatlantic bandwidth during Covid year 2020 was replaced by what Telegeography called "scorching" growth in 2021 and 2022. In 2021, 90 Tbps of transatlantic bandwidth was added – equivalent to building all international links from the 2013 internet, for the whole world, in a single

Table 22. Transatlantic Capacity Growth, 2021-2025



Source: Submarine Telecoms Forum.

year. And Telegeography estimates an even greater amount, a record 136 Tbps, was added in 2022.[96]

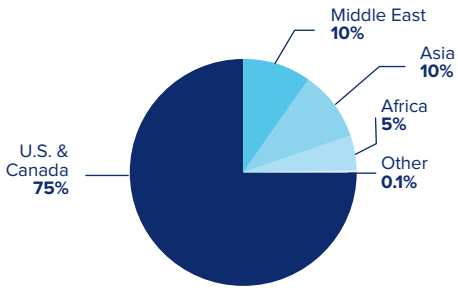
This meteoric rise in transatlantic bandwidth growth is being driven by individuals and businesses switching to cloud and web-based services. Based on current trends, demand could outpace design capacity growth by 2025 (Table 22).[97]

In 2022, total transatlantic capacity was boosted by 70% just by two new powerful transatlantic cables: Grace Hopper, which now extends 6,250 km from New York to the Cornish seaside resort town of Bude in the UK and 6,300 km from New York to Bilbao in Spain; and Amitié, which now connects Massachusetts with Bude and with Le Porge in France across 6,600 km of subsea terrain.[98]

The South Atlantic Express cable, stretching from Virginia Beach, Virginia all the way to South Africa, is slated to begin operations this year. So too is the IRIS cable, which runs 1,700 km from Ballyloughane Strand in Galway, on the Irish west coast, to Thorlakshofen beach in southwest Iceland. It is the first Irish submarine cable not linked to the UK, and the first direct cable link between Ireland and Iceland.[99] The Leif Erikson Cable System, slated for service in 2024, will run 4,200 km from southern Norway to Goose Bay, Canada, and then on Montreal. It will be the first transatlantic cable powered with 100% renewable energy.[100]

The trans-Atlantic route accounted for 75% of Europe's total interregional bandwidth in 2021. The Middle East and Asia each accounted for 10%, Africa 5%, and other regions for 1%. There are land-based networks that link Europe to Asia, but they boast far less capacity than subsea cables – and all of them go through Russia.[101]

Table 23. Share of European Interregional Bandwidth by Region



Data for 2021. Source: Telegeography.[102]

The Digital Arctic may also become reality. The Far North Fiber project, led by Alaskan company Far North Digital, Finland's Cinia, and Japan's Arteria Networks, would extend 14,000 km to connect Scandinavia and Ireland to Japan, passing via the Arctic Northwest Passage, with landings in Greenland, Canada and Alaska. The cable would be the first to be laid on the Arctic seabed and the first to connect Europe to Asia without passing via

the Suez Channel in Egypt, a critical choke point regarding internet infrastructure and international trade. The cable is expected to cut data transmission delays between Frankfurt and Tokyo by around 30%. Russia is preparing to launch its own Arctic cable, Polar Express, in 2026.[103]

Security Concerns

Subsea cables are relatively fragile. On average, 2-4 cables break somewhere in the world every week. Most incidents are caused by shipping or environmental damage. However, recent episodes have prompted suspicions about sabotage. In November 2021, a network of undersea sensors of the Norwegian Ocean Observatory was cut; two months later, the undersea cables connecting Norway's Svalbard Satellite Station to the mainland were cut. Impaired operations at that station, which connects to Europe's Galileo satellite system, could cripple the EU's ability to monitor maritime infrastructure.[104] These indicators of vulnerability, often attributed to human error, took on new meaning following Russia's invasion of Ukraine in February 2022. A trio of explosions that severed both strands of the Nord Stream I and one of the Nord Stream II pipelines in the Baltic Sea in September have heightened fears that subsea cables linking Europe to the rest of the world could be targeted.[105]

Investigators have concluded the Nord Stream incident was clearly an intentional attack, and almost certainly required nation-state capabilities to carry out. As of this writing, there is no substantive proof of attribution. Western officials have hinted that Russia was behind the sabotage, and have pointed to Russian ships and submarines monitoring Atlantic cable crossings and landings. Others point to the possibility of sabotage by pro-Ukrainian individuals without links to the Kyiv government, possibly acting on their own. [106]

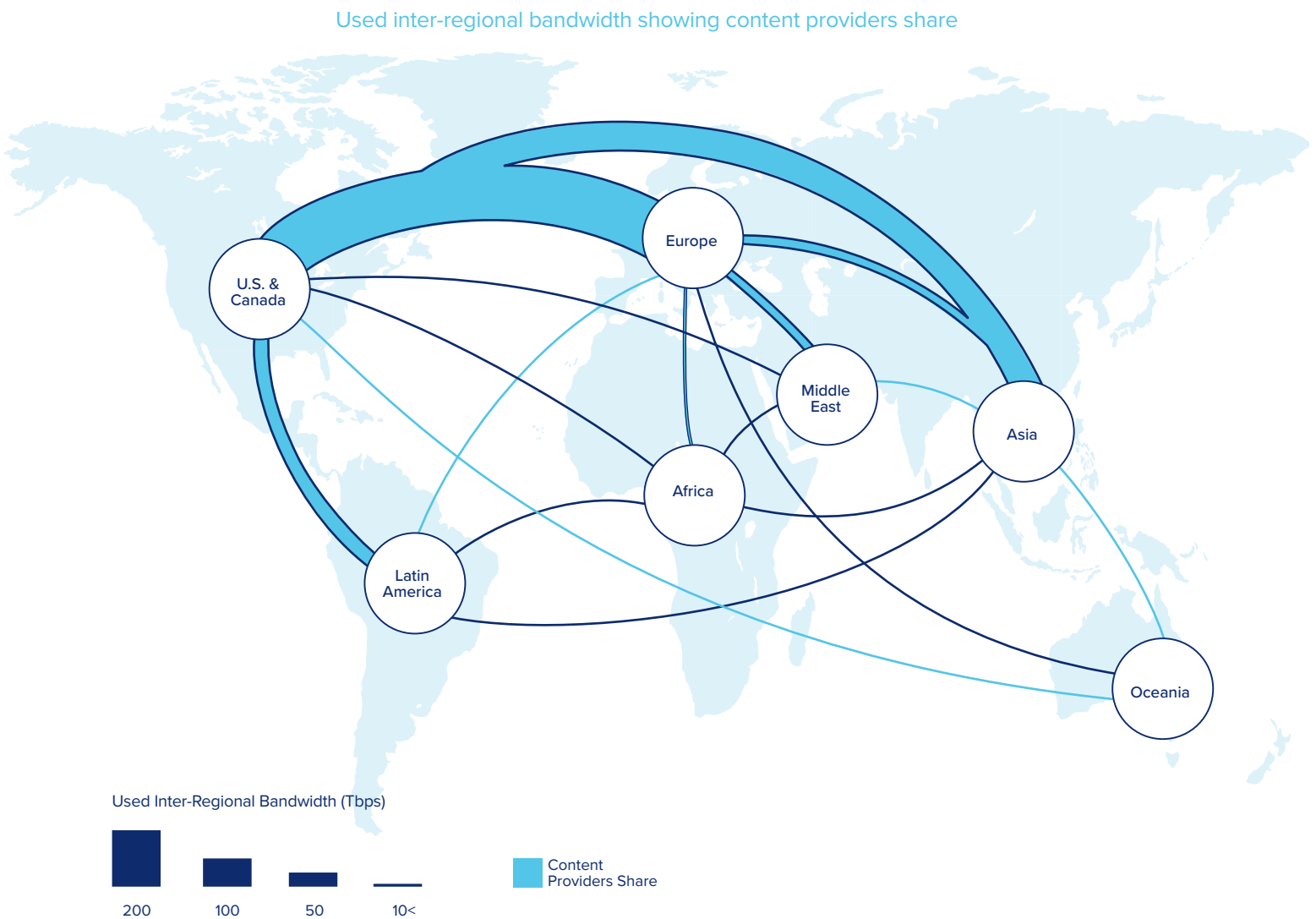
In response, NATO governments are ramping up their own surveillance and deep-sea defensive capabilities to protect maritime infrastructure. Concerns about subsea cable fragility has also prompted subsea cable providers to generate greater redundancy and diversification across their own networks.

Such concerns are not limited to potential Russian activities. The "most vital bottleneck for the EU," according to a European Parliament study, is the passage between the Mediterranean and the Indian Ocean, where sixteen subsea cables converge in Egypt and the Red Sea. The fragility of this major chokepoint was highlighted in March and again in June 2022, when the Asia-Africa-Europe-1 Internet cable connecting Hong Kong to Marseille was severed where it briefly crosses across land in Egypt. Millions were plunged offline; Ethiopia lost 90% of its connectivity; Somalia lost 85%. A number of cable providers are now working to generate cable connections that would cross Israel, bypassing Egypt and the Suez Canal.[107]

The Hyper-Providers

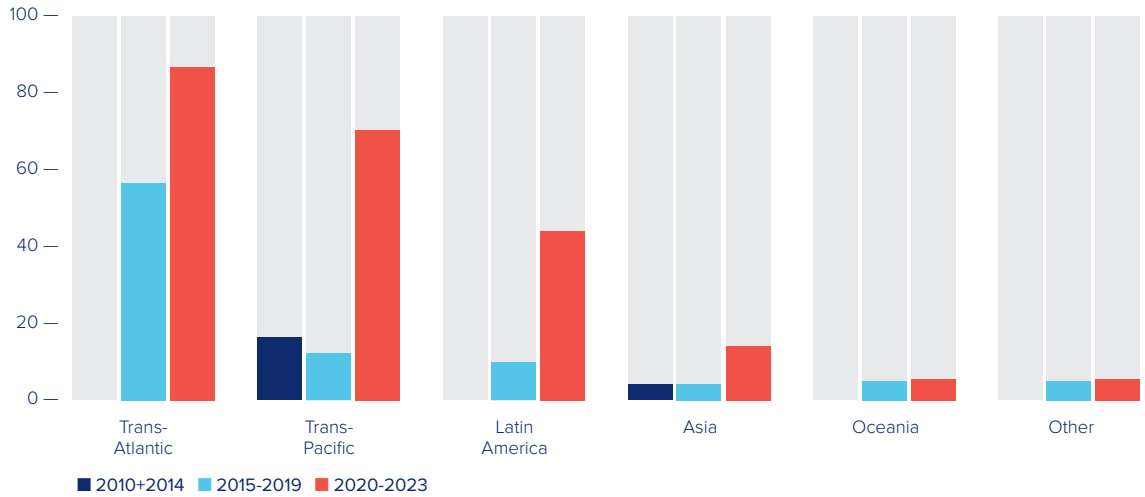
In 2010, the vast majority of international cable capacity was used by telecommunications companies, governments, and research-educational networks. Only 6.3% was consumed by private network providers of content and cloud services. By 2021, the numbers had flipped: content providers accounted for 69% of used international bandwidth globally and for 91% of used capacity on transatlantic routes. Moreover, the content providers now build and either wholly or partially own those cables themselves.[108] They are largely responsible for the new surge in global subsea digital capacity, and their densest connections are between North America and Europe (Table 24).

Table 24. Inter-Regional Capacity and the Cloud



Source: Telegeography.

Table 25. Content Provider Investments Share as % of CAPEX on New Submarine Cables



Source: Telegeography.

Bypassing the Internet

The rise of private content providers as drivers of submarine cable traffic is related to yet another significant yet little understood phenomenon shaping the transatlantic digital economy: more and more companies are working to bypass the public internet as a place to do business in favor of private channels that can facilitate the direct electronic exchange of data among companies.[109]

This move is exponentially increasing demand for "interconnection" – direct, private digital data exchanges that bypasses the public internet – and is another fundamental driver behind the proliferation of transatlantic cable systems. Private interconnection bandwidth is not only distinct from public internet traffic, it is already 9 times larger and is slated to grow much more quickly.[110]

The public internet will remain a pervasive force in most people's lives and a key to digitally-delivered services, e-commerce and the platform economy.[111] Yet private interconnection is rising alongside the public internet as a powerful vehicle for business. And as we have shown here, its deepest links are across the Atlantic.

Notes

1 Shira Ovide, "A Comeback for Digital Stores," *New York Times*, February 25, 2022.
2 Angus Loten, "Global IT Spending Decreased in 2022," *Wall Street Journal*, January 18, 2023; Richard Waters, "Post-pandemic downturn enforces Big Tech 'correction'," *Financial Times*, January 28, 2023.
3 Alex Irwin-Hunt, "Big tech layoffs barely touch pandemic hiring," Fdi Intelligence, February 15, 2023, https://www.fdiintelligence.com/content/data-trends/big-tech-layoffs-barely-touch-pandemicera-hiring-82050.
4 Soumitra Dutta and Bruno Lanvin, eds., "The Network Readiness Index 2022" (Washington, DC: Portulans Institute, 2022), https://networkreadinessindex.org; UNCTAD, *Digital Economy Report 2021*, https://unctad.org/system/files/official-document/der2021_en.pdf; "Worldwide Global DataSphere Forecast, 2021–2025: The World Keeps Creating More Data — Now, What Do We Do with It All?" IDC, 2020; Tom Coughlin, 175 Zettabytes by 2025," *Forbes*, November 27, 2018; Paul Overberg and Kevin Hand, "How to understand the data explosion," Wall Street Journal, December 8, 2021.
5 Telegeography, "The State of the Network 2022," https://www2.telegeography.com/hubfs/LP-Assets/Ebooks/state-of-the-network-2022.pdf.
6 Data.ai, "State of Mobile 2023"; Simon Kemp, "Looking Ahead: Key Digital Themes for 2023," DataReportal, October 7, 2022, https://datareportal.com/reports/looking-ahead-to-what-2023-holds; GSMA Intelligence, "The State of Mobile Internet Connectivity," February 2022; https://www.gsma.com/mobileeconomy/wp-content/uploads/2022/02/280222-The-Mobile-Economy-2022.pdf.
7 Bank for International Settlements, "Red Book Statistics," https://stats.bis.org/statx/toc/CPMI.html; Bank for International Settlements, "The future monetary system," June 2022, https://www.bis.org/publ/arpdf/ar2022e3.pdf.
8 "Cross-border data flows: Designing a global architecture for growth and innovation," Zurich Insurance, 2022, https://www.zurich.com/en/knowledge/topics/digital-data-and-cyber/why-cross-border-data-flows-matter.
9 GSMA Intelligence, "Digital transformation in a post-pandemic future," 2022.
10 See Andrew Meola, "A look at examples of IoT devices and their business applications in 2023," Insider Intelligence, December 19, 2022, https://www.insiderintelligence.com/insights/internet-of-things-devices-examples/#:~:text=In%20short%2C%20the%20Internet%20of,be%20connected%20to%20the%20IoT; Angus Loten, "Investors Cool on Internet-of-Things Startups, a Tech Conduit for Retailers," *Wall Street Journal*, November 15, 2022; UNCTAD *Digital Economy Report 2021*.
11 Giulia Carosella, et al., "IDC FutureScape: Worldwide Digital Transformation Predictions," October 2021, https://www.idc.com/getdoc.jsp?containerId=US47115521; Petroc Taylor, "Amount of data created, consumed, and stored 2010-2020, with forecasts to 2025," Statista, September 8, 2022, https://www.statista.com/statistics/871513/worldwide-data-created/
12 IDC Spending Guide Sees Worldwide Digital Transformation Investments Reaching $3.4 Trillion in 2026, ICD, October 26, 2022, https://www.idc.com/getdoc.jsp?containerId=prUS49797222; Errin O'Conner, "Top 50 Digital Transformation Statistics and Trends for 2022," EPC Group, January 24, 2022, https://www.epcgroup.net/top-50-digital-transformation-statistics-and-trends-for-2022/.
13 "Shaping the future of digital economy and new value creation," World Economic Forum; McKinsey Global Institute, "Securing Europe's competitiveness: Addressing its technology gap," September 22, 2022.
14 McKinsey & Co., "Digital twins: The Foundation of the enterprise metaverse," October 22, 2022, https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/digital-twins-the-foundation-of-the-enterprise-metaverse. For more, see Mark Sullivan, "What the metaverse will (and won't) be, according to 28 experts," Fast Company, October 26, 2021, https://www.fastcompany.com/90678442/what-is-the-metaverse; *The Economist*, "22 emerging technologies to watch in 2022," November 8, 2021, https://www.economist.com/the-world-ahead/2021/11/08/what-next-22-emerging-technologies-to-watch-in-2022.
15 Simon Bentley and Tony Murdzhev, "Accelerating Sustainability With Virtual Twins," Accenture, January 26, 2021, https://www.accenture.com/us-en/blogs/industry-digitization/accelerating-sustainability-with-virtual-twins. Also "Top 7 IoT Trends That Will Shape the Digital World in 2023," Emeritus.org, December 9, 2022, https://emeritus.org/blog/technology-program-iot-trends-2023/; Peter Bilello, "Outlook 2023: Digital Twins Will No Longer Be an Option," Engineering.com, November 22, 2022, https://www.engineering.com/story/outlook-2023-digital-twins-will-no-longer-be-an-option; Bishwadeep Mitra, "How Digital Twin Solutions Affect Business: The Next Digital Transformation," Emeritus, November 9, 2022, https://emeritus.org/blog/technology-what-is-a-digital-twin/; Oliver Peckham, "Europe's Digital Twins for Earth Kick Off, Crown Jewel Supercomputers in Tow," HPCWire, October 19, 2022, https://www.hpcwire.com/2022/10/19/europes-digital-twins-for-earth-kick-off-crown-jewel-supercomputers-in-tow/; Julie Pattison-Gordon, "Can a Digital Twin of Earth Give Better Climate Insights? Government Technology, November 14, 2022, https://www.govtech.com/products/can-a-digital-twin-of-earth-give-better-climate-insights. https://www.geospatialworld.net/prime/digital-twin-of-earth-to-aid-climate-change-studies/; Bernard Marr, "The Best Examples Of Digital Twins Everyone Should Know About," *Forbes*, June 20, 2022, https://www.forbes.com/sites/bernardmarr/2022/06/20/the-best-examples-of-digital-twins-everyone-should-know-about/.
16 Pak Yiu, Dylan Loh and Francesca Regaldo, "'Crypto winter' to 'ice age'? What 2023 holds for digital assets," *Nikkei Asia*, December 30, 2022, https://asia.nikkei.com/Business/Business-Spotlight/Crypto-winter-to-ice-age-What-2023-holds-for-digital-assets; Bank for International Settlements, "The future monetary system," June 2022, https://www.bis.org/publ/arpdf/ar2022e3.pdf; David J. Farber and Dan Gillmor, "Cryptocurrencies remain a gamble best avoided," *Nikkei Asia*, February 5, 2022, https://asia.nikkei.com/Opinion/Cryptocurrencies-remain-a-gamble-best-avoided.
17 See Bank for International Settlements, "Using CBDCs across borders: lessons from practical experiments," June 2022, https://www.bis.org/publ/othp51.pdf; Maria Demertzis, "Is there social added value in digital currencies?" Presentation at the 10th Meeting of the Fintech Working Group, Bruegel, November 29, 2022, https://www.bruegel.org/sites/default/files/2022-12/Retail%20CBDCs%20and%20private%20crypto%20solutions%20Presenation%20EP%20November%202022_0.pdf; Siddharth Venkataramakrishnan and Martin Arnold, "Report suggests bright future for central bank digital currencies," *Financial Times*, June 30, 2022.
18 U.S. Federal Reserve, "CBDC: Monetary/Digital – Money and Payments: The U.S. Dollar in the Age of Digital Transformation," January 20, 2022, https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf; U.S. Department of the Treasury, "The Future of Money and Payments," September, 2022, https://home.treasury.gov/system/files/136/Future-of-Money-and-Payments.pdf; U.S. Department of the Treasury, "Assessing the Impact of New Entrant Non-bank Firms on Competition in Consumer Finance Markets," Report to the White House Competition Council, November 2022, https://home.treasury.gov/system/files/136/Assessing-the-Impact-of-New-Entrant-Nonbank-Firms.pdf.
19 Steven Levy, "Welcome to the Wet Hot AI Chatbot Summer," *Wired*, January 6, 2023; John Thornhill, "Can generative AI's stimulating powers extend to productivity?" *Financial Times*, January 26, 2023; Erin Griffith and Cade Metz, "A New Area of A.I. Booms, Even Amid the Tech Gloom," *New York Times*, January 7, 2023; Michael Chui, Roger Roberts, and Lareina Yee, "Generative AI is here: How tools like ChatGPT could change your business," McKinsey & Co., December 20, 2022, https://www.mckinsey.com/capabilities/quantumblack/our-insights/generative-ai-is-here-how-tools-like-chatgpt-could-change-your-business.
20 See previous years of this survey. Also Daniel S. Hamilton, *The Transatlantic Digital Economy 2017* (Washington, DC: Center for Transatlantic Relations, 2017); Digital Economy Compass 2018, Statista.com, file:///C:/Users/Owner/Downloads/study_id52194_digital-economy-compass.pdf; International Technology and Innovation Foundation (ITIF), "The Task Ahead of US," http://www2.itif.org/2019-task-ahead.pdf.
21 Ugur Sahin and Ozlem Tureci, "The post-covid future of mRNA therapies," *The Economist*, November 8, 2021, https://www.economist.com/the-world-ahead/2021/11/08/ugur-sahin-and-ozlem-tureci-on-the-future-of-mrna-therapies; Gina Vitale, "Moderna/Merck cancer vaccine shows promise in trials," Chemical and Engineering News, December 20, 2022, https://cen.acs.org/pharmaceuticals/vaccines/ModernaMerck-cancer-vaccine-shows-promise/100/web/2022/12; McKinsey Global Institute, The Bio Revolution: Innovations transforming economies, societies, and our lives, May 2020, https://www.mckinsey.com/industries/life-sciences/our-insights/the-bio-revolution-innovations-transforming-economies-societies-and-our-lives.
22 Nick Webster, "How 3D printing is set to revolutionise reconstructive surgery," The National, October 7, 2022, https://www.thenationalnews.com/weekend/2022/10/07/how-3d-printing-is-set-to-change-the-world-of-reconstructive-surgery/; Paul Hanaphy, "3D Printing Industry Review of the Year," 3D Printing Industry, December 24, 2022, https://3dprintingindustry.com/news/3d-printing-industry-review-of-the-year-december-2022-219144/; Roni Caryn Rabin, "Doctors Transplant Ear of Human Cells, Made by 3-D Printer," *New York Times*, June 2, 2022.

23 Conor Mulcahy, "What is the Future of Digital Healthcare?" Jabil.com, December 21, 2022, https://www.jabil.com/blog/digital-health-infographic.html; Ilona Kickbusch and Anurag Agrawal, "Ungoverned digital advances undermine global healthcare gains," *Financial Times*, October 24, 2021; Markets and Markets, "Synthetic Biology Market Size, Growth by Tools, Applications, and Region – Global Forecasts to 2026," https://www.marketsandmarkets.com/Market-Reports/synthetic-biology-market-889.html McKinsey & Co., "McKinsey Technology Trends Outlook 2022: future of bioengineering," August 2022, https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/the%20top%20trends%20in%20tech%202022/McKinsey-Tech-Trends-Outlook-2022-Bioengineering.pdf.
24 John Thornhill, "Code-generating software can spur a cognitive revolution," *Financial Times*, September 16, 2021; McKinsey and Co., "McKinsey Tech Trends Outlook 2022: next generation software development," August 2022; McKinsey & Co., "McKinsey Technology Trends Outlook 2022: Applied AI," August 2022, https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/the%20top%20trends%20in%20tech%202022/McKinsey-Tech-Trends-Outlook-2022-Applied-AI.pdf; "The new age of AI," *The Economist*, June 12, 2022; Irving Wladawsky-Berger, "The Disruptive Economics of AI," MIT Initiative on the Digital Economy," December 9, 2022, https://medium.com/mit-initiative-on-the-digital-economy/the-disruptive-economics-of-ai-620178817b9a.
25 Nicole Wetsman, "DeepMind found the structure of nearly every protein known to science," *The Verge*, July 28, 2022, https://www.theverge.com/2022/7/28/23280743/deepmind-alphafold-protein-database-alphabet.
26 Michael Reddy, "Digital Transformation in Healthcare in 2022: 7 Key Trends," Digital Authority Partners, December 7, 2022, https://www.digitalauthority.me/resources/state-of-digital-transformation-healthcare/.
27 Hannah Kuchler, "BioNTech buys UK AI start-up InstaDeep in £562m deal," *Financial Times*, January 10, 2023.
28 "Healthcare Artificial Intelligence Software, Hardware, and Services Market to Surpass $34 Billion Worldwide by 2025, According to Tractica," Business Wire, August 27, 2018, https://www.businesswire.com/news/home/20180827005149/en/.
29 Mike Thomas, "7 Dangerous Risks of Artificial Intelligence," Built In, July 6, 2021, https://builtin.com/artificial-intelligence/risks-of-artificial-intelligence.
30 U.S.-E.U. Trade and Technology Council. "US-EU Trade and Technology Council Inaugural Joint Statement." White House Briefing Room Statements and Releases. September 29, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/29/u-s-eu-trade-and-technology-council-inaugural-joint-statement/.
31 TTC Joint Roadmap on Evaluation and Measurement Tools for Trustworthy AI and Risk Management, https://www.nist.gov/system/files/documents/2022/12/04/Joint_TTC_Roadmap_Dec2022_Final.pdf.
32 Tina Highfill and Christopher Surfield, "New and Revised Statistics of the U.S. Digital Economy, 2005–2021, U.S. Bureau of Economic Analysis, November 2022, https://www.bea.gov/system/files/2022-11/new-and-revised-statistics-of-the-us-digital-economy-2005-2021.pdf.
33 Atomico, "State of European Tech 2022," https://stateofeuropeantech.com/1.european-teach-a-new-reality/1.2-tech-motor-for-progress#C1-2-purpose-driven-tech-on-the-rise-again.
34 Atomico.
35 Atomico.
36 Dutta and Lanvin.
37 For a related survey, see IMD World Digital Competitiveness Ranking 2022, https://www.imd.org/centers/world-competitiveness-center/rankings/world-digital-competitiveness/.
38 Jeongmin Seong, Olivia White, Jonathan Woetzel, Sven Smit, Tiago Devesa, Michael Birshan, and Hamid Samandari, "Global flows: The ties that bind in an interconnected world," McKinsey & Co., November 15, 2022, https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/global-flows-the-ties-that-bind-in-an-interconnected-world; OECD, "The impact of digitalisation on trade," https://www.oecd.org/trade/topics/digital-trade/; C. Cadestin and S. Miroudot, "Services exported together with goods," OECD Trade Policy Papers, No. 236, Paris, 2020, https://dx.doi.org/10.1787/275e520a-en; Erik van der Marel, "Globalization Isn't in Decline: It's Changing," ECIPE Policy Brief 6/2020, https://ecipe.org/wp-content/uploads/2020/08/ECI_20_PolicyBrief_06_2020_LY06.pdf; Rachel F. Fefer, Wayne M. Morrison, Shayerah Ilias Akhtar, "Digital Trade and U.S. Trade Policy," Congressional Research Service, May 21, 2019, https://fas.org/sgp/crs/misc/R44565.pdf.
39 OECD, "The impact of digitalisation on trade;" Cadestin and Miroudot; van der Marel.
40 See Martin Smeets, ed., *Adapting to the digital trade era: challenges and opportunities* (Geneva: WTO, 2021); WTO, *World Trade Report 2019*; OECD, *Global Value Chains and Trade*, 2021, https://www.oecd.org/trade/topics/global-value-chains-and-trade/.
41 The U.S. Bureau of Economic Analysis (BEA) defines those services as including three categories of international trade in services: telecommunications services, computer services, and charges for the use of intellectual property associated with computer software. See U.S. Bureau of Economic Analysis, Defining and Measuring the Digital Economy Data Tables 1997-2017, April 2, 2019. For an updated approach, see Highfill and Surfield, also Shari A. Allen and Maryam Fatima, "U.S. International Services: Trade in Services in 2021 and Services Supplied Through Affiliates in 2020," U.S. Bureau of Economic Analysis, October 2022, https://apps.bea.gov/scb/2022/10-october/1022-international-services.htm
42 This approach draws on work by UNCTAD, the OECD, the WTO and the IMF. See Javier López-González, "The changing nature of digital trade, current and future barriers and ideas to overcome them," Woodrow Wilson Center, April 21, 2021, https://www.wilsoncenter.org/article/changing-nature-digital-trade-current-and-future-barriers-and-ideas-overcome-them. Also BEA International Data, https://www.bea.gov/iTable/index_ita.cfm; Jessica R. Nicholson, " New BEA Estimates of International Trade in Digitally Enabled Services," May 24, 2016, Bureau of Economic Analysis, http://www.esa.doc.gov/economic-briefings/new-bea-estimates-international-trade-digitally-enabled-services.
43 The OECD/IMF/WTO Handbook defines digital trade as "trade that is digitally ordered and/or digitally delivered," yet data statistics have not yet been aligned to this definition. That leaves us with digitally-enabled services as the default metric. For more, see IMF/OECD, "How to move forward on measuring digital trade," Thirty-Second Meeting of the IMF Committee on Balance of Payments Statistics, Thimphu, Bhutan October 29–November 1, 2019, https://www.imf.org/external/pubs/ft/bop/2019/pdf/19-07.pdf; Joshua P. Meltzer, "The Importance of the Internet and Transatlantic Data Flows for U.S. and EU Trade and Investment," Brookings Institution, Global Economy and Development Working Paper 79, October 2014; Ryan Noonan, "Digitally Deliverable Services Remain an Important Component of U.S. Trade," Washington, DC. U.S. Department of Commerce, Economics and Statistics Administration, May 28, 2015, available at http://www.esa.gov/economic-briefings/digitally-deliverable-services-remain-important-component-us-trade; U.S. Department of Commerce, "Measuring the Value of Cross-Border Data Flows," September 2016, https://www.ntia.doc.gov/files/ntia/publications/measuring_cross_border_data_flows.pdf ; United States International Trade Commission, "Digital Trade in the U.S. and Global Economies, Part 2", Pub.4485, Investigation No.332-540, August 2014, p.47; Jessica R. Nicholson and Ryan Noonan, "Digital Economy and Cross-Border Trade: The Value of Digitally-Deliverable Services," Washington, DC. U.S. Department of Commerce, Economics and Statistics Administration, ESA Issue Brief # 01-14, January 27, 2014, available at http://www.esa.doc.gov/sites/default/files/digitaleconomyandcross-bordertrade.pdf.
44 UNCTAD, "Supporting countries to measure the digital economy for development," December 2, 2022, https://unctad.org/news/supporting-countries-measure-digital-economy-development; UNCTAD, "International trade in digitally-deliverable services, value, shares and growth, annual," https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=158358; UNCTAD, International trade in ICT services, value, shares and growth, annual, https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=158359.
45 Ibid; Meltzer, op. cit.; Ker and Mazzini, op. cit., p. 71.
46 Allen and Fatima.
47 Allen and Fatima.
48 Note that these figures are sourced from Eurostat and can vary from the corresponding U.S.-EU bilateral trade figures reported by the U.S. Bureau of Economic Analysis. Differences can occur in how services are measured, classified, and attributed to partner countries, resulting in asymmetries in the two data sources. For more information on these asymmetries, please see Eurostat report, "Transatlantic Trade in Services: Investigating Bilateral Asymmetries in EU-US Trade Statistics, 2017 edition," https://ec.europa.eu/eurostat/documents/7870049/8544118/KS-GQ-17-016-EN-N.pdf/eaf15b03-5dcf-48dd-976f-7b4169f08a9e.
49 Allen and Fatima.
50 Michael Mandel, "Europe App Economy Update 2021," Progressive Policy Institute, May 25, 2022, https://www.progressivepolicy.org/blogs/europe-app-economy-update-2021/; Michael Mandel and Jordan Shapiro, "US App Economy Update 2021," Progressive Policy Institute, May 25, 2022, https://www.progressivepolicy.org/wp-content/uploads/2022/05/PPI_US-App-Economy-Update-2022_V4.pdf.
51 Mandel.
52 Mandel and Shapiro.
53 Mandel.
54 Statista, "Apps-worldwide," October 2022, https://www.statista.com/outlook/dmo/app/worldwide.
55 UNCTAD, "Measuring the value of e-commerce," October 21, 2022, Non-paper for the third meeting of the Trade and Development Board Working Group on Measuring E-Commerce and the Digital Economy, https://unctad.org/system/files/information-document/Measuring_value_ecommerce.pdf.
56 See UNCTAD, "In Search of Cross-Border E-Commerce Trade Data," Technical Note NO 6 Unedited, April 2016, available at http://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d06_en.pdf.
57 UNCTAD, "Global e-commerce jumps to $26.7 trillion, fuelled by COVID-19," May 3, 2021, https://news.un.org/en/story/2021/05/1091182; UNCTAD, " Estimates of Global E-Commerce 2019 and Preliminary Assessment of Covid-19 Impact and Online Retail 2020," March 2021, https://unctad.org/system/files/official-document/tn_unctad_ict4d18_en.pdf.
58 The Paypers, "Cross-Border Payments and Ecommerce Report 2022–2023," December 2022, https://thepaypers.com/reports/cross-border-payments-and-ecommerce-report-20222023/r1259465.
59 Research and Markets, "Global Business-to-Business E-commerce Market Size, Share & Trends Analysis Report by Deployment Model (Intermediary-oriented, Supplier-oriented), by Application, by Region, and Segment Forecasts, 2021-2028," June 2021, https://www.researchandmarkets.com/reports/5028717/global-business-to-business-e-commerce-market.
60 Mark Brohan, Jason Smith, "More European companies engage in B2B ecommerce," Digital Commerce 360, December 6, 2022, https://www.digitalcommerce360.com/2022/12/06/more-european-companies-engage-in-b2b-ecommerce/; U.S. Department of Commerce, "European Retail eCommerce Consumer Snapshot," https://www.trade.gov/european-retail-ecommerce-consumer-forecast; Ethan Cramer-Flood, "US B2B Ecommerce Forecast 2022–2026: A Rapidly Growing Slice of an Enormous Market," Insider Intelligence, October 18, 2022, https://www.insiderintelligence.com/content/us-b2b-ecommerce-forecast-2022-2026; Forrester, "US B2B E-Commerce Will Reach An Estimated $3 Trillion By 2027," June 8, 2022; "Europe B2C e-Commerce Market Opportunities Report 2022: Market is Expected to Grow by 14.96% to Reach $1,010.0 Billion in 2022 - Forecasts to 2026 - ResearchAndMarkets.com," Business Wire, October 19, 2022, https://www.businesswire.com/news/home/20221019005857/en/Europe-B2C-e-Commerce-Market-Opportunities-Report-2022-Market-is-Expected-to-Grow-by-14.96-to-Reach-1010.0-Billion-in-2022---Forecasts-to-2026---ResearchAndMarkets.com.
61 The Paypers, "Cross-Border Payments and Ecommerce Report 2022–2023," December 2022, https://thepaypers.com/reports/cross-border-payments-and-ecommerce-report-20222023/r1259465; Pymnts, "Cross-Border B2B Payments Account for 26% of UK and US Firms' Annual Sales," March 4, 2022, https://www.pymnts.com/antitrust/2022/uks-cma-ramps-up-apple-google-antitrust-probe/.
62 Statista Digital Market Outlook 2020, eCommerceDB.com. ALSO 2023 http://cbre.vo.llnwd.net/grgservices/secure/CBRE%20Global%20E-Commerce%20Outlook%202022_Update.pdf.
63 Cross-Border Commerce Europe, "TOP 16 Cross-Border EU Countries 2022," https://www.cbcommerce.eu/publication/top-16-cross-border-eu-countries-2022/; Sara Lone, "The European Cross-Border Ecommerce Market – Key Trends and Developments," in The Paypers, ; Cross-Border Commerce Europe, "Top 16 Cross-Border EU Countries 2021," https://www.cbcommerce.eu/product/top-16-cross-border-eu-countries/.
64 Cross-Border Commerce Europe, "4th edition of the "TOP 500 Cross-Border Retail Europe": an annual ranking of the top 500 European cross-border online shops," March 12, 2022, https://www.cbcommerce.eu/press-releases/4th-edition-of-the-top-500-cross-border-retail-europe-an-annual-ranking-of-the-top-500-european-cross-border-online-shops/.
65 The OECD definition of an online platform is "digital services that facilitate interactions between two or more distinct but interdependent sets of users (whether 6 firms or individuals) who interact through the service via the internet." OECD, "Online Platforms: A Practical Approach to Their Economic and Social Impacts," Paris, 2018.

66 Anuj Saush, Mark Fenwick, and Erik P. M. Vermeulen, "The Platform Economy," European Corporate Governance Institute/The Conference Board, 2021, https://www.conference-board.org/pdfdownload.cfm?masterProductID=27309; Jennifer Schenker, "The Platform Economy," The Innovator, January 19, 2019.
67 Digital Economy 2021, op. cit.; OECD, "Digital Enablers of the Global Economy: Background Paper for the CDEP Ministerial Meeting," OECD Digital Economy Papers, November 2022 No. 337, https://www.oecd.org/publications/digital-enablers-of-the-global-economy-f0a7baaf-en.htm.
68 Zoltan J. Acs, Abraham K. Song, László Szerb, David B. Audretsch, and Éva Komlósi, "The evolution of the global digital platform economy: 1971–2021," *Small Business Economics*, November 13, 2021, https://link.springer.com/article/10.1007/s11187-021-00561-x; Zoltan J. Acs, László Szerb, Abraham K. Song, Éva Komlósi, Esteban Lafuente, "The Digital Platform Economy Index 2020," Global Entrepreneurship and Development Institute, December 2020, https://thegedi.org/wp-content/uploads/2020/12/DPE-2020-Report-Final.pdf.
69 Ibid; W. Naudé, "Is European Entrepreneurship in Crisis?" IZA Working Paper, DP 9817 (2016).
70 Janet Bush, ed., "Global flows: The ties that bind in an interconnected world," McKinsey Global Institute, November 2022; Zurich Insurance, "Cross-border data flows."
71 The White House, "FACT SHEET: President Biden Signs Executive Order to Implement the European Union-U.S. Data Privacy Framework," October 7, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/10/07/fact-sheet-president-biden-signs-executive-order-to-implement-the-european-union-u-s-data-privacy-framework/; Rachel F. Fefer and Kristin Archick, "U.S.-EU Trans-Atlantic Data Privacy Framework," Congressional Research Service, June 7, 2022, https://crsreports.congress.gov/product/pdf/IF/IF11613; Emily Benson and Elizabeth Duncan, "Temporarily Shielded? Executive Action and the Transatlantic Data Privacy Framework," CSIS, October 7, 2022, https://www.csis.org/analysis/temporarily-shielded-executive-action-and-transatlantic-data-privacy-framework; Digital Europe, "Schrems II Impact Survey Report," November 20, 2020, https://www.digitaleurope.org/resources/schrems-ii-impact-survey-report/.
72 See Diane Coyle and Annabel Manley, "What is the Value of Data? A review of empirical methods," Bennett Institute, University of Cambridge, July 2022, https://www.bennettinstitute.cam.ac.uk/wp-content/uploads/2022/07/policy-brief_what-is-the-value-of-data.pdf; OECD, "Cross-border Data Flows: Taking Stock of Key Policies and Initiatives," October 2022, https://www.oecd-ilibrary.org/science-and-technology/cross-border-data-flows_5031dd97-en.
73 *Digital Economy Report 2021*, op. cit.
74 James Manyika, Susan Lund, Jacques Bughin, Jonathan Woetzel, Kalin Stamenov, and Dhruv Dhingra, "Globalization: The new era of global flows," McKinsey Global Institute, February 24, 2016, https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/Digital-globalization-The-new-era-of-global-flows,.
75 See "Measuring the Value of Cross-Border Data Flows," Economics and Statistics Administration and the National Telecommunications and Information Administration, U.S. Department of Commerce, September 2016, p. 21, https://www.ntia.doc.gov/files/ntia/publications/measuring_cross_border_data_flows.pdf. D. Coyle, et al., "The Value of Data: Policy Implications," Bennett Institute, University of Cambridge, February 26, 2020, https://www.bennettinstitute.cam.ac.uk/media/uploads/files/Value_of_data_Policy_Implications_Report_26_Feb_ok4noWn.pdf.
76 Coyle, et al.; Manyika, et al.; Michael Mandel, "Data, Trade and Growth," Progressive Policy Institute, April 2014, http://www.progressivepolicy.org/wp-content/uploads/2014/04/2014.04-Mandel_Data-Trade-and-Growth.pdf.
77 Manyika, et al.
78 For more on the implications of this decision, see Daniel S. Hamilton, "Europe's new privacy ruling will help fragment the global economy," *Washington Post*, July 22, 2020, https://www.washingtonpost.com/politics/2020/07/22/europes-new-privacy-ruling-will-help-fragment-global-economy/.
79 Ker and Mazzini, pp. 71, 78, 79.
80 Michael Rasch, "Der grösste Internet-Knotenpunkt der nördlichen Hemisphäre ist in Frankfurt – würde er einen Atomschlag überstehen?" *Neue Zürcher Zeitung*, October 15, 2022, https://www.nzz.ch/wirtschaft/groesster-internet-knotenpunkt-was-waere-nach-einem-atomschlag-ld.1703243; Telegeography, The State of the Network 2022; Telegeography Workshop, Pacific Telecommunications Council, January 19, 2022, https://www2.telegeography.com/hubfs/2022/Presentations/2022%20PTC%20Workshop.pdf; On land, the United States accounts for about 40% and Europe for an additional 35% of so-called colocation data centers.
81 Synergy Research Group, "Pipeline of Over 300 New Hyperscale Data Centers Drives Healthy Growth Forecasts," March 23, 2022, https://www.srgresearch.com/articles/pipeline-of-over-300-new-hyperscale-data-centers-drives-healthy-growth-forecasts; John Edwards, "What You Need To Know About Hyperscalers," Information Week, December 19,2022, https://www.informationweek.com/cloud/what-you-need-to-know-about-hyperscalers.
82 Reegan Barnett, "Hyperscale Data Centers - What Are They and Why Should You Care," Raritan Blog, February 1, 2018, https://www.raritan.com/blog/detail/hyperscale-data-centers-what-are-they-and-why-should-you-care; Mark Haranas, "10 Data Center Companies You Need To Watch In 2022," CRN, January 10, 2022, https://www.crn.com/slide-shows/data-center/10-data-center-companies-you-need-to-watch-in-2022/11; Fortinet, "What is Hyperscale?" https://www.fortinet.com/resources/cyberglossary/hyperscale; LD Investments, "Hyperscale: Opportunity Or Threat For Data Center Operators?" Seeking Alpha, January 29, 2021, https://seekingalpha.com/article/4401956-hyperscale-opportunity-threat-for-data-center-operators; Equinix.com; Arthur Sullivan, "Europe is seeing a data center boom. But can the environment sustain it?" Deutsche Welle, September 10, 2021, https://www.dw.com/en/europe-is-seeing-a-data-center-boom-but-can-the-environment-sustain-it/a-59139118#:~:text=The%20traditional%20hot%20spots%20for,services%20is%20changing%20the%20dynamic; Synergy Research Group, "Pipeline of Over 300 New Hyperscale Data Centers Drives Healthy Growth Forecasts," March 23, 2022, https://www.srgresearch.com/articles/pipeline-of-over-300-new-hyperscale-data-centers-drives-healthy-growth-forecasts.
83 Synergy Research Group, "Pipeline."
84 Synergy Research Group, "Virginia Still Has More Hyperscale Data Center Capacity Than Either Europe or China," September 6, 2022, https://www.srgresearch.com/articles/virginia-still-has-more-hyperscale-data-center-capacity-than-either-europe-or-china. https://blog.telegeography.com/does-70-of-the-worlds-internet-traffic-flow-through-virginia
85 Synergy Research Group, "Virginia." Tim Stronge, "Does 70% of the World's Internet Traffic Flow Through Virginia?" Telegeography, May 30, 2019, https://blog.telegeography.com/does-70-of-the-worlds-internet-traffic-flow-through-virginia.
86 Synergy Research Group, "Pipeline"; Sullivan.
87 F. Montevecchi, T. Stickler, R. Hintemann, S. Hinterholzer, S., *Energy-efficient Cloud Computing Technologies and Policies for an Eco-friendly Cloud Market*. Final Study Report for the European Commission, Vienna, 2020, https://digital-strategy.ec.europa.eu/en/library/energy-efficient-cloud-computing-technologies-and-policies-eco-friendly-cloud-market; Synergy, "Pipeline"; Pieter Haeck and Antonia Zimmermann, "Europe's hidden energy crisis: data centers," Politico, October 3, 2022, https://www.politico.eu/article/data-center-energy-water-intensive-tech/; Ivy Main, "Virginia has a data center problem," *Virginia Mercury*, December 9, 2022, https://www.virginiamercury.com/2022/12/09/virginia-has-a-data-center-problem/.
88 Linda Hardesty, "European cloud providers take hit from AWS, Google, Azure, says Synergy," Fierce Telecom, September 23, 2021, https://www.fiercetelecom.com/platforms/european-cloud-providers-take-hit-from-aws-google-azure-says-synergy; European Commission, "Cloud computing," https://digital-strategy.ec.europa.eu/en/policies/cloud-computing.
89 Synergy Research Group, "European Cloud Providers Continue to Grow but Still Lose Market Share," September 27, 2022, https://www.srgresearch.com/articles/european-cloud-providers-continue-to-grow-but-still-lose-market-share.
90 Equinix, "Global Interconnection Index 2023," 2022, https://www.equinix.com/gxi-report; European Commission, "5G for Europe's Digital and Green Recovery," January 14, 2021, https://digital-strategy.ec.europa.eu/en/library/5g-europes-digital-and-green-recovery; Accenture.
91 Dan Swinhoe, "Thales details French sovereign cloud joint venture with Google: S3NS to operate three data centers in France," Data Center Dynamics, July 4, 2022, https://www.datacenterdynamics.com/en/news/thales-details-french-sovereign-cloud-joint-venture-with-google/; Thales, "Thales Introduces S3NS in Partnership with Google Cloud and Unveils Its Offering in a First Step Towards the French Trusted Cloud Label," June 30, 2022, https://www.thalesgroup.com/en/group/press_release/thales-introduces-s3ns-partnership-google-cloud-and-unveils-its-offering-first; Caroline Donnelly, "Vodafone and Google Cloud collaboration gives rise to AI Booster platform," Computer Weekly, July 6, 2022, https://www.computerweekly.com/news/252522379/Vodafone-and-Google-Cloud-collaboration-gives-rise-to-AI-Booster-platform; Amazon, "AWS and Atos Strengthen Collaboration with New Strategic Partnership to Transform the Infrastructure Outsourcing Industry," November 30, 2022, https://press.aboutamazon.com/2022/11/aws-and-atos-strengthen-collaboration-with-new-strategic-partnership-to-transform-the-infrastructure-outsourcing-industry; Richard Waters, "Every company may soon be a cloud company," *Financial Times*, December 2, 2021; Oliver Noyan, "Europe's Cloud Dreams Come Crashing Down to Earth," Center for European Policy Analysis, https://cepa.org/europes-cloud-dreams-come-crashing-down-to-earth/; Alice Pannier, "The Changing Landscape of European Cloud Computing: Gaia-X, the French National Strategy, and EU Plans," Briefings de l'Ifri, July 22, 2021, https://www.ifri.org/sites/default/files/atoms/files/pannier_european_cloud_computing_2021.pdf.
92 Jill C. Gallagher, "Undersea Telecommunication Cables: Technology Overview and Issues for Congress," Congressiona Research Service, September 13, 2022, https://crsreports.congress.gov/product/pdf/R/R47237; The International Cable Protection Committee, "Submarine Cables and BBNJ (Biodiversity in areas Beyond National Jurisdiction)", 2016, p. 1, https://www.un.org/depts/los/biodiversity/prepcom_files/ICC_Submarine_Cables_& _BBNJ_August_2016.pdf; see also Maritime Awareness Project, "Factsheet: Submarine Cables," https://map.nbr.org/ 2018/07/submarine-cables/; Rona Rita David, "Submarine Cables: Risks and Security Threats," Energy Industry Review, March 25, 2022, https://energyindustryreview.com/analysis/submarine-cables-risks-and-security-threats/.
93 See Matt Burgess, "The Most Vulnerable Place on the Internet," *Wired*, November 2, 2022, https://www.wired.com/story/submarine-internet-cables-egypt/; Edward Stringer, "Putin knows that undersea cables are the west's Achilles heel," *Financial Times*, November 4, 2022; Jayne Miller, "Satellites and Submarine Cables: Myth vs. Reality," Telegeography, https://blog.telegeography.com/satellites-and-submarine-cables-myth-vs.-reality, January 5, 2022; Clifford Holliday, "Re-Imagining Telecom Subsea Cables," *SubTel Forum Magazine*, February 2020; David W. Brown, "10 Facts about the Internet's Undersea Cables," Mental Floss, Nov 12, 2015, http://mentalfloss.com/article/60150/10-facts-about-internets-undersea-cables; Geof Wheelwright, "Undersea cables span the globe to send more data than satellites," *Financial Times*, November 2, 2016; Nicole Starosielski, "In our Wi-Fi world, the internet still depends on undersea cables," The Conversation, November 3, 2015, https://theconversation.com/in-our-wi-fi-world-the-internet-still-depends-on-undersea-cables-49936. Telegeography, "Submarine Cables Frequently Asked Questions," https://www2.telegeography.com/submarine-cable-faqs-frequently-asked-questions.
94 Alan Mauldin, "Economic Indicators and the Future Submarine Cable Industry," Telegeography, Presentation to Submarine Networks World – Singapore, September 7, 2022, https://www2.telegeography.com/hubfs/2022/Presentations/2022%20Submarine%20Networks%20World.pdf?utm_campaign=Prospects%3A%20Internet%202&utm_medium=email&_hsmi=2&_hsenc=p2ANqtz--UMfrCu9I8ID2URR6939WoVMlQVm5rwnzuNrkCgJ51jZj4darRnz1t5rO7zDbnPLGqVT6QqNfNSo6hYhotwSqG5WkdJw&utm_content=2&utm_source=hs_email.
95 Alan Mauldin, "Cutting off Europe? A Look at How the Continent Connects to the World," Telegeography, October 13, 2022, https://blog.telegeography.com/cutting-off-europe-a-look-at-how-the-continent-connects-to-the-world.
96 Ibid; Tim Stronge, "Trans-Atlantic Submarine Corridor," Telegeography, June 2022, https://www2.telegeography.com/hubfs/2022/Presentations/Trans-Atlantic%20Submarine%20Corridor%20-%20June%202022%20Webinar.pdf; Wayne Nielsen, "North Atlantic Regional Roundup," Presentation to the 2017 Pacific Telecommunications Council, January 2017, https://www.ptc.org/assets/uploads/papers/ptc17/PTC17_Sun_Submarine%20WS_Nielsen.pdf; http://aquacomms.com/wp-content/uploads/P54-55-Aqua-Comms-advertorial.pdf; https://cacm.acm.org/magazines/2020/1/241709-how-the-internet-spans-the-globe/fulltext?mobile=false.
97 Submarine Telecoms Forum, "2022/23 Industry Report," October 2022, https://subtelforum.com/industry-report/.
98 Submarine Cable Networks, "Grace Hopper," https://www.submarinenetworks.com/en/systems/trans-atlantic/grace-hopper; Submarine Cable Networks, "Amitié/AEC-3," https://www.submarinenetworks.com/en/systems/trans-atlantic/amitie.
99 Telecom TV, "What's up with... Orange, Huawei in Europe, the Gateway to Europe," November 14, 2022, https://www.telecomtv.com/content/security/what-s-up-with-orange-huawei-in-europe-the-gateway-to-europe-45945/.
100 Tim Stronge, "Trans-Atlantic Submarine Corridor"; Submarine Telecoms Forum, "2022/23 Industry Report," October 2022, https://subtelforum.com/industry-report/.
101 Mauldin, "Cutting Off Europe".
102 Ibid.

103 Submarine Telecoms Forum, "Arctic Fibre-Optic Cable Secures First Investment," December 2, 2022, https://subtelforum.com/arctic-fibre-optic-cable-secures-first-investment/; Luca Bertuzzi, "EU eyes Arctic internet cable to connect Europe to Asia via Alaska," Euractiv, October 14, 2022, https://www.euractiv.com/section/digital/news/eu-eyes-arctic-internet-cable-to-connect-europe-to-asia-via-alaska/.
104 Ibid.
105 Peter O'Brien, "France tightens subsea cable security amid growing fear of sabotage," *Politico*, October 13, 2022, https://www.politico.eu/article/france-tighten-subsea-cable-security-fear-sabotage-pipeline-gas-leak; Mark Scott, "Will Russia attack undersea internet cables next?" *Politico*, September 29, 2022, https://www.politico.eu/article/everything-you-need-to-know-about-the-threat-to-undersea-internet-cables/.
106 Adam Entous, Julian E. Barnes and Adam Goldman, "Intelligence Suggests Pro-Ukrainian Group Sabotaged Pipelines, U.S. Officials Say," *New York Times*, March 7, 2023; Burgess; Christian Bueger, Tobias Liebetrau, Jonas Franken, "Security threats to undersea communications cables and infrastructure – consequences for the EU," European Parliament, April 2022, https://www.europarl.europa.eu/RegData/etudes/IDAN/2022/702557/EXPO_IDA(2022)702557_EN.pdf.
107 Burgess; Bueger et al.
108 TeleGeography expects their share to grow to 78% by 2027. Telegeography, "State of the Network 2021," January 2021, https://www2.telegeography.com/hubfs/assets/Ebooks/state-of-the-network-2021.pdf. Also Andrew Blum and Carey Baraka, "Sea change:
Google and Meta's new subsea cables mark a tectonic shift in how the internet works, and who controls it," Rest of world, May 10, 2022, https://restofworld.org/2022/google-meta-underwater-cables/.
109 Equinix, "Global Interconnection Index, 2023."
110 Equinix, "Global Interconnection Index, 2023"; Jim Poole, "Submarine cable boom fueled by new tech, soaring demand," Network World, March 6, 2018, https://www.networkworld.com/article/3260784/lan-wan/submarine-cable-boom-fueled-by-new-tech-soaring-demand.html.
111 See Pacific Telecommunications Council Secretariat, "Is this the end of the internet as we know it?" January 3, 2019, https://www.ptc.org/2019/01/is-this-the-end-of-the-internet-as-we-know-it/.

6

The 50 U.S. States: European-Related Jobs, Trade and Investment

America's highly diversified economy – whether goods or services – combined with its wealthy consumers, sets it apart from the rest and is one key reason why the United States remains the global leader in attracting foreign capital.

The odds of a U.S. recession in 2023 are relatively high due to the Federal Reserve's fight against inflation and attendant tightening of monetary policies. Since March 2022, the Federal Reserve has raised the federal funds rate eight times, precipitating a broad slowdown in U.S. economic activity, notably among more credit-sensitive sectors like real estate and construction.

That said, two points are worth highlighting. First, U.S. recessions are not uncommon – starting with the economic downturn in 1945, the U.S. economy has experienced 13 different recessions since World War II. Recessions are part of the economic life of a dynamic economy. Most analysts believe any U.S. recession in 2023 will be brief and fairly shallow, before rebounding in the latter part of the year. Second, notwithstanding periodic cyclical slowdowns, the U.S. economy remains one of the most dynamic and resilient economies in the world. No country produces as much output (more than $25 trillion in 2022) with so few people (less than 5% of the world population) than the United States. The United States is not only large, it is wealthy, with a per capita income of over $70,000 in 2022. According to the latest Federal Reserve *Flow of Funds* data, U.S. household net worth totaled a staggering $143 trillion at the end of 2022. It is these attributes that attract European firms to invest in the United States.

Another reason: the U.S. economy is also extraordinarily diversified, which gives European firms wide breadth in terms of participating in and leveraging the U.S. market. From agriculture to aerospace, and everything in between, the United States remains a global leader and a prime market for non-U.S. firms. Energy, education, health care, life sciences, biotechnology, finance, manufacturing, steel, R&D, entertainment, transportation, social media – pick your sector, and there's a good chance there is a mature or budding firm in the United States. America's highly diversified economy – whether goods or services – combined with its wealthy consumers, sets it apart from the rest and is one key reason why the United States remains the global leader in attracting foreign capital.

Drivers of foreign investment into the U.S.

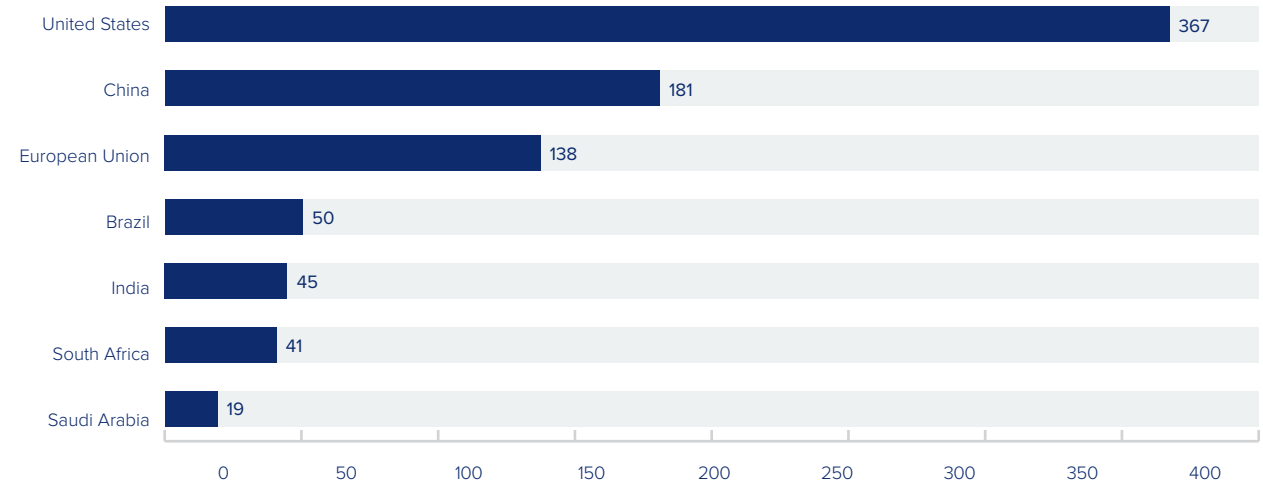
- **Large and wealthy consumer base**
- **Skilled workforce**
- **Rule of law and strong institutions**
- **Advanced technological readiness**
- **World-class higher education**
- **University-industry R&D partnerships**
- **Entrepreneurship culture**
- **Respect for intellectual property**
- **Stable and supportive business environment**

To this point, according to the latest figures from the UN, foreign direct investment (FDI) inflows to the United States, after falling sharply in 2020 due to the pandemic-induced global recession, rebounded sharply in 2021, totaling a record $357 billion. In 2021, foreign companies invested twice as much in the United States ($367 billion) as they did in China ($181 billion) (Table 1). The United States has ranked number one in the world for FDI inflows for 16 consecutive years.

As Table 2 depicts, no country has attracted more FDI this century than the United States, taking in roughly $5 trillion cumulatively since 2000, more than the total for the next two countries (China and the UK) combined. On an aggregate basis, the U.S. attracted roughly 17% of total global foreign direct investment between 2000 and 2021. China was a distant second, with a global share of 7.8% followed by the U.K. (5.9%).

Multiple factors underpin America's dominance in foreign investment flows. First, as we have mentioned, is America's large and wealthy consumer base, with a population of roughly 335 million and per capita income of over

Table 1. FDI Inflows ($Billions)



Source: United Nations Conference on Trade and Development (UNCTAD). Data for 2021.

$70,000. Second, the United States boasts a hypercompetitive and dynamic economy, driven by strong institutions, advanced technological readiness, world-class universities, a strong capacity and culture of entrepreneurship, and a dense web of university-industry collaborative activities in research and development (R&D). The ability to attract R&D from companies abroad is important to the innovative culture of the U.S. economy. R&D performed by affiliates of foreign companies accounts for roughly 15% of total R&D conducted by all businesses in the United States. European companies account for two thirds of foreign-funded R&D in the United States.

Additionally, European companies investing in the United States gain access to a desirable pool of skilled, flexible, and productive labor. We estimate that U.S. jobs supported directly by affiliates of foreign companies totaled 8 million in 2021, or about 6% of total private industry employment in the United States. European companies accounted for 61% of that figure, or nearly 5 million jobs.

Meanwhile, transparent rule of law, sophisticated accounting, auditing, and reporting standards, secure access to credit, ease of entrepreneurship, and respect for intellectual property rights have all contributed to the stable and supportive business environment in the United States.

Jobs directly supported by European companies in the U.S.
(2021 estimate)
5 million

Table 2. Cumulative Investment Inflows 2000-2021 rankings

Rank	Economy	Cumulative Flows ($Billions)	Percent of World Total
1	United States	4,957.3	16.8
2	China	2,313.1	7.8
3	United Kingdom	1,743.3	5.9
4	Hong Kong	1,662.8	5.6
5	Singapore	1,056.1	3.6
6	Germany	1,002.0	3.4
7	Brazil	993.8	3.4
8	Canada	923.6	3.1
9	Ireland	831.9	2.8
10	Australia	744.7	2.5

Source: United Nations Conference on Trade and Development (UNCTAD).
Data as of January 2023.

European firms maintained their dominant foreign investment position in the United States in 2022.

Total European FDI stock in the U.S.
(2021)
$2.9 trillion

64%
of total FDI in the U.S.

Europe's Stakes in the United States

European firms maintained their dominant foreign investment position in the United States in 2022. In the first three quarters of the year, FDI inflows from Europe represented over 50% of total U.S. inflows. FDI inflows from Europe receded from the robust levels of 2021, declining to $121 billion in the January-September 2022 period. Annualizing data for the first nine months of last year, U.S. FDI inflows from Europe are estimated to come in at $170 billion of new investment in 2022, compared with $267 billion in 2021.

Investment inflows from individual European countries to the United States in 2022 was generally downward. Some countries posted growth in FDI flows; others saw a pullback. The traditional European leaders in terms of FDI inflows to the U.S. – the Netherlands, Germany, the United Kingdom, Ireland, and Italy – posted year-over-year decreases last year, while investment from France rebounded.

In 2023, we expect FDI inflows to the U.S. to "normalize" and trend higher in part due to the incentives in the U.S. Inflation Reduction Act, which strongly encourages U.S. in-country production via tax credits and subsidies. Domestic content requirements around renewable energy have run afoul of EU policymakers but have nevertheless captured the attention of European multinationals looking to expand their footprint in the massive U.S. market. U.S.-EU discussions are ongoing to determine how and whether products imported from Europe may be able to benefit from at least some of these provisions.

Europe continues to have an outsized investment presence in the United States, as reflected by its FDI position, which is a more stable metric of foreign investment in the United States. In terms of foreign capital stock in the United States, Europe again leads the way. The region accounted for 64% of the total $5 trillion of foreign capital sunk in the United States as of 2021. Total European investment stock in the United States of $3.2 trillion was over three times the level of comparable investment from Asia.

The Netherlands was the largest European investor in the United States, based on FDI on a historic cost basis, with total FDI stock in the United States totaling $630 billion in 2021. The United Kingdom ranked second in Europe ($512 billion), followed by Germany ($403 billion)

Table 3. **European Foreign Direct Investment and Income in the United States** ($ Billions)

Sources: Bureau of Economic Analysis.
Data as of January 2023.

and Switzerland ($282 billion). Many firms from these countries are just as embedded in the U.S. economy as in their own home markets. Only Japan has a greater investment footprint in the U.S. than the major producers of Europe.

Whether Swiss pharmaceutical corporations, German auto manufacturers, or British services providers, European firms' commercial links to America have driven corporate sales and profits higher in recent decades. European firms in the United States earned record income in 2021 in a spectacular rebound from pandemic year 2020. Things leveled off somewhat in 2022, but European firms still earned roughly $151 billion in the United States. Through the first nine months of 2022, European affiliate income earned in the United States declined to $113 billion. Taking the long view, affiliate earning levels for most European firms are significantly higher today than they were at the start of the century. As European firms have built out their U.S. operations, the payoff has been rising affiliate earnings in one of the largest markets in the world.

Table 3 highlights this connection between European investment in the United States and European affiliate earnings. The two metrics are highly correlated – the greater the earnings, the greater the likelihood of more capital investment, and the more investment, the greater the upside for potential earnings and affiliate income. The bottom line is that Europe's investment stakes in the United States have paid handsome dividends over the years, notably since the Great Recession, given the growth differential between the United States and Europe. These higher earnings in the United States have also allowed these companies to succeed more back home in Europe – including both by expanding their operations and hiring more workers.

Europe's Stakes in America's 50 States

European firms can be found in all 50 states, and in all economic sectors – manufacturing and services alike. The employment impact of European firms in the United States is quite significant. Table 4 provides a snapshot of state employment supported directly by European affiliates across the United States. It is important to note that the chart represents only those jobs that have been directly created by European investment, and thus underestimates the true impact on U.S. jobs of America's commercial ties to Europe. Jobs tied to exports and imports of goods and services are not included, nor are many other jobs created indirectly through suppliers or distribution networks and related activities.

Table 4. Ranking of Top 20 States by Jobs Supported Directly By European Investment
(Thousands of employees)

U.S. State	2018	2019	2020
California	487.0	474.2	473
Texas	399.5	399.0	393
New York	364.6	360.3	361
Pennsylvania	233.5	237.7	245
Illinois	243.1	227.4	228
Florida	229.5	227.6	224
Michigan	206.1	201.6	205
North Carolina	198.4	198.6	203
New Jersey	205.0	202.9	199
Ohio	172.6	172.6	169
Massachusetts	168.3	167.9	165
Georgia	164.2	161.2	160
Virginia	154.4	156.1	149
Indiana	126.8	126.6	118
Tennessee	112.3	113.9	116
South Carolina	111.3	109.6	112
Minnesota	93.7	97.1	98
Missouri	90.1	87.1	95
Maryland	87.8	90.0	90
Connecticut	87.5	86.4	89

Source: Bureau of Economic Analysis.
Data as of January 2023.

In general, the presence of European affiliates in many states and communities across the United States has helped to improve America's job picture. The more European firms embed in local communities around the nation, the more they tend to generate jobs and income for U.S. workers, increase sales for local suppliers and businesses, expand revenues for local communities, and encourage capital investment and R&D expenditures for the United States.

European affiliate earnings in the U.S.
(2022 estimate)
$151 billion

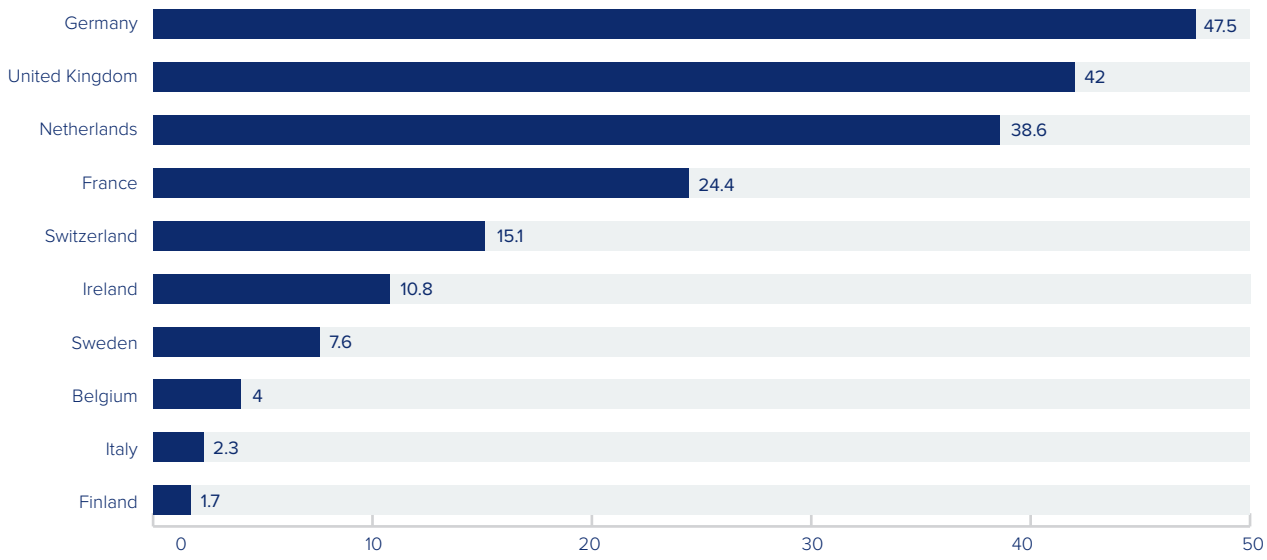
European firms can be found in all 50 states, and in all economic sectors – manufacturing and services alike.

Deep investment ties with Europe have also boosted U.S. trade. Table 5 illustrates the export potential of European affiliates operating in the United States. As a point of reference, in any given year, foreign affiliates based in the United States and exporting from there typically account for one-fourth of total U.S. merchandise exports. The bulk of these exports are intra-firm trade, or trade between the affiliate and its parent company. In 2020, the last year of available data, U.S. exports shipped by all majority-owned foreign affiliates totaled $347 billion, with European affiliates accounting for 57% of the total. German companies exported more than $47 billion in exports made in the U.S.A., while British and Dutch firms exported $42 billion and $38 billion, respectively.

Wholesale trade, transportation equipment, and chemical manufactures represented the largest categories of exports by affiliates to markets outside the United States. In the end, the more European affiliates export from the United States, the higher the number of jobs for U.S. workers and the greater the U.S. export figures.

Every U.S. state maintains cross-border ties with Europe, with various European countries serving as key export markets for many U.S. states, a dynamic that creates and generates growth in the United States. Table 6 ranks the top 20 state goods exporters to Europe in 2021, the last year of full-year state data. Texas ranked number one, followed by California, New York, and New Jersey. Overall, U.S. goods exports to Europe were up 16% in 2021; they rose again substantially by 27.3% in 2022.

Table 5. U.S. Exports of Goods Shipped by European Companies Operating in the United States ($Billions)



Source: Bureau of Economic Analysis.
Data for 2020.

Table 6. Ranking of Top 20 U.S. States Total Goods Exports to Europe, By Value

U.S. State	2021 ($Billions)	2000 ($Billions)	% Change from 2000	% Change from 2020
Texas	63.0	12.3	413	38
California	35.1	27.9	26	2
New York	29.1	15.3	90	29
New Jersey	16.0	2.8	473	29
Illinois	14.2	4.7	203	19
Louisiana	13.0	6.4	104	29
Pennsylvania	12.2	7.3	67	18
Massachusetts	11.8	13.1	-10	19
Utah	10.8	3.1	251	-2
Indiana	10.3	1.3	669	16
Georgia	9.9	3.3	201	-12
Florida	9.7	8.0	21	14
Washington	9.6	5.0	90	38
South Carolina	9.3	4.0	135	-10
Ohio	9.0	3.1	186	24
Kentucky	8.9	3.9	128	13
North Carolina	8.4	4.6	82	7
Tennessee	7.7	2.7	187	17
Michigan	6.9	5.0	37	-3
Connecticut	6.7	3.5	93	1
U.S. Total	**386.0**	**187.4**	**106**	**16**

Source: Foreign Trade Division, U.S. Census Bureau.
Data as of January 2023.

U.S. merchandise exports to Europe are still more than two and half times U.S. exports to China, as shown in Table 7. Forty-five of the fifty U.S. states exported more goods to Europe than China. New York's good exports to Europe were 8 times more than its goods exports to China. Texas exported three times more goods to Europe than to China. The largest Pacific coast state of California exported roughly twice as many goods to Europe as to China.

The presence of European affiliates in many states and communities across the United States has helped to improve America's job picture.

45/50
states export more goods to Europe than to China
(2021)

In addition, while these figures are significant, they actually underestimate Europe's importance as an export destination for U.S. states because they do not include U.S. state exports of services. This is a significant additional source of jobs and incomes for U.S. workers, with most U.S. jobs tied to services. Europe is by far the most important market in the world for U.S. services, and the United States consistently records a significant services trade surplus with Europe. Suffice it to say that if services exports were added to goods exports by state, the European market becomes even more important.

Appendix A highlights European-related jobs, trade, and investment for each of the 50 states.

Table 7. U.S. State Exports of Goods to Europe and China, 2021 ($Millions)

U.S. State	Europe	China
Alabama	6,166	3,153
Alaska	1,150	1,381
Arizona	5,048	1,492
Arkansas	1,245	263
California	35,056	16,636
Colorado	1,785	921
Connecticut	6,739	1,257
Delaware	1,046	556
Florida	9,668	1,473
Georgia	9,883	4,189
Hawaii	19	11
Idaho	346	153
Illinois	14,199	3,500
Indiana	10,315	3,237
Iowa	2,958	925
Kansas	2,039	1,124
Kentucky	8,869	2,376
Louisiana	13,034	12,399
Maine	591	103
Maryland	6,067	1,271
Massachusetts	11,750	3,516
Michigan	6,887	2,748
Minnesota	4,784	2,406
Mississippi	2,304	715
Missouri	2,755	700
Montana	293	109
Nebraska	933	696
Nevada	3,804	1,243
New Hampshire	2,489	396
New Jersey	16,000	4,142
New Mexico	363	1,467
New York	29,110	3,613
North Carolina	8,388	4,075
North Dakota	298	65
Ohio	8,984	3,748
Oklahoma	1,445	221
Oregon	3,001	10,626
Pennsylvania	12,222	3,254
Rhode Island	1,180	148
South Carolina	9,307	4,602
South Dakota	188	130
Tennessee	7,744	2,948
Texas	62,997	21,636
Utah	10,768	963
Vermont	445	285
Virginia	4,962	3,180
Washington	9,564	12,063
West Virginia	1,503	1,234
Wisconsin	4,851	1,798
Wyoming	45	48
Total United States	**385,965**	**151,442**

Source: U.S. Census Bureau, Foreign Trade Division. Data as of January 2023.

7

European Countries: U.S.-Related Jobs, Trade and Investment

Europe remains the most attractive region in the world for U.S. companies investing abroad.

Total U.S. FDI stock in Europe (2021)

$4 trillion

61.5%

of total U.S. global investment

Despite an array of pressures in 2022, the eurozone economy managed to grow faster than either the U.S. or Chinese economies. This year Europe continues to face Russia-induced energy shocks, ongoing war, inflationary concerns, and the backup in global interest rates. Many European economies have demonstrated surprising resilience in the face of these challenges. Nonetheless, the economic outlook is fluid and uncertain.

Europe's economic performance is important to the United States for the simple reason that on a global basis, no region of the world offers more opportunities in terms of market size and wealth, and access to skilled resources, than Europe. And outside the United States, no region has more sway on corporate America's bottom line than Europe. Europe remains the most attractive region in the world for U.S. companies investing abroad.

The latest investment figures underscore corporate America's enduring commitment to its long-standing transatlantic partner. Measured on a historic cost basis, the total stock of U.S. FDI in Europe was $4 trillion in 2021, or 61.5% of total U.S. investment abroad. This is almost four times the amount of comparable U.S. investment in the Asia-Pacific region ($957 billion).

According to the latest figures from the United Nations, while FDI inflows to both the United States and Europe were severely affected by the global recession of 2020, flows have since rebounded. Global FDI flows to Europe totaled just $81 billion in 2020, down from $404 billion in 2019. These sharp swings in global FDI to Europe were driven mainly by large divestments and negative intra-company loans in the Netherlands and Switzerland, and the general downdraft related to the pandemic. However, these drops were one-offs. Global FDI flows to Europe rebounded to a $219 billion in 2021, accounting for nearly 14% of total global inflows. Figures for 2022 are not available but we suspect FDI flows to Europe built off the gains of 2021.

This overall number, while impressive, does not tell us much about the reasons for such investment or the countries where U.S. companies focus their investments. As we have stated in previous surveys, official statistics blur some important distinctions when it comes to the nature of transatlantic investment flows. Recent research, however, helps us understand better two important phenomena: "round-tripping" and "phantom FDI".

Round-Tripping

Round-tripping investments go from an original investor, for instance in the United States, to an ultimate destination in a country such as Germany, but flow first from the United States to an intermediate country such as Luxembourg, and then from Luxembourg to Germany. Official statistics record this as a U.S.-Luxembourg flow or a Luxembourg-Germany flow. While Luxembourg may derive some economic benefit from that flow emanating originally from the United States, the ultimate beneficiary is in Germany. Applying this example to 2017, the year with the most recent data, official figures from the IMF indicate that FDI in Germany from the United States was around $90 billion, whereas research by economists at the IMF and University of Copenhagen that took account of these "round tripping" flows concluded that the stock of "real FDI" from the United States in Germany was actually almost $170 billion. Similarly, "real FDI" links from Germany to the United States are considerably higher than official statistics might indicate. All told, they estimated that "real FDI" bilateral links from Germany to the United States in that year topped $400 billion in 2017, whereas official statistics put that figure closer to $300 billion.

This phenomenon continues to apply to these and other important bilateral investment links, such as those between the U.S. and the UK or the U.S. and France. In these and other instances, "real FDI" links are likely to be higher than standard measurements indicate.

"Phantom" vs. "Real" FDI

The second important phenomenon is what economists call "phantom FDI," or investments that pass through special purpose entities that have no real business activities. To understand the nature of transatlantic investment links, it is important to be able to separate phantom FDI from FDI in the "real" economy. Damgaard, Elkjaer and Johannesen estimated that investment in countries such as Poland, Romania, Denmark, Austria and Spain, for instance, were mostly genuine FDI investments, while

investment in countries such as Luxembourg and the Netherlands were largely comprised of investments in corporate shells used to minimize the global tax bills of multinational enterprises. They estimated that most of the world's "phantom FDI" in 2017 was in a small group of well-known offshore centers: Luxembourg, the Netherlands, Hong Kong, British Virgin Islands, Bermuda, Singapore and the Cayman Islands.

Box 6.1 FDI Outflows to Europe Adjusted for Flows of Holding Companies

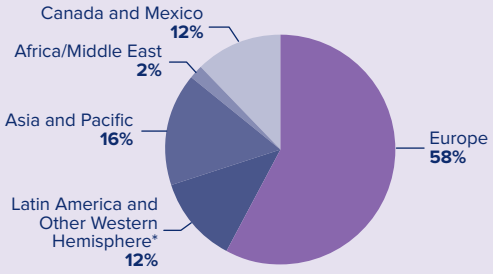
U.S. holding companies have played an important role in the rise of U.S.-Europe FDI over the past few decades. As of 2020, the last year of available data, nonbank holding companies accounted for $2.9 trillion, or about 47% of the global U.S. outward FDI position of approximately $6.2 trillion, and 54% of total U.S. FDI stock in Europe.

As the U.S. Bureau of Economic Analysis notes, "The growth in holding company affiliates reflects a variety of factors. Some holding-company affiliates are established primarily to coordinate management and administration activities – such as marketing, distribution, or financing – worldwide or in a particular geographic region. In addition, the presence of holding company affiliates in countries where the effective income tax rate faced by affiliates is relatively low suggests tax considerations may have also played a role in their growth. One consequence of the increasing use of holding companies has been a reduction in the degree to which the U.S. Direct Investment Abroad position (and related flow) estimates reflect the industries and countries in which the production of goods and services by foreign affiliates actually occurs".

Tables 1a and 1b, drawing on BEA data, reflect the significance of holding companies in the composition of U.S. FDI outflows. European markets accounted for roughly 58% of total U.S. FDI outflows between 2009 and 2020. However, when flows to nonbank holding companies are excluded from the data, the share of outflows to markets such as Europe and Other Western Hemisphere declines. In 2020, U.S. FDI flows to holding companies in Europe rebounded sharply to $62.8 billion. This represented over half of total U.S. FDI outflows to Europe. In prior years, FDI outflows to Europe were negative (-$189 billion in 2018 and -$87 billion in 2019), as U.S. companies repatriated a large amount of accumulated foreign earnings.

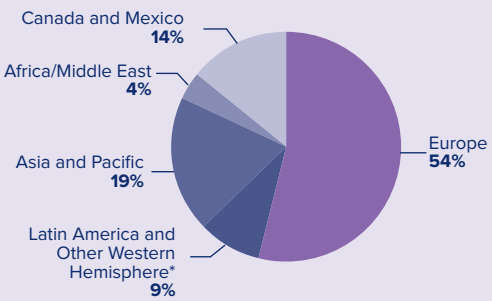
In the long run, when FDI related to holding companies is stripped from the numbers, the U.S. foreign direct investment position in Europe is not as large as typically reported by the BEA. Nonetheless, Europe remains the destination of choice among U.S. firms even after the figures are adjusted. Between 2009 and 2020, Europe still accounted for over half of total U.S. FDI outflows when flows from holding companies are removed from the aggregate. Europe's share was still more than double the share to Asia, underscoring the deep and integrated linkages between the United States and Europe.

Table 1a. Total U.S. FDI Outflows, 2009-2020
(% of Total)



**Excluding Mexico.*
Source: Bureau of Economic Analysis. Data as of January 2022.

Table 1b. U.S. FDI Outflows Excluding Flows to Nonbank Holding Companies, 2009-2020
(% of Total)



**Includes Central America (excluding Mexico) and Other Western Hemisphere.*
Source: Bureau of Economic Analysis. Data as of January 2022.

Of the top twenty global export platforms for U.S. multinationals in the world, nine are located in Europe, a trend that reflects Europe's intense cross-border trade and investment linkages and the strategic way U.S. firms leverage their European supply chains.

Since 2017, however, the role of offshore financial centers has gradually declined, while that of large economies, particularly the United States, has increased. One contributing factor is likely to have been the U.S. Tax Cuts and Jobs Act of 2018, which lowered incentives to keep profits in low-tax jurisdictions and led to a substantial U.S. repatriation of funds from foreign subsidiaries. Additionally, some flows to offshore financial centers are likely to have been blunted by sustained international efforts to reduce tax avoidance, like the OECD/G20 Base Erosion and Profit Shifting initiative, which has led 137 countries to reach agreement on a fair allocation of taxing rights and a global minimum effective tax at a uniform tax rate of 15%.

In the aggregate, and extrapolating forward, about 54% of America's total FDI position in Europe was allocated to non-bank holding companies in 2020, meaning that less than half of the $3.7 trillion was invested in "real economy" industries such as mining, manufacturing, wholesale trade, finance, and professional and information services (See Box 6.1). Excluding holding companies, total U.S. FDI stock in Europe in 2020 amounted to $1.7 trillion – a much smaller figure.

Table 2. **U.S. FDI Flows to Europe: The Long View** ($Millions, (-) inflows)

	1990-1999		2000-2009		2010-3Q2022	
Country	$ Aggregate Total	% of Total Europe	$ Aggregate Total	% of Total Europe	$ Aggregate Total	% of Total Europe
Europe	465,337		1,149,810		1,889,346	
Austria	2,908	0.6	501	0.0	8,790	0.5
Belgium	12,028	2.6	40,120	3.5	28,757	1.5
Czech Republic	155	0.0	1,941	0.2	5,400	0.3
Denmark	2,798	0.6	5,782	0.5	11,730	0.6
Finland	1,485	0.3	1,598	0.1	3,982	0.2
France	29,063	6.2	42,963	3.7	28,626	1.5
Germany	31,817	6.8	60,363	5.2	76,678	4.1
Greece	413	0.1	943	0.1	369	0.0
Hungary	2,929	0.6	1,376	0.1	838	0.0
Ireland	21,369	4.6	115,085	10.0	368,284	19.5
Italy	13,825	3.0	26,462	2.3	20,459	1.1
Luxembourg	15,912	3.4	126,989	11.0	334,043	17.7
Netherlands	70,770	15.2	295,889	25.7	361,771	19.1
Norway	4,198	0.9	4,997	0.4	17,480	0.9
Poland	2,681	0.6	4,699	0.4	4,613	0.2
Portugal	1,993	0.4	2,212	0.2	876	0.0
Russia	1,555	0.3	11,289	1.0	-3,756	-0.2
Spain	11,745	2.5	28,371	2.5	15,552	0.8
Sweden	10,783	2.3	16,974	1.5	7,702	0.4
Switzerland	32,485	7.0	97,869	8.5	130,258	6.9
Turkey	1,741	0.4	5,994	0.5	9,706	0.5
United Kingdom	175,219	37.7	237,906	20.7	444,751	23.5
Other	17,465	2.6	19,487	1.4	2,927	0.2

Source: Bureau of Economic Analysis.
Data as of January 2023.

These figures illustrate the extremely volatile nature of U.S. FDI annual outflows. Table 2 provides a more long-term view of U.S.-European investment ties. As shown in the chart, the share of U.S. FDI in both Germany and France declined sharply this past decade, with France accounting for just 1.5% of U.S. FDI flows to Europe from 2010 through the third quarter of 2022. Germany's share is slightly higher, 4.1%, but still off the levels of previous decades. However, as mentioned, these figures need to be interpreted very carefully, since a good deal of original investment from the United States makes its way to France and Germany via other countries, and analyses that include "round-tripping" estimates conclude that U.S. FDI that eventually ends up in France and Germany remains robust.

Ireland has become a favored destination for FDI among U.S. companies looking to take advantage of the country's flexible and skilled English-speaking labor force, low corporate tax rates, strong economic growth, membership in the European Union, and pro-business policies. Even when adjusting U.S. FDI figures to take account of flows of U.S. holding companies, Ireland still ranks as one of the most attractive places in the world for U.S. businesses.

Just as U.S. firms leverage different states across America, with certain activities sprinkled around the Northeast, Midwest, South and West, U.S. firms deploy the same strategies across Europe, leveraging the specific attributes of each country. Economic activity across the EU is just as distinct

Table 3. Global Export Platforms for U.S. Multinationals (U.S. Affiliate Sales From Abroad to Other Destinations*) ($Millions)

	1982		1990		2000		2020	
Rank	Country	Value	Country	Value	Country	Value	Country	Value
1	United Kingdom	33,500	United Kingdom	51,350	United Kingdom	94,712	Ireland	404,308
2	Switzerland	27,712	Canada	46,933	Canada	94,296	Singapore	311,938
3	Canada	25,169	Germany	41,853	Germany	69,522	Switzerland	253,349
4	Germany	19,117	Switzerland	38,937	Netherlands	67,852	United Kingdom	188,159
5	Netherlands	15,224	Netherlands	33,285	Singapore	56,961	Netherlands	142,288
6	Belgium	11,924	France	24,782	Switzerland	56,562	Canada	122,733
7	Singapore	11,579	Belgium	21,359	Ireland	51,139	Belgium	112,702
8	France	11,255	Singapore	15,074	Mexico	37,407	Germany	109,268
9	Indonesia	8,289	Hong Kong	9,951	France	35,797	Hong Kong	108,966
10	Hong Kong	4,474	Italy	9,562	Belgium	32,010	Mexico	94,095
11	Italy	3,993	Ireland	9,469	Hong Kong	22,470	China	81,427
12	Australia	3,710	Spain	7,179	Malaysia	16,013	France	46,868
13	Ireland	2,842	Japan	7,066	Sweden	15,736	India	37,767
14	United Arab Emirates	2,610	Australia	6,336	Italy	14,370	Brazil	35,452
15	Brazil	2,325	Mexico	5,869	Spain	12,928	Australia	28,399
16	Japan	2,248	Indonesia	5,431	Japan	11,845	Spain	26,806
17	Malaysia	2,046	Brazil	3,803	Australia	9,370	Malaysia	23,906
18	Panama	1,662	Norway	3,565	Brazil	8,987	Italy	23,811
19	Spain	1,635	Malaysia	3,559	China	7,831	Thailand	21,118
20	Mexico	1,158	Nigeria	2,641	Norway	6,238	Japan	19,533
	All Country Total	252,274	All Country Total	398,873	All Country Total	857,907	All Country Total	2,556,712

Source: Bureau of Economic Analysis.
Data as of January 2023.
**Destination = affiliate sales to third markets and sales to U.S. for majority-owned foreign affiliates.*

Europe's share of U.S. FDI outflows

64.3%

and differentiated by country. Different growth rates, differing levels of consumption, varying degrees of wealth, labor force participation rates, financial market development, innovation capabilities, corporate tax rates – all of these factors, and more, determine where and when U.S. firms invest in Europe.

Table 3 underscores this point. The figures show U.S. affiliate sales from a given country to other destinations, or the exports of affiliates per country. Of the top twenty global export platforms for U.S. multinationals in the world, nine are located in Europe, a trend that reflects Europe's intense cross-border trade and investment linkages and the strategic way U.S. firms leverage their European supply chains. For U.S. companies, Ireland is the number one platform in the world from which their affiliates can reach foreign customers. Switzerland, ranked third, remains a key export platform and pan-regional distribution hub for U.S. firms.

On a standalone basis, U.S. affiliates' exports from Ireland are greater than the total export volumes of most countries. Such is the export-intensity of U.S. affiliates in Ireland and the strategic importance of Ireland to the corporate success of U.S. firms operating in Europe and around the world. Moreover, the UK's exit from the EU may further solidify Ireland's spot as the number one location for U.S. affiliate exports. When exporting from the UK, new barriers to trade, including regulatory checks and rules of origin requirements, in addition to stricter immigration rules, could cause some companies to relocate operations to Ireland in search of easier access to the EU market.

The UK still plays an important role for U.S. companies as an export platform to the rest of Europe. However, the introduction of the euro, the Single Market, EU enlargement and now Brexit have enticed more U.S. firms to invest directly in EU member states. The extension of EU production networks and commercial infrastructure throughout a larger pan-continental Single Market has shifted the center of gravity in Europe eastward within the EU, with Brussels playing an important role in shaping economic policy.

The cyclical challenge before Europe is substantial: Russia's war and energy shocks will exert considerable pressure on many economies. Consumers and businesses have been hammered by the spike in energy costs, although diversified supplies and public support mechanisms, along with falling prices, have helped alleviate some of the burden.

Why Europe Matters

The cyclical challenge before Europe is substantial: Russia's war and energy shocks will exert considerable pressure on many economies. Consumers and businesses have been hammered by the spike in energy costs, although diversified supplies and public support mechanisms, along with falling prices, have helped alleviate some of the burden.

That said, it is important to see the forest from the trees, and to recognize that, first, Europe on a standalone basis remains one of the largest and wealthiest economic entities in the world and, second, the region remains a critical cog in the corporate success of U.S. firms.

Europe is home to more than 500 million people across the EU, the UK, Norway, Switzerland, Iceland and a host of eastern countries. This cohort accounted for roughly 23% of world output in 2021 – slightly lower than the U.S. share of 24%, but greater than that of China's (18%). On a purchasing power parity basis, Europe's share was greater than that of the United States but less than that of China in 2021.

Given its size, Europe remains a key pillar of the global economy and critical component to the corporate success of U.S. firms. As Table 4 highlights, Europe attracts more than half of U.S. aggregate FDI outflows. The region's share of total U.S. FDI during the last decade was 57.3%, which is up from the first decade of this century as well as from the level of the 1990s. We are early in this decade, but thus far, Europe's share of U.S. FDI outflows has actually increased to 64.3% of the total. Part of this dynamic reflects weakening U.S. investment flows to China.

Even after adjusting for FDI flows related to holding companies, Europe remains the favored destination of U.S. firms. This runs counter to the fashionable but false narrative that corporate America prefers low-cost nations in Asia, Latin America, and Africa to developed markets like Europe.

Table 4. Cumulative U.S. FDI Outflows ($Millions)

Decade	All Countries	Europe	Europe as a % of World
1950-1959	20,363	3,997	19.6
1960-1969	40,634	16,220	39.9
1970-1979	122,721	57,937	47.2
1980-1989	171,880	94,743	55.1
1990-1999	869,489	465,337	53.5
2000-2009	2,056,007	1,149,810	55.9
2010-2019	2,404,739	1,378,601	57.3
2020 - Q3 2022	828,381	532,642	64.3

Source: Bureau of Economic Analysis.
Data as of January 2022.

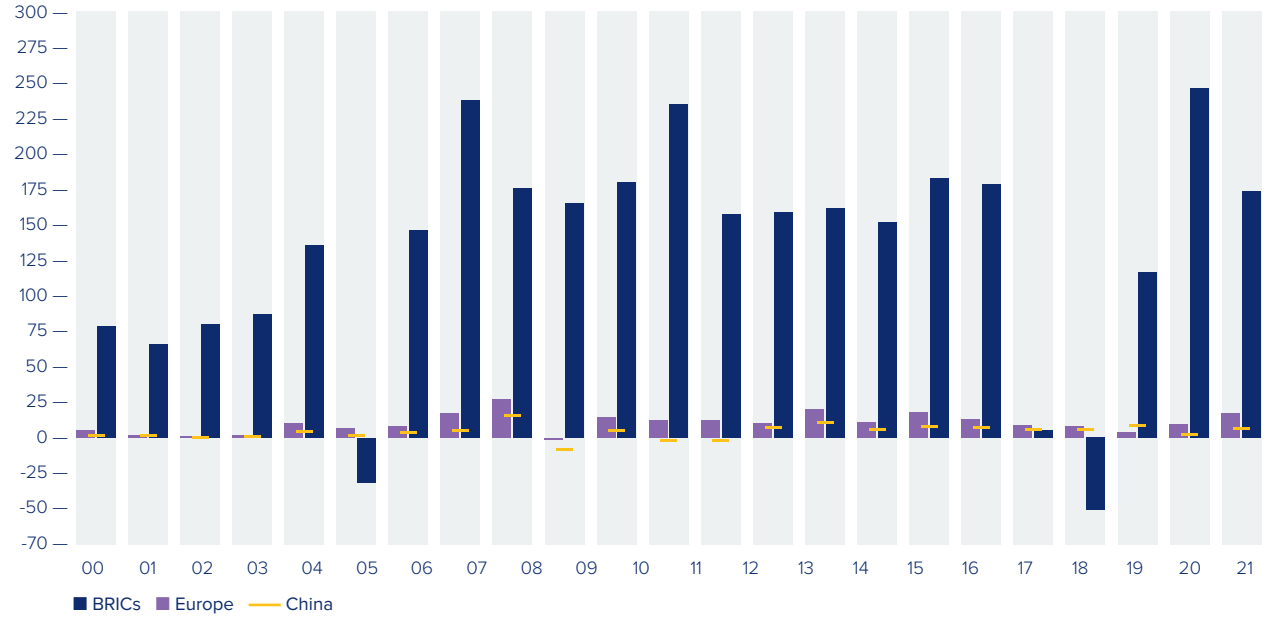
Investing in emerging markets such as China, India, and Brazil remains difficult, with indigenous barriers to growth (poor infrastructure, dearth of human capital, corruption, etc.) as well as policy headwinds (foreign exchange controls, tax preferences favoring local firms) reducing the overall attractiveness of these markets to multinationals. As shown in Table 5, there has been a wide divergence between U.S. FDI to the BRICs (Brazil, Russia, India, China) and U.S.

Europe remains the favored destination of U.S. firms. This runs counter to the fashionable but false narrative that corporate America prefers low-cost nations in Asia, Latin America, and Africa to developed markets like Europe.

FDI to Europe. After a drop in flows to Europe in 2019 due to U.S. domestic tax reform, investment in Europe rebounded in 2020 and continued to gather momentum in 2021 and 2022. In the first three quarters of 2022, U.S. FDI outflows to Europe totaled roughly $172 billion, 29 times more than U.S. FDI outflows to China of $6.1 billion and 10 times more than U.S. FDI outflows to in flows to the BRICs of $16.5 billion.

Gaining access to wealthy consumers is among the primary reasons why U.S. firms invest overseas, which explains the continued attractiveness of affluent Europe to American companies. Fourteen of the twenty-five wealthiest nations in the world are European. GDP per capita in the EU ($38,234 in 2020) is significantly higher than that in China ($12,556) or India ($2,277).

Table 5. Foreign Direct Investment Outflows to the BRICs vs. Europe ($Billions)



**Europe does not include flows to Russia.*
Source: Bureau of Economic Analysis.
Data as of January 2023.

Wealth drives consumption, with the EU+UK accounting for roughly 21% of global personal consumption expenditures in 2021. That's a lower share than that of the U.S. (30%) but well above that of China (12%), India (3.4%) and the BRICs combined (18.6%). Since 2000, personal consumption expenditures in the EU have almost doubled to roughly $9.6 trillion, representing an increasing market opportunity for large global corporations.

Wealth in Europe is also correlated with a highly skilled and productive workforce, advanced innovation capabilities, and a world-class R&D infrastructure – underpinning the attractiveness of the EU to corporate America. The EU's labor force is not only more than twenty percent larger than America's; its labor force participation rate is more than ten percentage points higher (74.3%) than it is in the U.S. (62.4%). Finally, when it comes to skilled labor, Europe again leads the United States. To this point, in 2018, the last year of available data, the number of science and engineering graduates in the EU+UK totaled roughly 1 million, versus 760,000 in the U.S., according to the National Science Foundation. Since the U.S. economy is short of technology and scientific talent, accessing Europe's tech talent pool is critical to the long-term success of many American firms.

Drivers of foreign investment into Europe

Access to a large market

Purchasing power of consumers

Skilled and productive workforce

Advanced innovation capabilities

World-class R&D infrastructure

Business-friendly policies

Respect for the rule of law

Strong financial markets

Business-friendly policies surrounding property rights, the ability to obtain credit, employment regulations, starting a business and cross-border trade have been a major draw for foreign investors over the years. According to the International Institute for Management Development (IMD) latest World Competitiveness Rankings for 2022, fourteen European economies ranked in the top twenty-five. Among the top ten, Denmark was ranked #1, followed by Switzerland (2), Sweden (4), the Netherlands (6), Finland (8) and Norway (9). Other factors, such as shared values, respect for the rule of law, credible institutions, advanced infrastructure, and strong financial markets continue to set Europe apart when it comes to U.S. business investment.

Finally, Europe continues to be a world leader when it comes to innovation and knowledge-based activities. According to the 2022 Global Innovation Index, eight European economies rank among the top 15 most innovative countries in the world (Table 6). The index takes into account a wide range of factors such as institutions, education quality, research & development, information & communication technologies (ICT) infrastructure, and more.

A related measure of knowledge-based capabilities is science & technology (S&T) intensity – or the sum of the patent and scientific publication shares divided by the population. By this measure, many European and U.S. regions have more scientific output per capita than their Asian counterparts. In fact, of the top 15 science & technology clusters, ranked by S&T intensity, 7 are located in Europe, 6 in the United States, and only 2 are in Asia (Table 6).

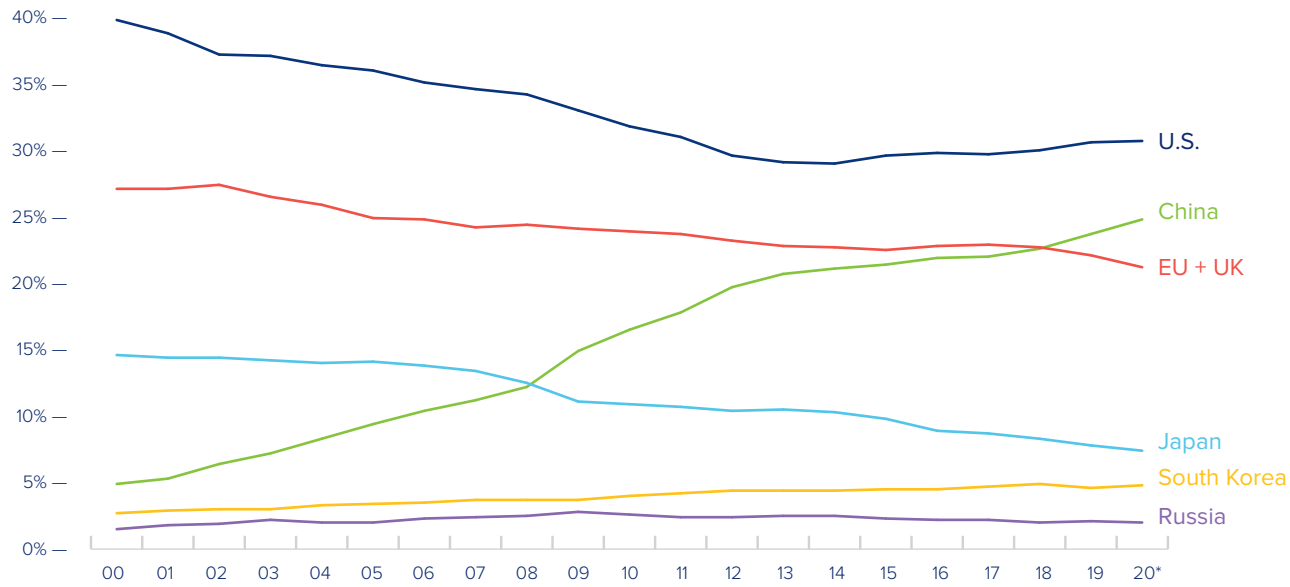
Since R&D expenditures are a key driver of value-added growth, it is interesting to note that EU- and UK-based organizations accounted for slightly more than one-fifth of total global R&D in 2020 in purchasing-power parity terms. That lagged the share of the United States and China but exceeded the share of Japan and South Korea. Over the past two decades, China has steadily advanced its R&D capabilities, and is projected to overtake the United States as the top R&D spender in the world (Table 7).

Table 6. **Global Innovation Index** (2022)

Overall Global Innovation Index		Science and Technology (S&T) Intensity		
Rank	Country	Rank	S&T Cluster	Country
1	Switzerland	1	Cambridge	UK
2	United States	2	Eindhoven	Belgium/Neth.
3	Sweden	3	Daejeon	Korea
4	United Kingdom	4	San Jose-San Francisco, CA	U.S.
5	Netherlands	5	Oxford	UK
6	South Korea	6	Boston-Cambridge, MA	U.S.
7	Singapore	7	Ann Arbor, MI	U.S.
8	Germany	8	San Diego, CA	U.S.
9	Finland	9	Seattle, WA	U.S.
10	Denmark	10	Lund-Malmö	Sweden
11	China	11	Lausanne	Switz./France
12	France	12	Raleigh, NC	U.S.
13	Japan	13	Munich	Germany
14	Hong Kong, China	14	Kazawa	Japan
15	Canada	15	Stockholm	Sweden

Source: Cornell University, INSEAD, and the World Intellectual Property Organization, Global Innovation Index 2022.
Data as of 2022.

Table 7. **Global R&D Expenditures and the Rise of China** (% of Total)



R&D share calculated in terms of current purchasing-power parity dollars. Global R&D is a sum of the OECD countries plus Argentina, China, Russia, Singapore, South Africa, Chinese Taipei and Romania.
**2020 authors' estimate for the following countries: Argentina, Singapore, South Africa & U.K.*
Source: OECD.
Data as of January 2023.

Add it all up and Europe – large, wealthy, competitive, and well-endowed with a large pool of skilled labor – remains a formidable economic entity with a great deal of upside.

Number of researchers hosted
(2019)

2.3 million
EU + Iceland + Norway + UK + Switzerland

2.1 million
China

1.6 million
U.S.

Europe remains a leader in a number of cutting-edge industries, including life sciences, agriculture and food production, automotives, nanotechnology, energy, and information and communications. Innovation requires talent, and on this basis, Europe is holding its own relative to other parts of the world. Europe is the world leader in terms of full-time equivalent research staff. Of the world's total pool of research personnel, the EU plus the UK, Switzerland, Norway and Iceland housed an estimated 2.3 million researchers in 2019, versus 1.6 million in the United States and 2.1 million in China, according to OECD estimates.

Finally, Europe is home to one of the most educated workforces in the world. In countries such as Ireland, Switzerland, Lithuania, Luxembourg, Belgium and the Netherlands, the share of the working age population with a bachelor's degree or higher exceeds 40%. The comparable figure for the U.S. is 39%. While U.S. universities remain a top destination for foreign students, the UK, Germany and France are also notable attractions. In the end, Europe remains among the most competitive regions in the world in terms of science and technology capabilities. The U.S. National Science Board has explicitly recognized EU research performance as strong and marked by pronounced intra-EU collaboration.

The Bottom Line

These are very challenging times for Europe. The near-term economic outlook remains fraught with risks and uncertainty as the continent struggles with war and its consequences. Slower growth and/or a recession in Europe is a significant risk to U.S. firms. However, an even greater risk to corporate America is being absent from the continent. In an age of scarce workers, resources, and markets, Europe has never been more important to American businesses.

Add it all up and Europe – large, wealthy, competitive, and well-endowed with a large pool of skilled labor – remains a formidable economic entity with a great deal of upside. Past and future, America's transatlantic partnership with Europe continues to yield significant dividends.

Appendix A

European Commerce and the 50 U.S. States:
A State-by-State Comparison

Alabama and Europe

Jobs

57,300

Since 2012: +11,000 (+23.8%)

European companies account for

49%

of foreign affiliate jobs

Employment within Alabama, 2020

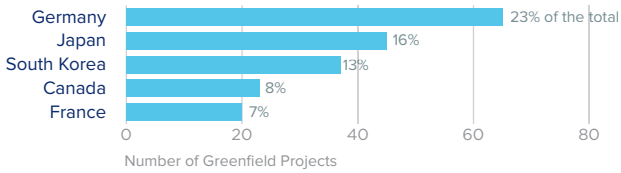
Country	Employment
Japan	21,000
Germany	16,500
Canada	15,400
United Kingdom	11,900
France	9,000

On a country basis, German companies operating in Alabama represented 14% of total foreign affiliate employment in Alabama, with German multinationals supporting approximately 5,300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



282

Greenfield Projects (July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

Alabama Goods Exports to Europe, 2021

$6.2 bn

68% of total exports from Alabama to Europe were transportation equipment, reflecting the state's linkages with European auto manufacturers.

Alabama Goods Imports from Europe, 2021

$7.7 bn

Transportation equipment and machinery manufactures were the top product imports from Europe.

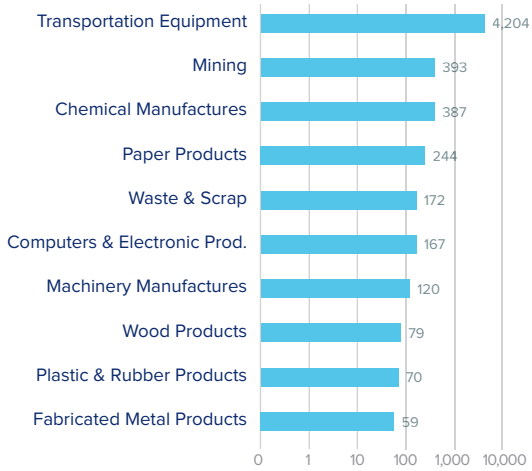
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	3,707
United Kingdom	415
Belgium	415
Russia	269
France	251

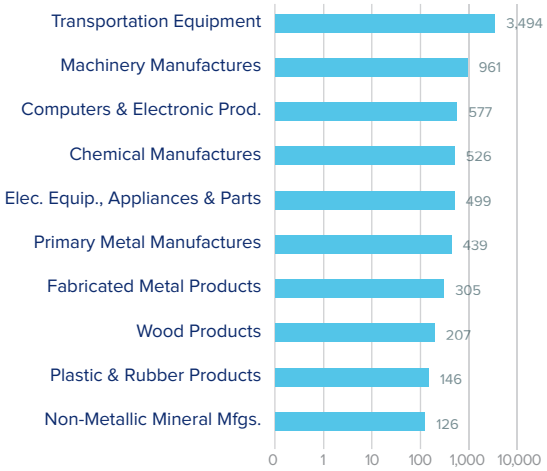
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	3,997
France	661
United Kingdom	656
Italy	289
Russia	228

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Alaska and Europe

Jobs

4,400

Since 2012: -2,300
(-34.3%)

European companies account for

32%

of foreign affiliate jobs

Employment within Alaska, 2019

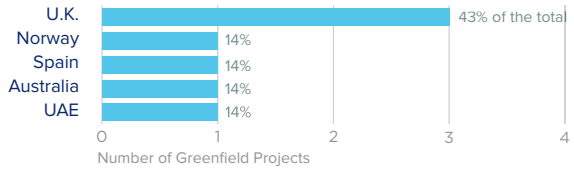
Country	Employment
Canada	5,600
Japan	2,400
United Kingdom	2,300
France	800
Switzerland	300

On a country basis, U.K. companies operating in Alaska represented 17% of total foreign affiliate employment in Alaska, with U.K. multinationals supporting approximately 2,400 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects
(July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

Alaska Goods Exports to Europe, 2021

$1.1 bn

The bulk of the state's exports consist of primary commodities.

Alaska Goods Imports from Europe, 2021

$391.8 mn

Imports of transportation equipment from Europe rose from $131 million in 2020 to $157 million in 2021.

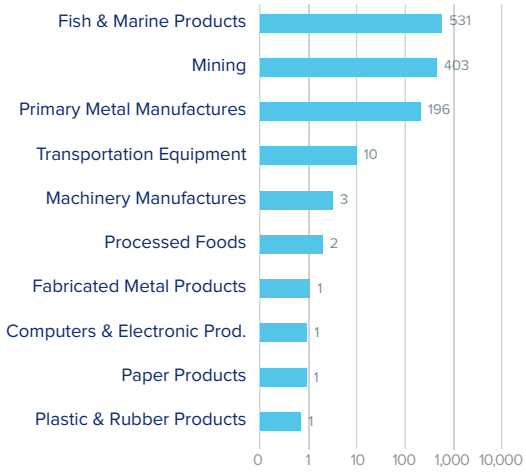
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	230
Netherlands	209
Switzerland	198
Belgium	109
Spain	105

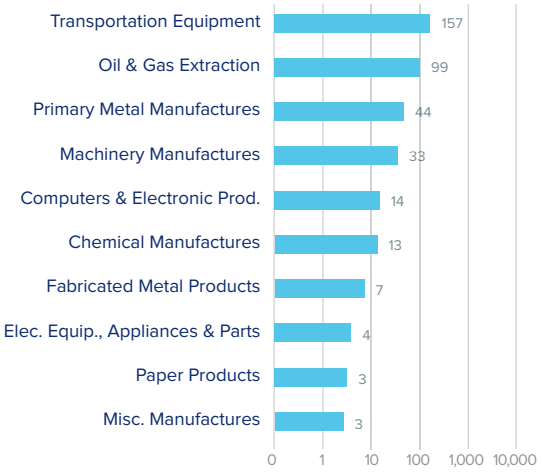
Top European Import Markets, 2021

Country	Imports ($ millions)
Russia	155
France	120
Germany	44
Italy	22
United Kingdom	15

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Arizona and Europe

Jobs

72,800

Since 2012: +22,400 (+44.4%)

European companies account for **55%** of foreign affiliate jobs

Employment within Arizona, 2020

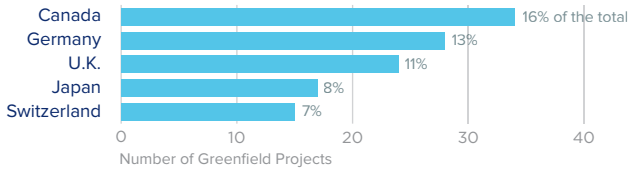
Country	Employment
Canada	21,700
United Kingdom	21,100
Japan	12,000
Germany	11,000
France	10,400

On a country basis, U.K. companies operating in Arizona represented 16% of total foreign affiliate employment in Arizona, with U.K. multinationals supporting approximately 7,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

Arizona Goods Exports to Europe, 2021

$5.0 bn

About two thirds of the state's exports to Europe consist of computers & electronic products and transportation equipment.

Arizona Goods Imports from Europe, 2021

$5.2 bn

Arizona's largest merchandise imports from Europe were computers & electronic products and transportation equipment, which combined represent almost half of the state's total imports from Europe.

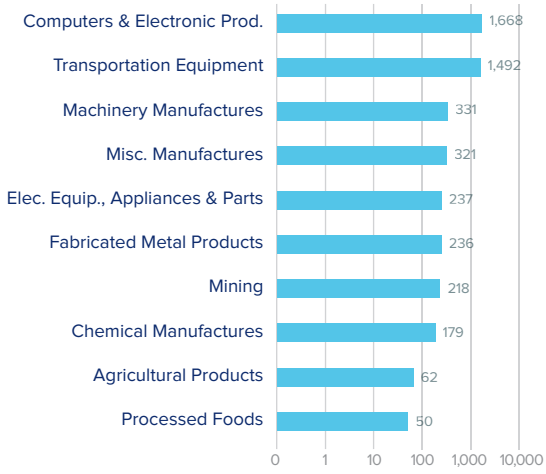
Top European Export Markets, 2021

Country	Exports ($ millions)
Ireland	890
Netherlands	805
United Kingdom	582
Germany	555
France	470

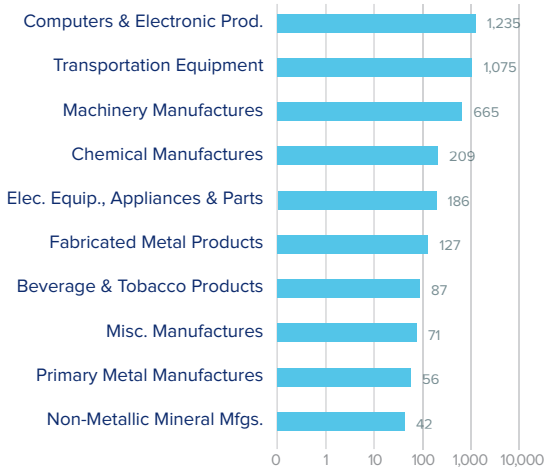
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	918
United Kingdom	862
France	756
Italy	550
Spain	389

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Arkansas and Europe

Jobs

29,600

Since 2012: +1,200 (+4.2%)

European companies account for

61%

of foreign affiliate jobs

Employment within Arkansas, 2020

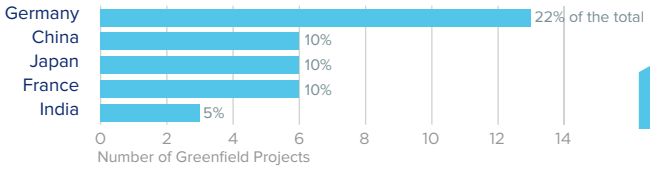
Country	Employment
United Kingdom	8,100
France	5,800
Japan	5,000
Switzerland	4,800
Canada	4,700

On a country basis, U.K. companies operating in Arkansas represented 17% of total foreign affiliate employment in Arkansas, with U.K. multinationals supporting approximately 3,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Arkansas Goods Exports to Europe, 2021

$1.2 bn

Transportation equipment made up 52% of exports to Europe in 2021.

Arkansas Goods Imports from Europe, 2021

$2.0 bn

Transportation equipment is the top imported product from Europe, representing 49% of total imports.

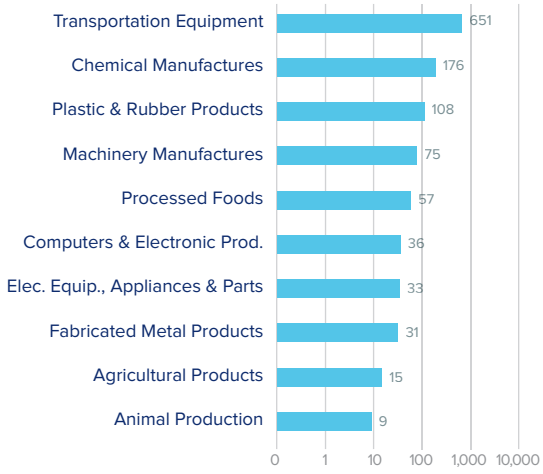
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	362
France	218
Netherlands	133
Germany	129
Belgium	80

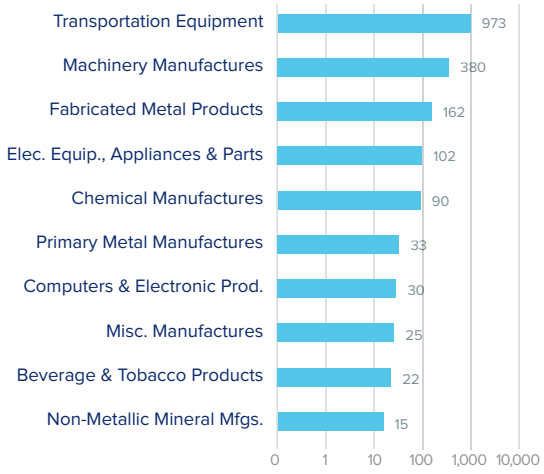
Top European Import Markets, 2021

Country	Imports ($ millions)
France	807
Germany	328
Italy	189
United Kingdom	151
Turkey	64

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

California and Europe

Jobs

473,800

Since 2012: +98,800 (+26.3%)

European companies account for **57%** of foreign affiliate jobs

Employment within California, 2020

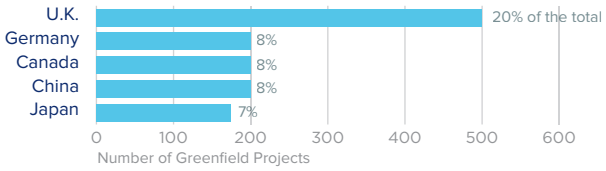
Country	Employment
United Kingdom	127,600
Japan	110,300
Germany	89,600
France	76,000
Canada	75,900

On a country basis, U.K. companies operating in California represented 15% of total foreign affiliate employment in California, with U.K. multinationals supporting approximately 36,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



2,502

Greenfield Projects (July 2011 - June 2021)

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Trade

California Goods Exports to Europe, 2021

$35.1 bn

22% of California's exports to Europe in 2021 consisted of high-tech goods (computers & electronic products).

California Goods Imports from Europe, 2021

$45.7 bn

Transportation equipment was the top product import, representing 23% of the state's total imports from Europe.

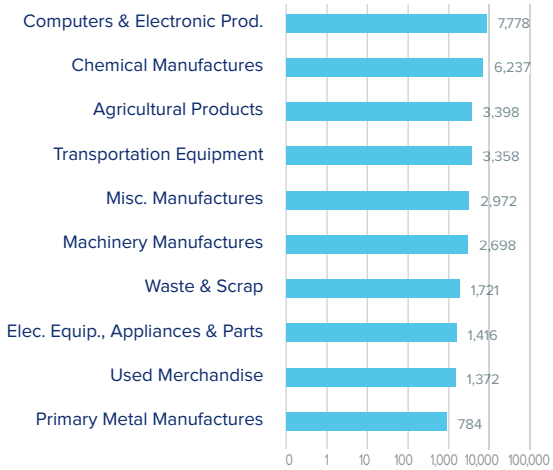
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	7,598
Netherlands	6,104
United Kingdom	4,346
Belgium	3,709
France	2,196

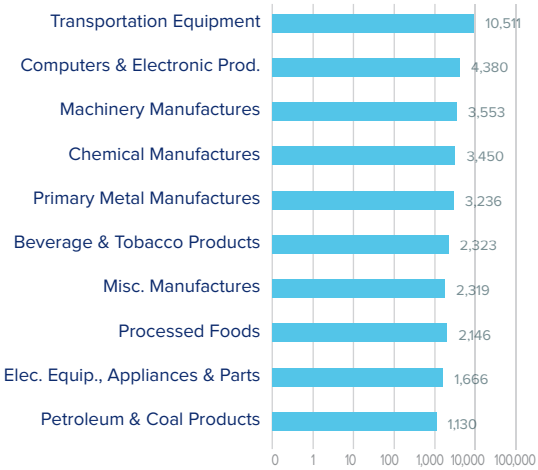
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	11,893
Italy	4,729
France	4,063
United Kingdom	3,909
Switzerland	3,646

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Colorado and Europe

Jobs

71,300

Since 2012: +21,500 (+43.2%)

European companies account for **58%** of foreign affiliate jobs

Employment within Colorado, 2020

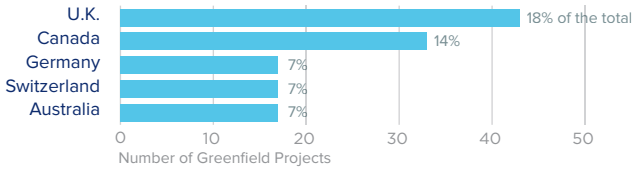
Country	Employment
Canada	20,700
United Kingdom	18,700
Japan	9,200
France	9,200
Germany	8,700

On a country basis, U.K. companies operating in Colorado represented 15% of total foreign affiliate employment in Colorado, with U.K. multinationals supporting approximately 6,000 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Colorado Goods Exports to Europe, 2021

$1.8 bn

About 22% of the state's exports to Europe consisted of high-tech goods (computers & electronic products) in 2021.

Colorado Goods Imports from Europe, 2021

$3.1 bn

Colorado's largest imports from Europe was machinery, followed by transportation equipment.

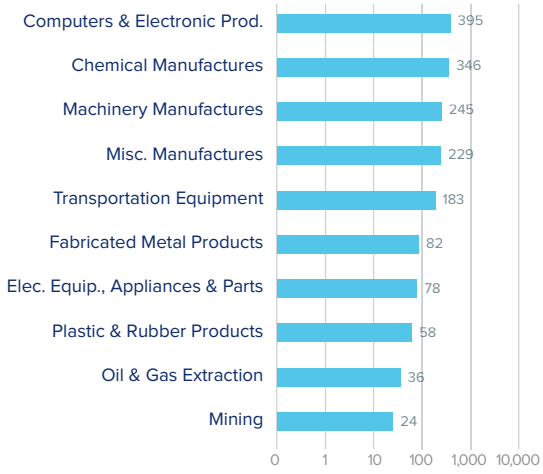
Top European Export Markets, 2021

Country	Exports ($ millions)
Switzerland	296
Germany	289
Netherlands	246
United Kingdom	226
France	181

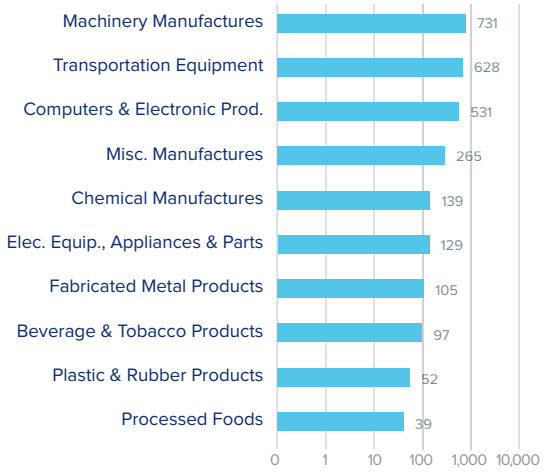
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	717
Germany	621
France	259
Italy	255
United Kingdom	195

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Connecticut and Europe

Jobs

88,500

Since 2012: +4,400 (+5.2%)

European companies account for

78%

of foreign affiliate jobs

Employment within Connecticut, 2020

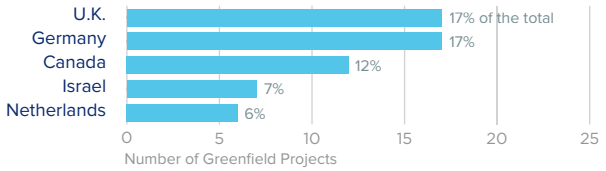
Country	Employment
United Kingdom	22,200
Netherlands	18,200
Germany	13,900
Japan	7,200
Switzerland	7,100

On a country basis, U.K. companies operating in Connecticut represented 20% of total foreign affiliate employment in Connecticut, with U.K. multinationals supporting approximately 2,800 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Connecticut Goods Exports to Europe, 2021

$6.7 bn

Exports are heavily skewed towards transportation equipment, which represent almost 50% of the state's total exports to Europe.

Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	2,333
United Kingdom	1,022
Netherlands	974
France	724
Turkey	318

Connecticut Goods Imports from Europe, 2021

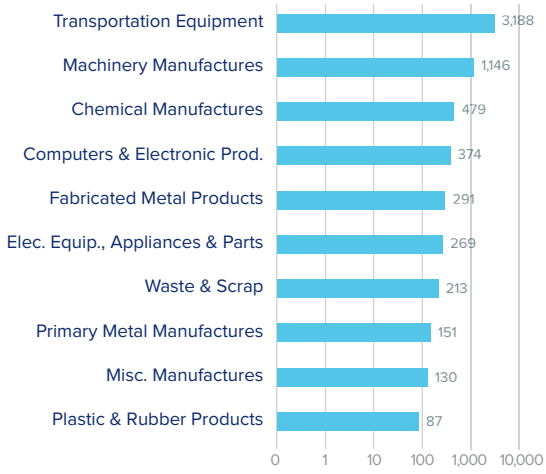
$7.4 bn

Machinery along petroleum & coal products were Connecticut's main import from Europe, representing 17% and 16% of the state's total merchandise imports from Europe, respectively

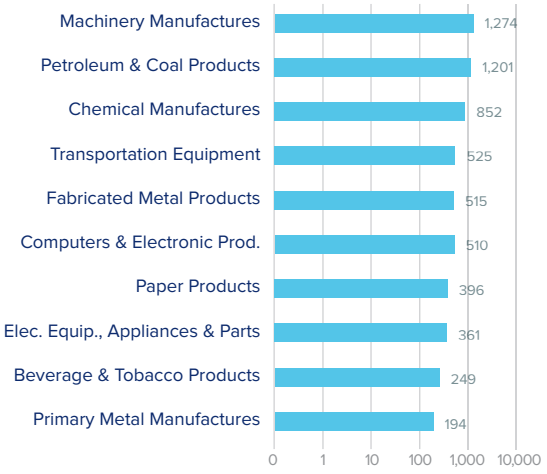
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	1,357
Netherlands	1,122
United Kingdom	914
France	625
Italy	516

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Delaware and Europe

Jobs

19,700

Since 2012: -600
(-3.0%)

European companies account for
79%
of foreign affiliate jobs

Employment within Delaware, 2020

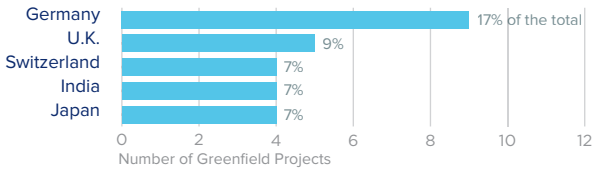
Country	Employment
United Kingdom	8,900
Netherlands	3,750
Germany	3,300
Canada	1,900
France	1,600

On a country basis, U.K. companies operating in Delaware represented 36% of total foreign affiliate employment in Delaware, with U.K. multinationals supporting approximately 600 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects
(July 2011 - June 2021)

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Trade

Delaware Goods Exports to Europe, 2021

$1.0 bn

Chemicals are Delaware's primary export to Europe, representing 30% of the state's total exports. That share is down from 50% in 2019, representing a diversification of state exports.

Delaware Goods Imports from Europe, 2021

$5.9 bn

Chemicals are also Delaware's top import, also accounting for 64% of the state's total imports from Europe.

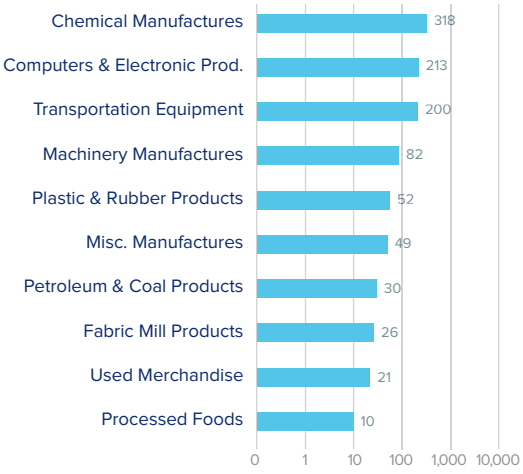
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	434
Belgium	171
United Kingdom	102
Netherlands	97
Switzerland	30

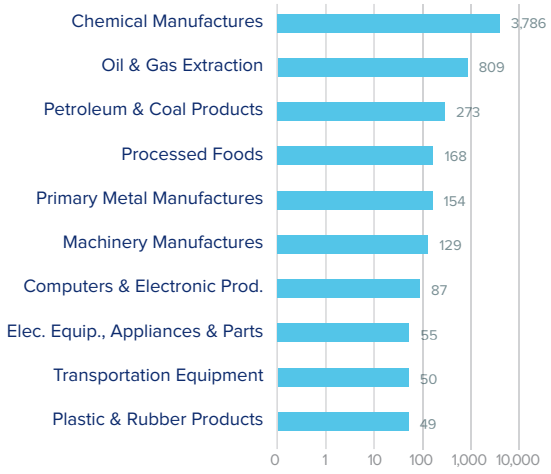
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	2,456
Russia	800
Belgium	656
France	451
Kazakhstan	311

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Washington, District of Columbia (D.C.) and Europe

Jobs

17,700

Since 2012: -1,700 (-8.8%)

European companies account for **79%** of foreign affiliate jobs

Employment within D.C., 2020

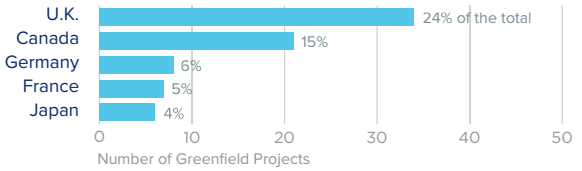
Country	Employment
United Kingdom	8,000
Germany	2,000
Canada	1,900
France	1,900
Switzerland	1,700

On a country basis, U.K. companies operating in Washington D.C. represented 36% of total foreign affiliate employment in DC, with U.K. multinationals supporting approximately 1,700 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Washington, D.C. Goods Exports to Europe, 2019

$903.2 mn

Transportation Equipment accounts for 49% of Washington, D.C.'s total exports to Europe.

Washington, D.C. Goods Imports from Europe, 2019

$256.8 mn

Washington D.C.'s top imports from Europe are computers & electronic products, machinery and beverage & tobacco products.

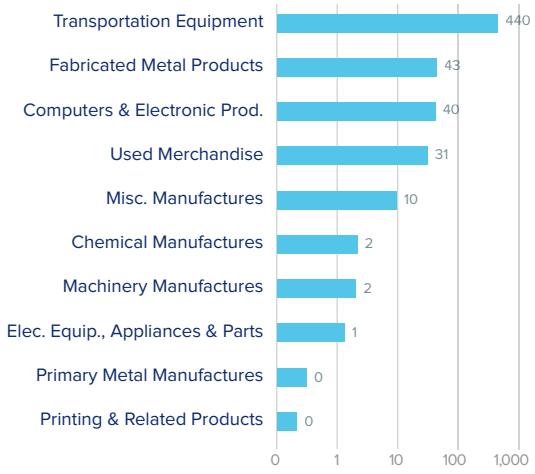
Top European Export Markets, 2019

Country	Exports ($ millions)
United Kingdom	608
France	83
Poland	60
Sweden	42
Norway	27

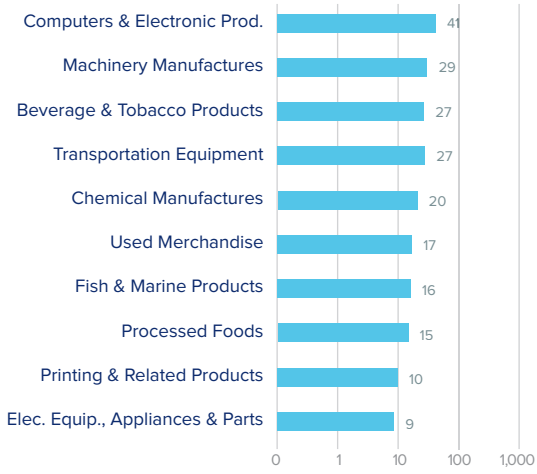
Top European Import Markets, 2019

Country	Imports ($ millions)
Germany	88
France	28
Turkey	27
United Kingdom	21
Switzerland	20

Top Ten Exports to Europe, 2019 ($ millions)



Top Ten Imports from Europe, 2019 ($ millions)



*Exports of "special classification provisions" of $292 billion excluded from chart.
Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Florida and Europe

Jobs

224,200

Since 2012: +57,300 (+34.3%)

European companies account for

63%

of foreign affiliate jobs

Employment within Florida, 2020

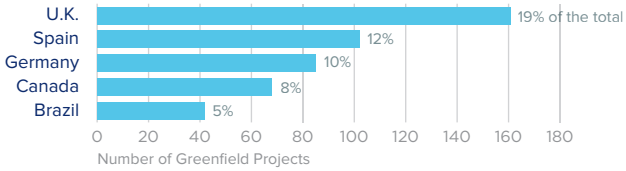
Country	Employment
United Kingdom	66,900
Canada	54,000
Germany	34,000
France	32,700
Switzerland	29,400

On a country basis, U.K. companies operating in Florida represented 19% of total foreign affiliate employment in Florida, with U.K. multinationals supporting approximately 20,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



848

Greenfield Projects (July 2011 - June 2021)

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Trade

Florida Goods Exports to Europe, 2021

$9.7 bn

Transportation Equipment accounts for about 27% of Florida's total exports to Europe.

Florida Goods Imports from Europe, 2021

$26.0 bn

Florida's imports from Europe are concentrated in transportation equipment and chemicals, representing a 19% and 15% share of the state's total imports from Europe, respectively.

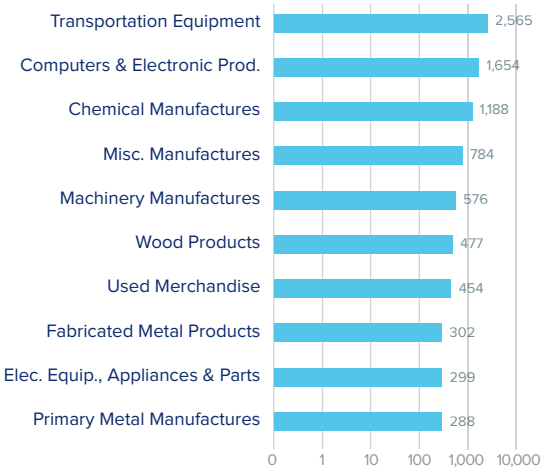
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	1,720
Germany	1,454
Netherlands	1,143
Italy	770
France	759

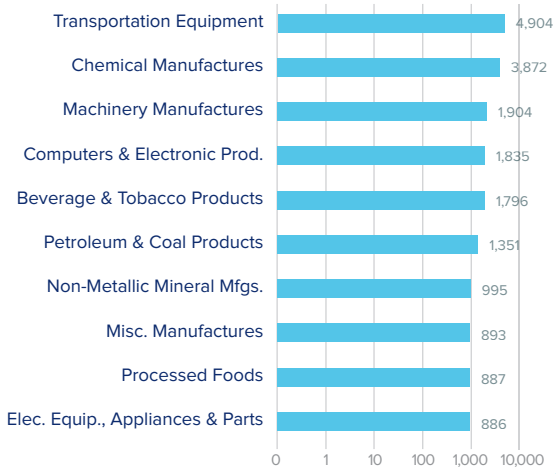
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	4,729
France	3,335
Ireland	3,204
Italy	2,735
United Kingdom	2,204

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Georgia and Europe

Jobs

160,300

Since 2012: +36,600 (+29.6%)

European companies account for

58%

of foreign affiliate jobs

Employment within Georgia, 2020

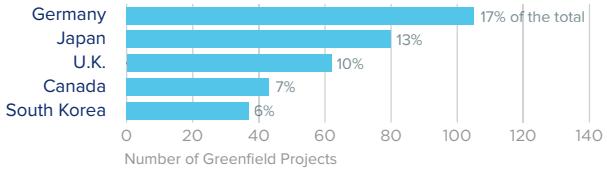
Country	Employment
Japan	36,100
Germany	33,900
United Kingdom	33,000
Canada	32,400
France	24,500

On a country basis, German companies operating in Georgia represented 12% of total foreign affiliate employment in Georgia, with German multinationals supporting approximately 11,000 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Georgia Goods Exports to Europe, 2021

$9.9 bn

Around third of Georgia's exports to Europe consist of transportation equipment.

Georgia Goods Imports from Europe, 2021

$31.3 bn

Transportation equipment, chemicals and machinery manufactures were the top product imports from Europe.

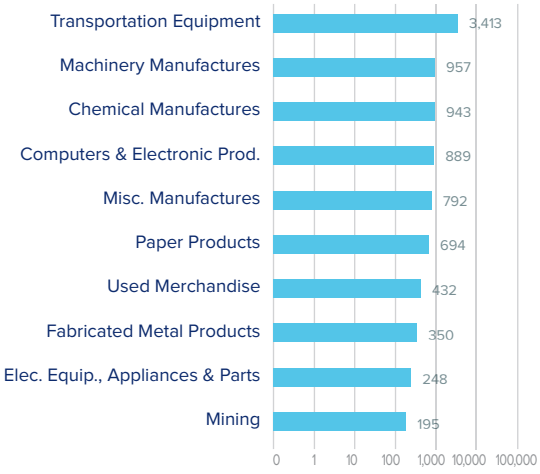
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	2,451
Netherlands	1,239
United Kingdom	1,009
Belgium	828
Italy	557

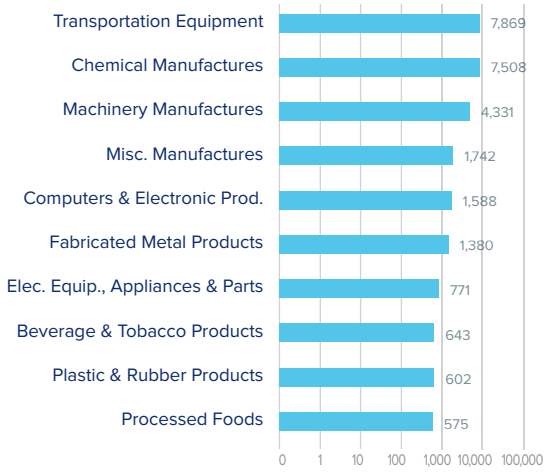
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	8,648
United Kingdom	3,532
France	2,985
Italy	2,454
Belgium	2,396

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Hawaii and Europe

Jobs

12,800

Since 2012: -1,500 (-10.5%)

European companies account for

31%

of foreign affiliate jobs

Employment within Hawaii, 2020

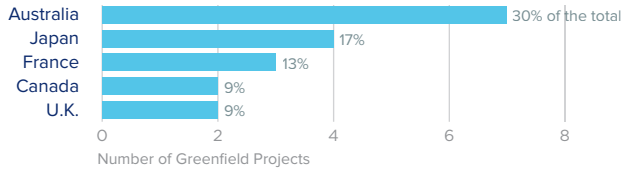
Country	Employment
Japan	21,500
France	3,700
United Kingdom	2,200
Germany	1,800
Canada	1,300

On a country basis, French companies operating in Hawaii represented 9% of total foreign affiliate employment in Hawaii, with French multinationals supporting approximately 2,300 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Hawaii Goods Exports to Europe, 2021

$18.7 mn

Transportation equipment and computer & electronic products led the way as top export categories.

Hawaii Goods Imports from Europe, 2021

$336.4 mn

Hawaii's top European import category was oil & gas, which made up 55% of total imports in 2021, followed by computers & electronic products.

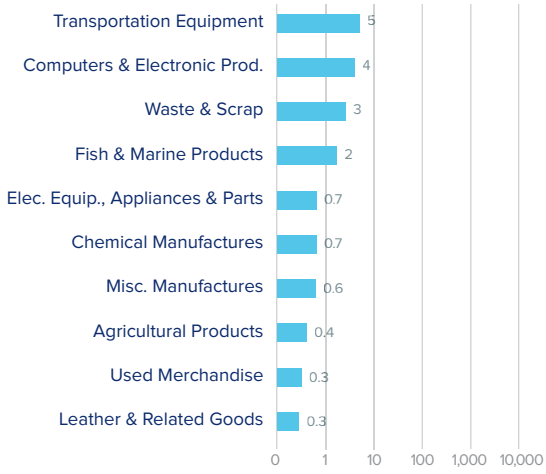
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	4
Germany	3
Russia	2
Sweden	2
Italy	1

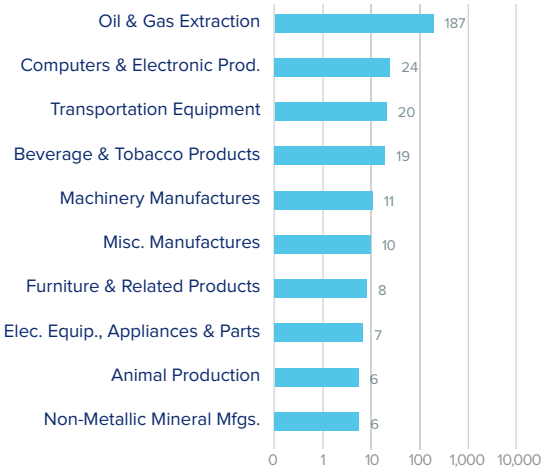
Top European Import Markets, 2021

Country	Imports ($ millions)
Russia	187
United Kingdom	27
Italy	25
Germany	21
Netherlands	16

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Idaho and Europe

Jobs

12,900

Since 2012: +1,800 (+16.2%)

European companies account for **67%** of foreign affiliate jobs

Employment within Idaho, 2020

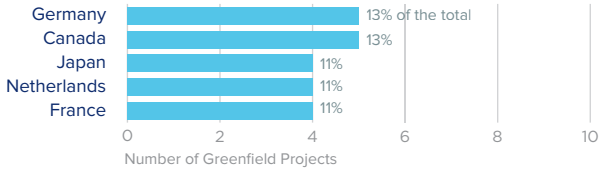
Country	Employment
Canada	3,900
Germany	2,800
France	2,700
United Kingdom	2,600
Japan	1,100

On a country basis, German companies operating in Idaho represented 15% of total foreign affiliate employment in Idaho, with German multinationals supporting approximately 900 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



38

Greenfield Projects (July 2011 - June 2021)

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Trade

Idaho Goods Exports to Europe, 2021

$346.5 mn

Chemicals, processed foods and agricultural products were Idaho's top export products to Europe.

Idaho Goods Imports from Europe, 2021

$569.5 mn

Machinery and computers & electronic products represented a combined 52% share of the state's total imports from Europe.

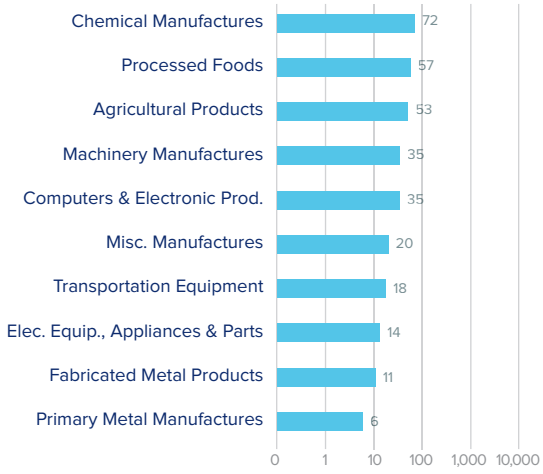
Top European Export Markets, 2021

Country	Exports ($ millions)
Netherlands	104
United Kingdom	77
Denmark	24
Germany	22
Belgium	17

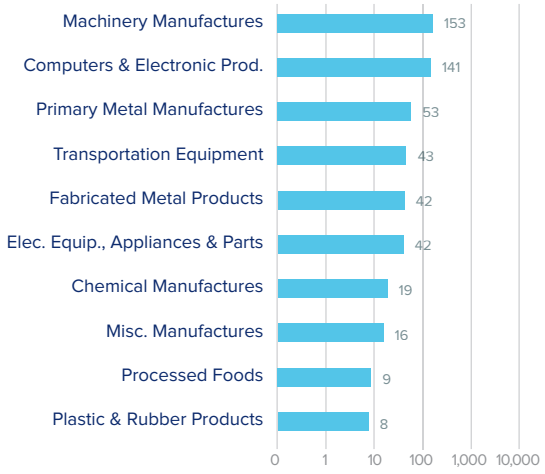
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	106
United Kingdom	68
Greece	63
Netherlands	54
France	52

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Illinois and Europe

Jobs

227,700

Since 2012: +37,900 (+20.0%)

European companies account for

61%

of foreign affiliate jobs

Employment within Illinois, 2020

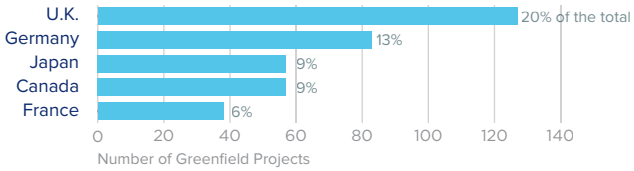
Country	Employment
United Kingdom	60,100
Japan	57,700
Germany	46,900
Canada	38,500
France	32,600

On a country basis, U.K. companies operating in Illinois represented 16% of total foreign affiliate employment in Illinois, with U.K. multinationals supporting approximately 1,600 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



635

Greenfield Projects (July 2011 - June 2021)

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Trade

Illinois Goods Exports to Europe, 2021

$14.2 bn

Chemicals and computers & electronic products are top exports, followed by machinery and transportation equipment.

Illinois Goods Imports from Europe, 2021

$38.1 bn

Chemicals, machinery and metals were the state's top imports from Europe.

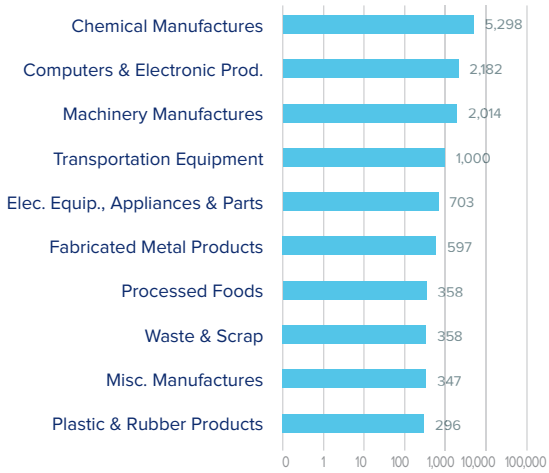
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	3,759
United Kingdom	2,540
Netherlands	1,545
Belgium	1,053
Ireland	967

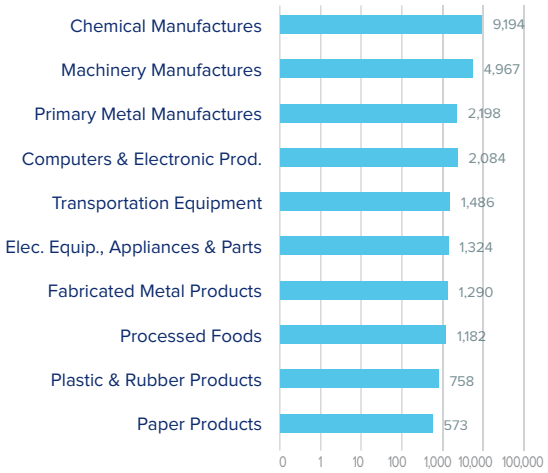
Top European Import Markets, 2021

Country	Imports ($ millions)
Netherlands	9,790
Germany	9,648
United Kingdom	2,741
Italy	2,407
Ireland	2,069

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Indiana and Europe

Jobs

117,600

Since 2012: +26,600 (+29.2%)

European companies account for

58%

of foreign affiliate jobs

Employment within Indiana, 2020

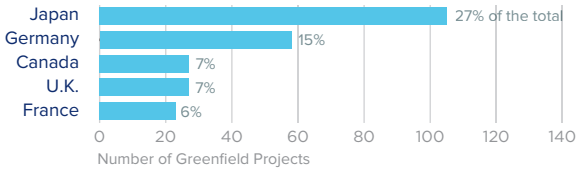
Country	Employment
Japan	55,200
France	30,500
United Kingdom	27,700
Germany	19,100
Canada	16,000

On a country basis, French companies operating in Indiana represented 15% of total foreign affiliate employment in Indiana, with French multinationals supporting approximately 15,700 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Indiana Goods Exports to Europe, 2021

$10.3 bn

Trade in chemicals represented 47% of total exports.

Indiana Goods Imports from Europe, 2021

$36.6 bn

Chemicals were also the state's largest import from Europe, representing 72% of total imports.

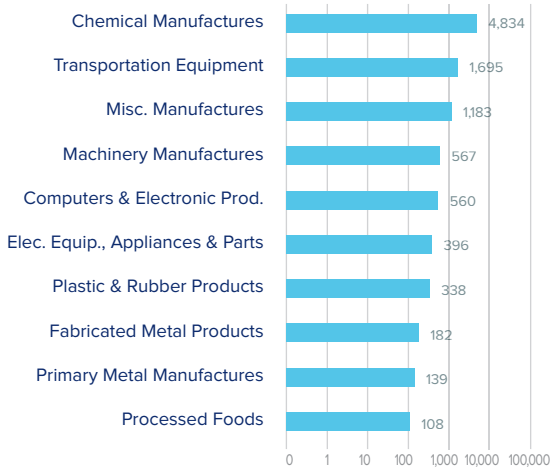
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	2,415
France	1,286
Netherlands	1,263
United Kingdom	1,246
Italy	922

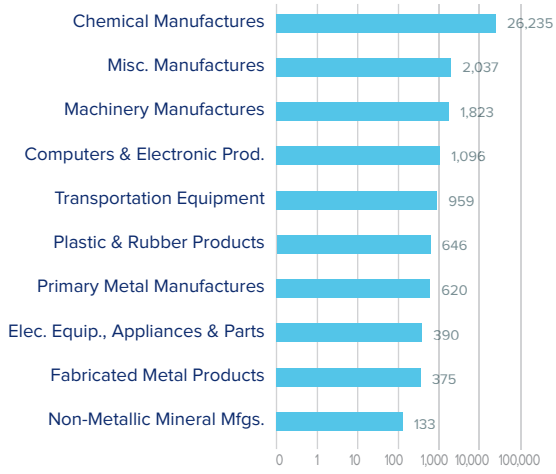
Top European Import Markets, 2021

Country	Imports ($ millions)
Ireland	14,776
Denmark	6,213
Germany	4,341
Switzerland	3,963
France	1,867

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Iowa and Europe

Jobs

35,600

Since 2012: +100 (0.3%)

European companies account for

56%

of foreign affiliate jobs

Employment within Iowa, 2020

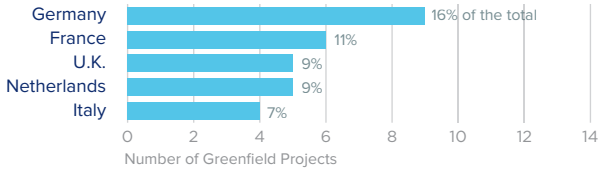
Country	Employment
United Kingdom	7,900
Germany	7,400
Netherlands	5,500
Japan	5,200
France	4,200

On a country basis, U.K. companies operating in Iowa represented 12% of total foreign affiliate employment in Iowa, with U.K. multinationals supporting approximately 2,500 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Iowa Goods Exports to Europe, 2021

$3.0 bn

Machinery manufactures accounted for 34% of total exports, or roughly one billion. Chemicals, the second largest export category, represented about half of that amount.

Iowa Goods Imports from Europe, 2021

$2.7 bn

Machinery manufactures and chemicals were also the top product imports from Europe.

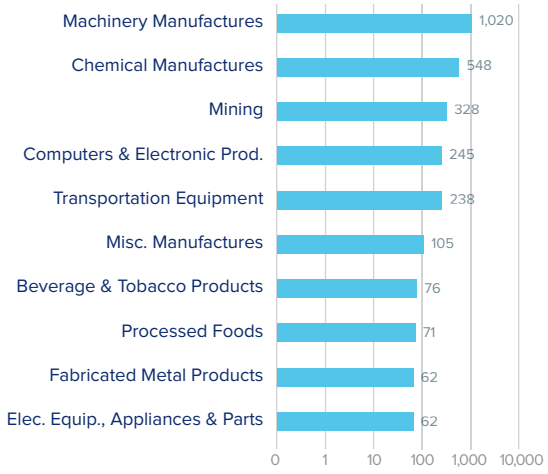
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	681
Netherlands	400
United Kingdom	329
France	214
Italy	178

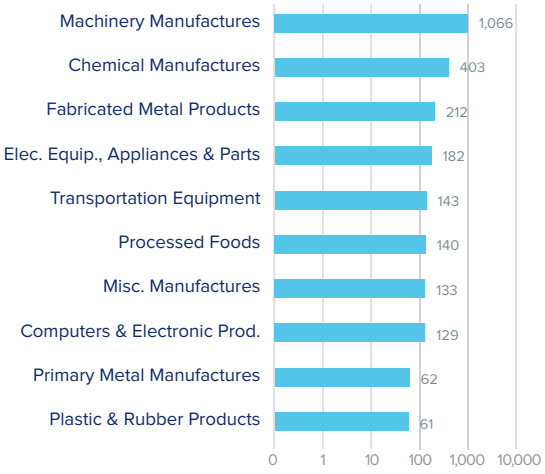
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	808
Italy	404
France	202
United Kingdom	200
Austria	159

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Kansas and Europe

Jobs

41,800

Since 2012: +7,200 (+20.8%)

European companies account for

60%

of foreign affiliate jobs

Employment within Kansas, 2020

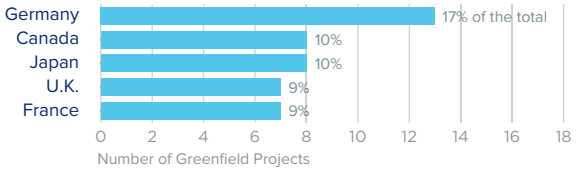
Country	Employment
Germany	10,200
United Kingdom	8,700
Canada	8,000
Switzerland	7,400
Japan	5,800

On a country basis, German companies operating in Kansas represented 15% of total foreign affiliate employment in Kansas, with German multinationals supporting approximately 4,300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Kansas Goods Exports to Europe, 2021

$2.0 bn

Over 75% of Kansas's exports to Europe was concentrated in four main export categories: transportation equipment, computer & electronic products, machinery and chemicals.

Kansas Goods Imports from Europe, 2021

$2.8 bn

Machinery manufactures represented 25% of the state's total imports from Europe.

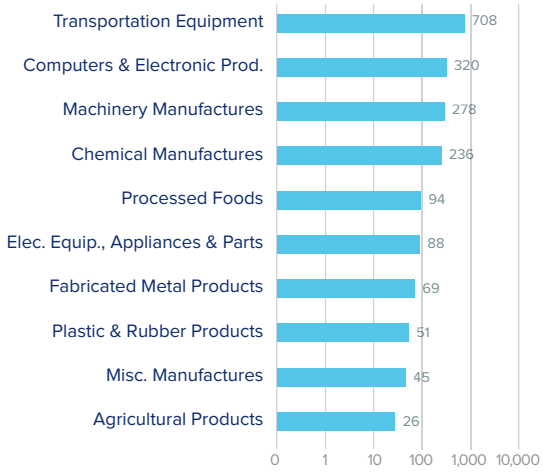
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	479
United Kingdom	374
France	190
Netherlands	131
Russia	83

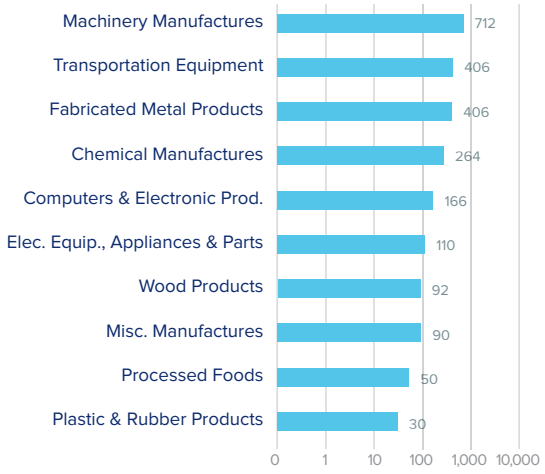
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	962
United Kingdom	315
Italy	228
Spain	220
France	152

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Kentucky and Europe

Jobs

61,100

Since 2012: +19,000 (+45.1%)

European companies account for

44%

of foreign affiliate jobs

Employment within Kentucky, 2020

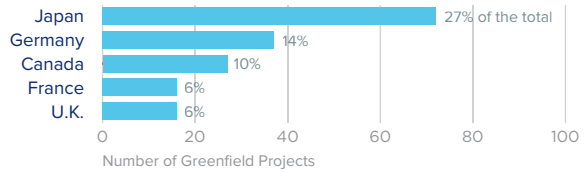
Country	Employment
Japan	43,800
Germany	16,200
Canada	11,300
France	10,500
United Kingdom	9,200

On a country basis, German companies operating in Kentucky represented 12% of total foreign affiliate employment in Kentucky, with German multinationals supporting approximately 7,300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Kentucky Goods Exports to Europe, 2021

$8.9 bn

Reflecting the large presence of automobile manufacturers in the state, Kentucky's top export to Europe in 2021 was transportation equipment (44% of total exports).

Kentucky Goods Imports from Europe, 2021

$23.6 bn

Chemical manufactures were the state's largest import, followed by machinery.

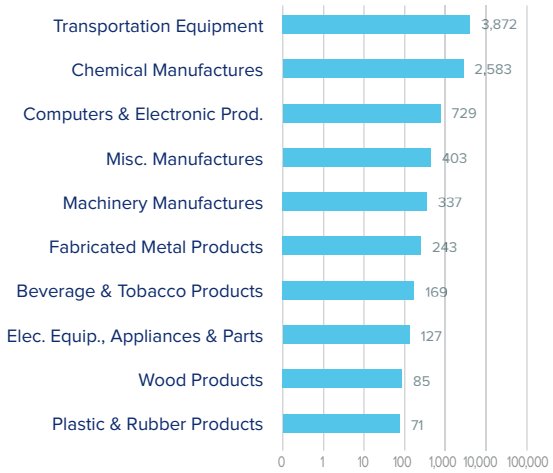
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	2,601
France	1,885
Netherlands	1,240
Germany	786
Austria	745

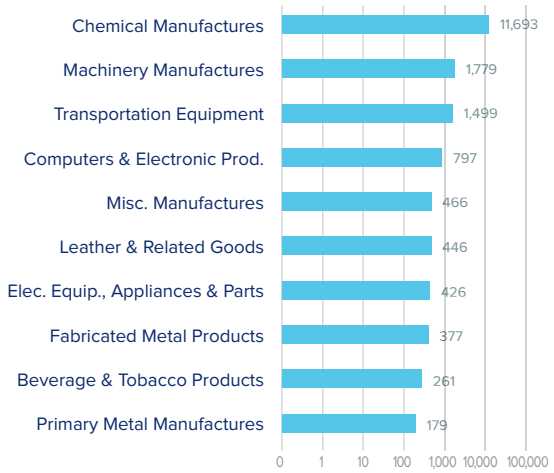
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	4,743
Ireland	4,491
Germany	2,979
Italy	2,532
Netherlands	2,341

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Louisiana and Europe

Jobs

46,500

Since 2012: +6,300 (+15.7%)

European companies account for

61%

of foreign affiliate jobs

Employment within Louisiana, 2020

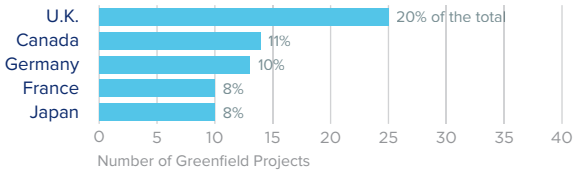
Country	Employment
United Kingdom	15,800
Canada	13,600
France	9,900
Germany	6,800
Switzerland	4,400

On a country basis, U.K. companies operating in Louisiana represented 21% of total foreign affiliate employment in Louisiana, with U.K. multinationals supporting approximately 1,900 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Louisiana Goods Exports to Europe, 2021

$13.0 bn

The majority of the state's exports consist of energy, chemical and agricultural products.

Louisiana Goods Imports from Europe, 2021

$9.9 bn

Petroleum & coal products were Louisiana's top imported good from Europe.

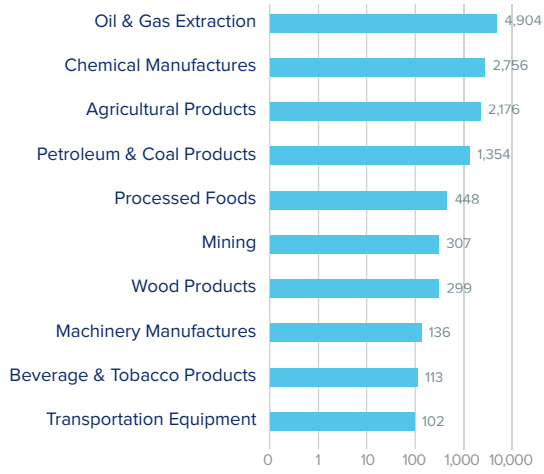
Top European Export Markets, 2021

Country	Exports ($ millions)
Netherlands	2,214
United Kingdom	1,992
Spain	1,745
Belgium	1,166
Germany	1,152

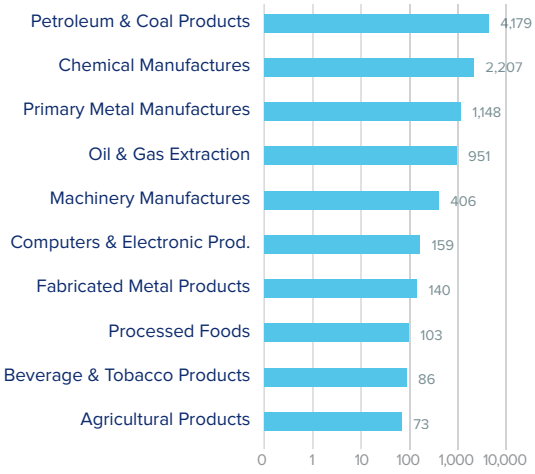
Top European Import Markets, 2021

Country	Imports ($ millions)
Russia	5,476
United Kingdom	817
Germany	481
France	349
Kazakhstan	291

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Maine and Europe

Jobs

24,500

Since 2012: +2,600 (+11.9%)

European companies account for

64%

of foreign affiliate jobs

Employment within Maine, 2020

Country	Employment
Netherlands	17,500
Canada	9,600
Switzerland	2,500
United Kingdom	2,400
Germany	1,700

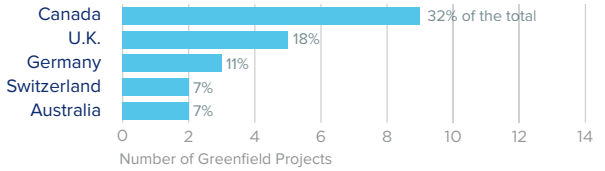
On a country basis, Dutch companies operating in Maine represented 46% of total foreign affiliate employment in Maine, with Dutch multinationals supporting approximately 17,200 more jobs in 2020 than in 2012.

*Netherlands employment data suppressed to avoid disclosure of individual company data. Range of 10,000 - 24,999 employees given.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Maine Goods Exports to Europe, 2021

$0.6 bn

Maine's exports to Europe are relatively diverse, with top products including transportation equipment, electronic products, chemicals and paper products.

Maine Goods Imports from Europe, 2021

$1.1 bn

Petroleum & coal products represent 28% of Maine's total imports from Europe, followed by machinery and transportation equipment.

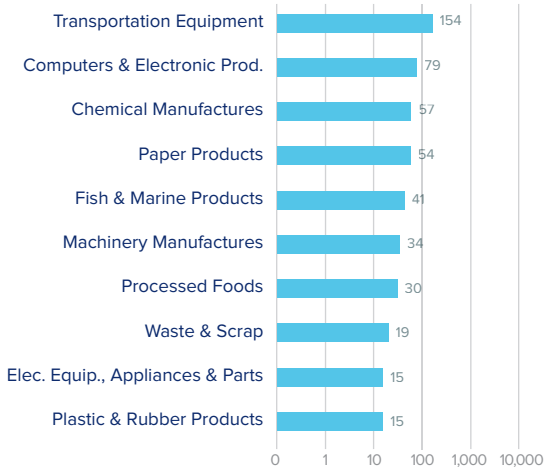
Top European Export Markets, 2021

Country	Exports ($ millions)
Netherlands	84
Germany	78
United Kingdom	77
Italy	49
Belgium	41

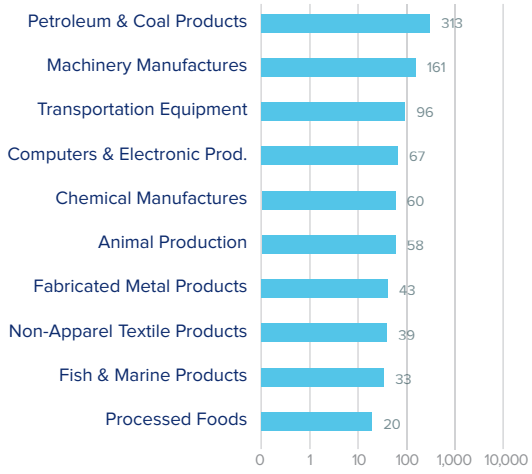
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	205
United Kingdom	148
Netherlands	126
Italy	80
Norway	72

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Maryland and Europe

Jobs

89,100

Since 2012: +4,500 (+5.3%)

European companies account for

80%

of foreign affiliate jobs

Employment within Maryland, 2020

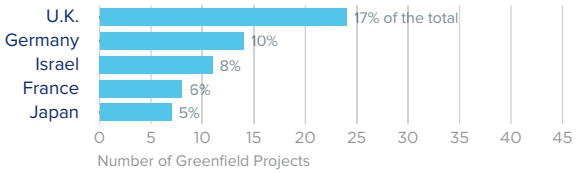
Country	Employment
United Kingdom	25,900
Netherlands	25,300
Canada	11,300
Germany	10,100
France	9,000

On a country basis, U.K. companies operating in Maryland represented 23% of total foreign affiliate employment in Maryland, with U.K. multinationals supporting approximately 7,800 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Maryland Goods Exports to Europe, 2021

$6.1 bn

The state's top exports are transportation equipment, chemicals and oil & gas.

Maryland Goods Imports from Europe, 2021

$15.2 bn

Transportation equipment and machinery manufactures were the top product imports.

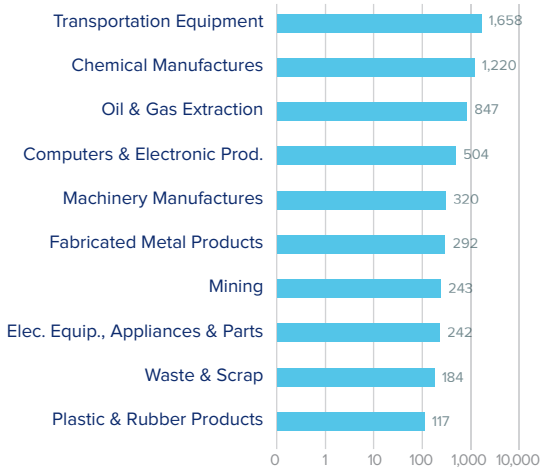
Top European Export Markets, 2021

Country	Exports ($ millions)
France	1,579
Netherlands	1,182
United Kingdom	723
Germany	680
Belgium	395

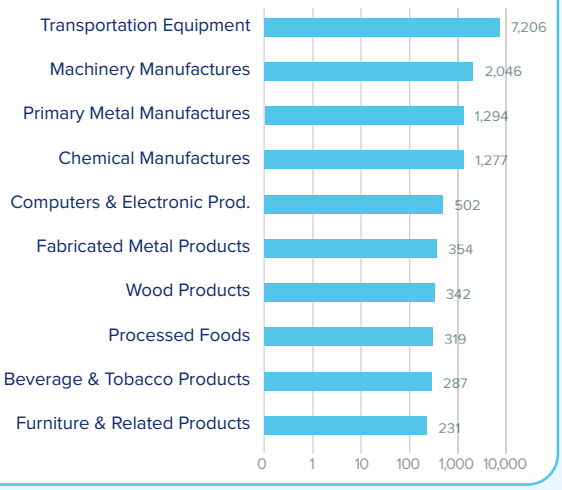
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	5,445
United Kingdom	1,853
Sweden	953
Italy	834
Finland	598

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Massachusetts and Europe

Jobs

165,200

Since 2012: +20,700 (+14.3%)

European companies account for

73%

of foreign affiliate jobs

Employment within Massachusetts, 2020

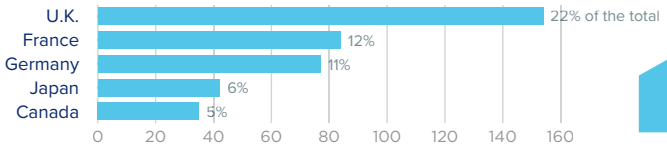
Country	Employment
United Kingdom	43,700
Netherlands	32,800
France	25,900
Japan	24,200
Canada	21,900

On a country basis, U.K. companies operating in Massachusetts represented 19% of total foreign affiliate employment in Massachusetts, with U.K. multinationals supporting approximately 5,700 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



699

Greenfield Projects (July 2011 - June 2021)

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Trade

Massachusetts Goods Exports to Europe, 2021

$11.8 bn

Chemicals and electronic products were the top exports to Europe, followed by machinery.

Massachusetts Goods Imports from Europe, 2021

$14.6 bn

Key imports from Europe include miscellaneous manufactured products, chemicals and computer & electronic products.

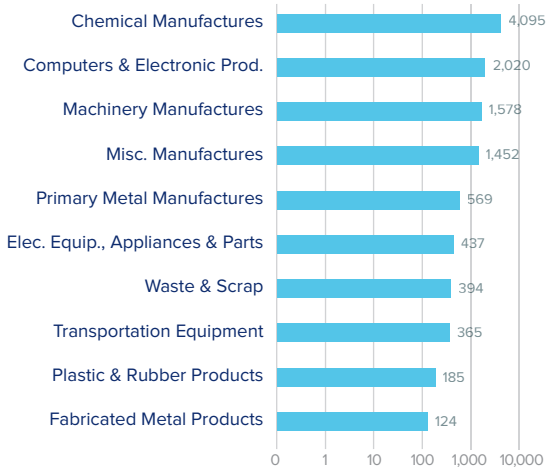
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	1,939
Netherlands	1,674
Belgium	1,153
United Kingdom	1,118
France	929

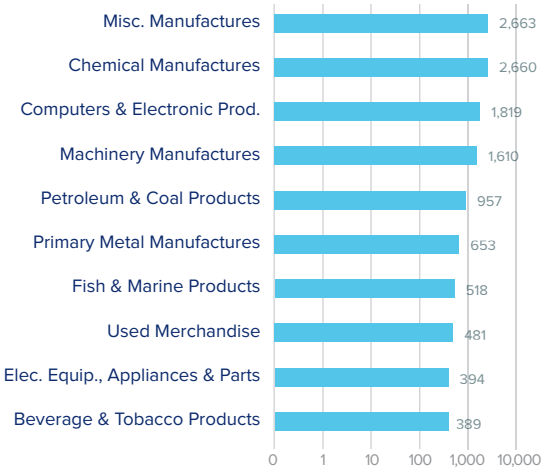
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	2,701
Ireland	2,085
United Kingdom	1,994
Italy	1,294
Switzerland	1,268

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Michigan and Europe

Jobs

205,400

Since 2012: +79,900 (+63.7%)

European companies account for

65%

of foreign affiliate jobs

Employment within Michigan, 2020

Country	Employment
Germany	52,100
Netherlands	37,500
United Kingdom	37,400
Japan	34,900
Canada	31,300

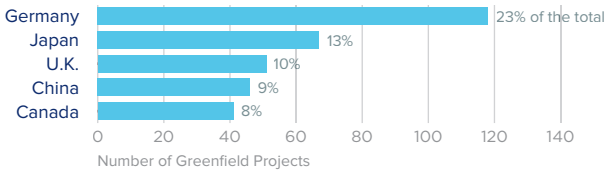
On a country basis, German companies operating in Michigan represented 16% of total foreign affiliate employment in Michigan, with German multinationals supporting approximately 22,600 more jobs in 2020 than in 2012.

*Netherlands employment data suppressed to avoid disclosure of individual company data. Range of 25,000 - 49,999 employees given.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Michigan Goods Exports to Europe, 2021

$6.9 bn

Transportation equipment is the largest exported product, representing 29% of the state's total exports to Europe.

Michigan Goods Imports from Europe, 2021

$13.8 bn

Imports from Europe mainly consist of transportation equipment and machinery.

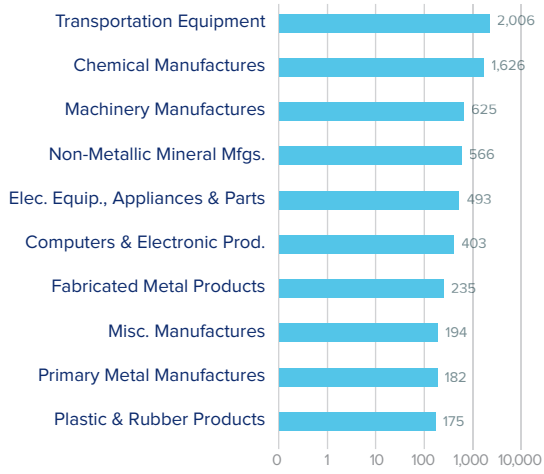
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	1,713
Belgium	824
Spain	709
Italy	598
United Kingdom	574

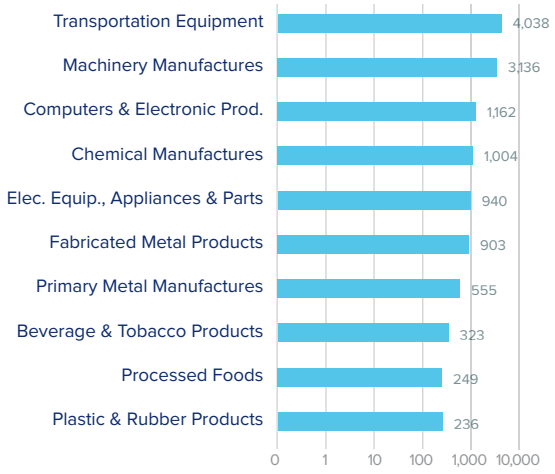
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	4,745
Italy	2,775
France	885
United Kingdom	653
Hungary	652

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Minnesota and Europe

Jobs

97,700

Since 2012: +35,900 (+58.1%)

European companies account for

61%

of foreign affiliate jobs

Employment within Minnesota, 2020

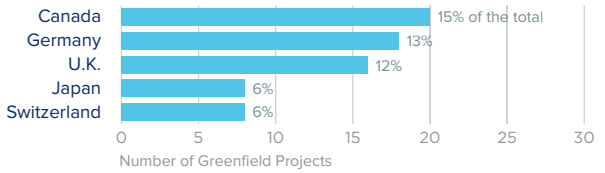
Country	Employment
Canada	30,300
Germany	22,600
United Kingdom	19,500
Japan	10,800
France	8,700

On a country basis, German companies operating in Minnesota represented 14% of total foreign affiliate employment in Minnesota, with German multinationals supporting approximately 12,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Minnesota Goods Exports to Europe, 2021

$4.8 bn

Computers & electronic products account for almost one-quarter of Minnesota's exports to Europe.

Minnesota Goods Imports from Europe, 2021

$4.6 bn

Computers & electronic products were also the state's top import category from Europe.

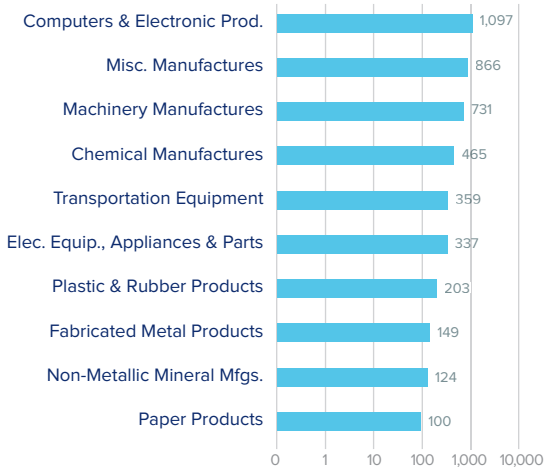
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	820
Belgium	627
United Kingdom	549
Ireland	547
Netherlands	538

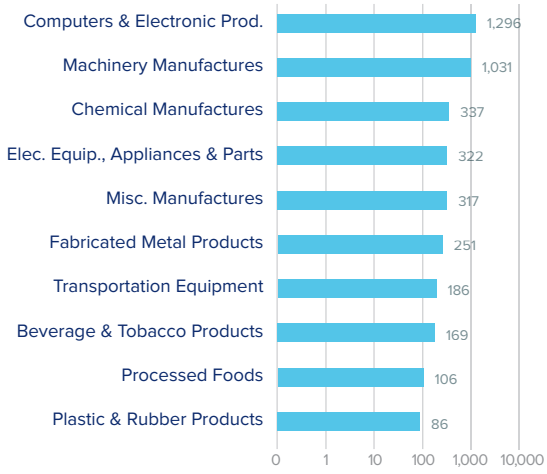
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	1,170
Ireland	742
Italy	562
United Kingdom	402
France	270

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Mississippi and Europe

Jobs

22,800
Since 2012: +1,900 (9.1%)

European companies account for
49%
of foreign affiliate jobs

Employment within Mississippi, 2020

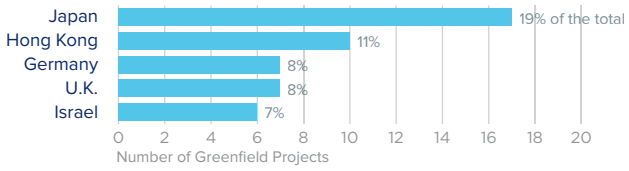
Country	Employment
Japan	9,000
France	6,800
United Kingdom	5,500
Canada	5,100
Germany	3,800

On a country basis, French companies operating in Mississippi represented 15% of total foreign affiliate employment in Mississippi, with French multinationals supporting approximately 3,300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



89
Greenfield Projects (July 2011 - June 2021)

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Trade

Mississippi Goods Exports to Europe, 2021

$2.3 bn

Petroleum & coal products represented about 27% of Mississippi's total exports to Europe in 2021. The next largest export category was miscellaneous manufactures, accounting for 19% of total exports.

Mississippi Goods Imports from Europe, 2021

$4.2 bn

Imports from Europe were relatively diverse, with eight different product categories each accounting for over $200 million worth of European imports in 2021.

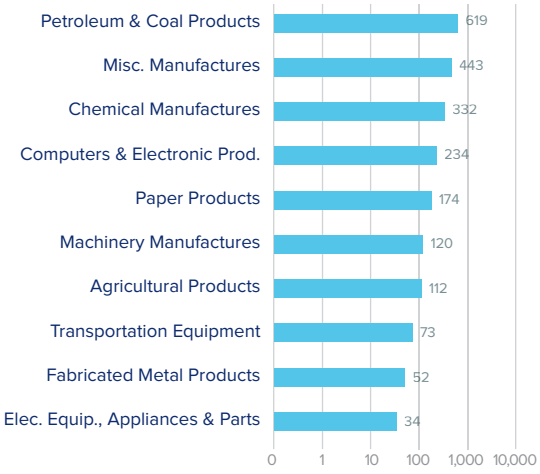
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	700
Netherlands	503
Germany	251
Turkey	182
United Kingdom	158

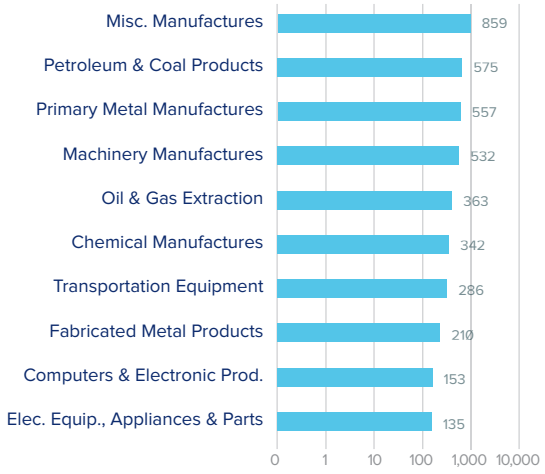
Top European Import Markets, 2021

Country	Imports ($ millions)
Russia	910
Germany	768
United Kingdom	522
Ireland	521
France	330

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Missouri and Europe

Jobs

94,800

Since 2012: +30,300 (+47.0%)

European companies account for

66%

of foreign affiliate jobs

Employment within Missouri, 2020

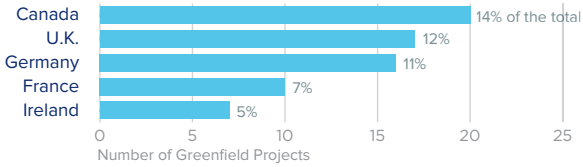
Country	Employment
Germany	23,200
United Kingdom	19,200
Japan	15,900
Canada	15,900
Switzerland	14,600

On a country basis, German companies operating in Missouri represented 16% of total foreign affiliate employment in Missouri, with German multinationals supporting approximately 11,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



142

Greenfield Projects (October 2010 -September 2020)*

*Data unavailable for latest year.

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Trade

Missouri Goods Exports to Europe, 2021

$2.8 bn

The top exports to Europe from Missouri in 2021 were chemicals, machinery and computers & electronic products.

Missouri Goods Imports from Europe, 2021

$6.1 bn

Chemicals and computers & electronic products were the top imported goods from Europe.

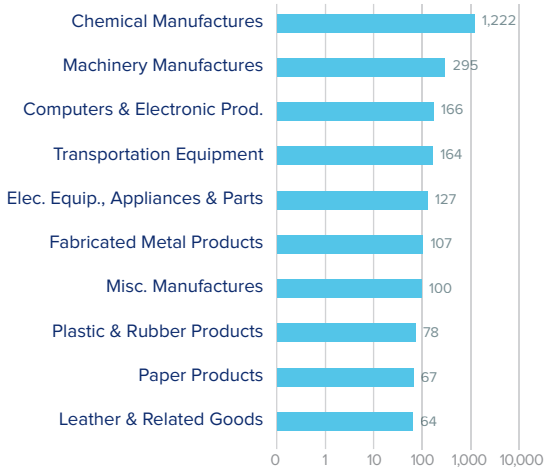
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	677
France	365
United Kingdom	353
Belgium	310
Netherlands	223

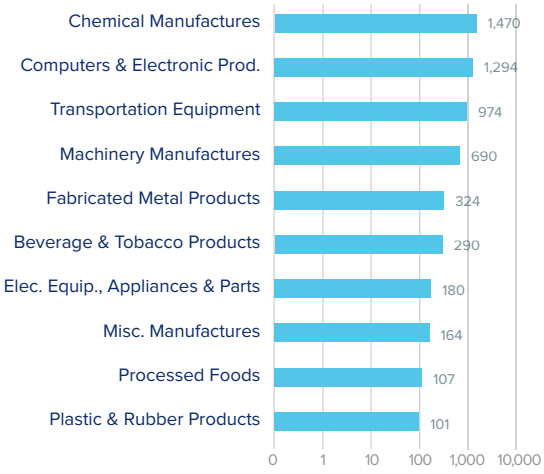
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	2,676
France	829
Italy	414
Belgium	318
United Kingdom	304

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Montana and Europe

Jobs

5,600
Since 2012: +800
(16.7%)

European companies account for
59%
of foreign affiliate jobs

Employment within Montana, 2020

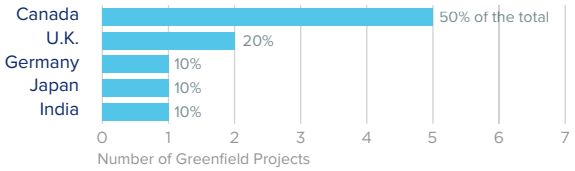
Country	Employment
United Kingdom	2,600
Canada	1,200
France	1,200
Japan	400
Germany	300

On a country basis, U.K. companies operating in Montana represented 27% of total foreign affiliate employment in Montana, with U.K. multinationals supporting approximately 300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



10
Greenfield Projects
(July 2011 - June 2021)

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Trade

Montana Goods Exports to Europe, 2021

$292.9 mn

Exports are relatively small and skewed towards chemicals, machinery and mining.

Montana Goods Imports from Europe, 2021

$158.6 mn

Montana's imports from Europe are also small and dominated by machinery.

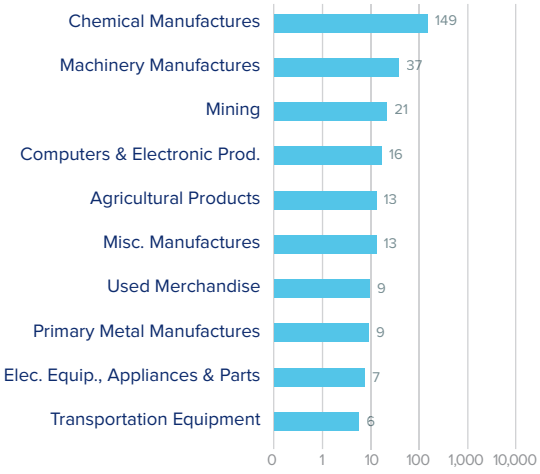
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	85
United Kingdom	39
Netherlands	27
Germany	23
France	22

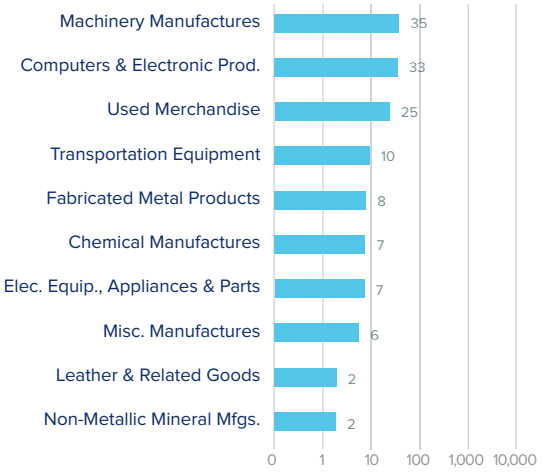
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	37
United Kingdom	31
Italy	20
France	16
Netherlands	14

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Nebraska and Europe

Jobs

18,200

Since 2012: +2,800 (+18.2%)

European companies account for

50%

of foreign affiliate jobs

Employment within Nebraska, 2020

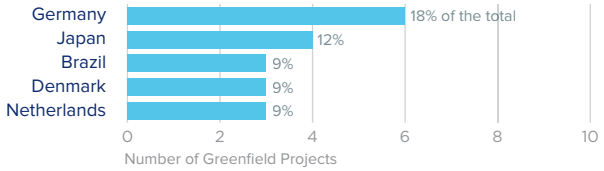
Country	Employment
Japan	5,800
United Kingdom	4,600
France	4,200
Germany	3,100
Canada	2,700

On a country basis, U.K. companies operating in Nebraska represented 13% of total foreign affiliate employment in Nebraska, with U.K. multinationals supporting approximately 100 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Nebraska Goods Exports to Europe, 2021

$0.9 bn

The top exports to Europe consist of chemicals, machinery, and miscellaneous manufactures.

Nebraska Goods Imports from Europe, 2021

$1.5 bn

Chemicals represented almost 50% of Nebraska's total imports from Europe in 2021.

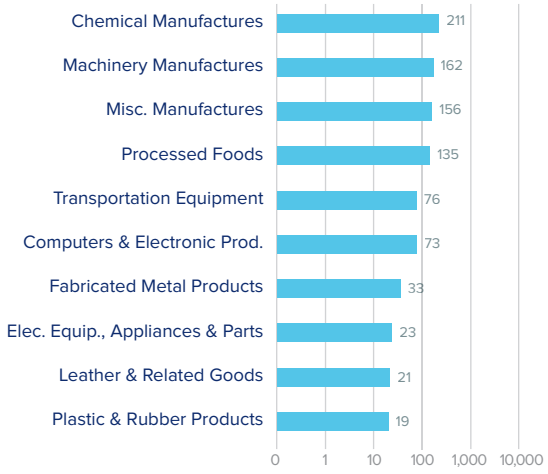
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	173
Netherlands	143
Germany	113
France	107
Spain	71

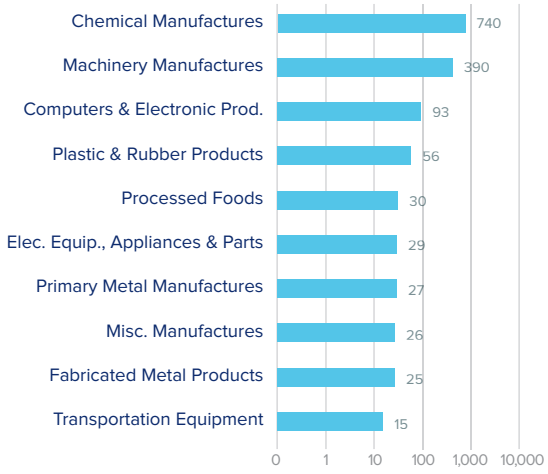
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	337
Germany	334
United Kingdom	186
Ireland	154
France	132

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Nevada and Europe

Jobs

31,500

Since 2012: +7,300 (+30.2%)

European companies account for

55%

of foreign affiliate jobs

Employment within Nevada, 2020

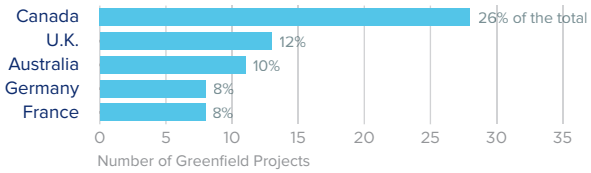
Country	Employment
Canada	10,000
France	9,000
United Kingdom	8,900
Japan	6,900
Germany	4,200

On a country basis, French companies operating in Nevada represented 16% of total foreign affiliate employment in Nevada, with French multinationals supporting approximately 5,000 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Nevada Goods Exports to Europe, 2021

$3.8 bn

Primary metal manufactures account for over half of Nevada's total exports to Europe.

Nevada Goods Imports from Europe, 2021

$2.7 bn

Imports from Europe to Nevada are diverse, with top imports consisting of transportation equipment, machinery and chemicals.

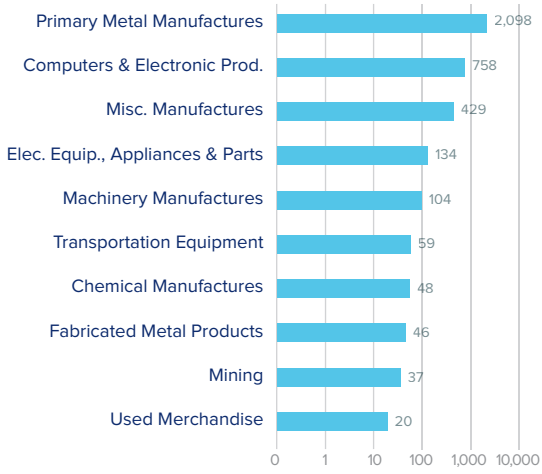
Top European Export Markets, 2021

Country	Exports ($ millions)
Switzerland	2,133
Germany	369
Netherlands	267
Hungary	264
United Kingdom	171

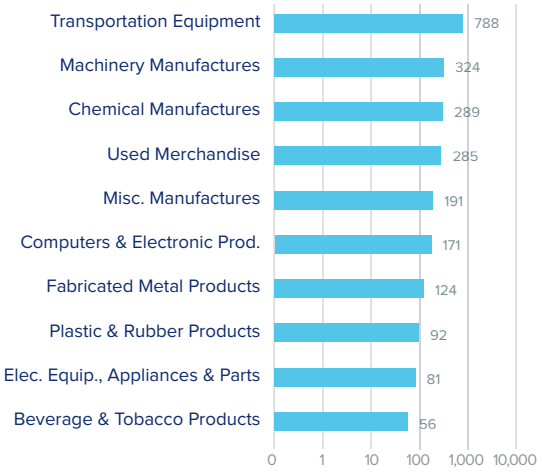
Top European Import Markets, 2021

Country	Imports ($ millions)
France	1,036
Germany	364
Spain	283
Switzerland	231
Italy	135

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

New Hampshire and Europe

Jobs

35,700

Since 2012: +7,500 (+26.6%)

European companies account for

71%

of foreign affiliate jobs

Employment within New Hampshire, 2020

Country	Employment
United Kingdom	12,900
Netherlands	7,500
Canada	6,200
Japan	4,900
France	4,100

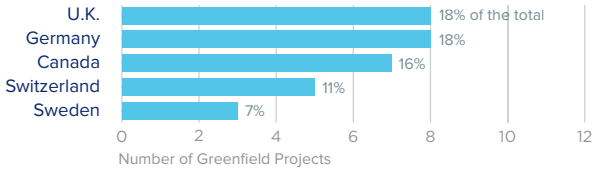
On a country basis, U.K. companies operating in New Hampshire represented 26% of total foreign affiliate employment in New Hampshire, with U.K. multinationals supporting approximately 2,600 more jobs in 2020 than in 2012.

*Netherlands employment data suppressed to avoid disclosure of individual company data. Range of 5,000 to 9,999 employees given.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

New Hampshire Goods Exports to Europe, 2021

$2.5 bn

Transportation equipment and chemicals were the top two exports to Europe from New Hampshire in 2021. Combined these two exports made up almost 55% of the state's total exports to Europe.

New Hampshire Goods Imports from Europe, 2021

$3.1 bn

Transportation equipment represented 36% of the state's total imports from Europe.

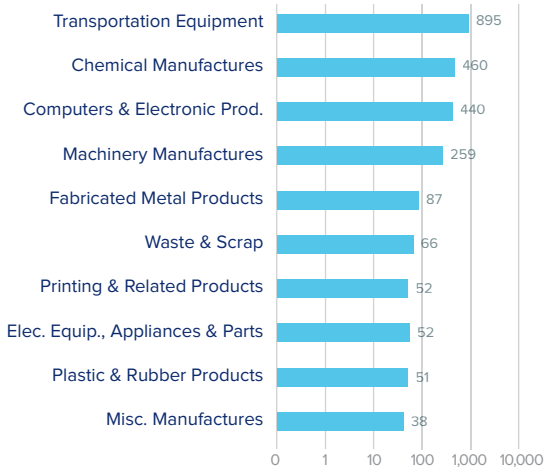
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	915
Ireland	336
Netherlands	201
France	177
United Kingdom	150

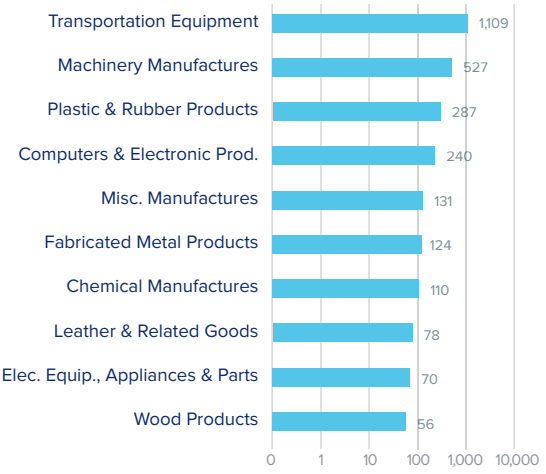
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	620
Poland	619
Sweden	254
Italy	235
United Kingdom	222

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

New Jersey and Europe

Jobs

199,100

Since 2012: +32,900 (+19.8%)

European companies account for

69%

of foreign affiliate jobs

Employment within New Jersey, 2020

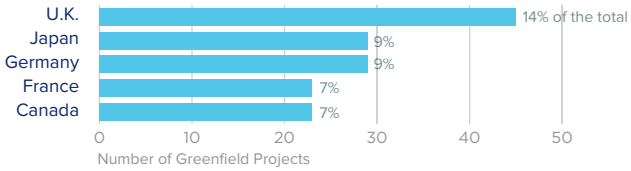
Country	Employment
France	41,400
United Kingdom	36,200
Germany	33,600
Switzerland	32,500
Canada	26,600

On a country basis, French companies operating in New Jersey represented 14% of total foreign affiliate employment in New Jersey, with French multinationals supporting approximately 11,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



323

Greenfield Projects (July 2011 - June 2021)

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Trade

New Jersey Goods Exports to Europe, 2021

$16.0 bn

Top exports consist of primary metal manufactures and waste & scrap.

New Jersey Goods Imports from Europe, 2021

$72.3 bn

About one-third of New Jersey's imports from Europe in 2021 was related to the chemicals industry.

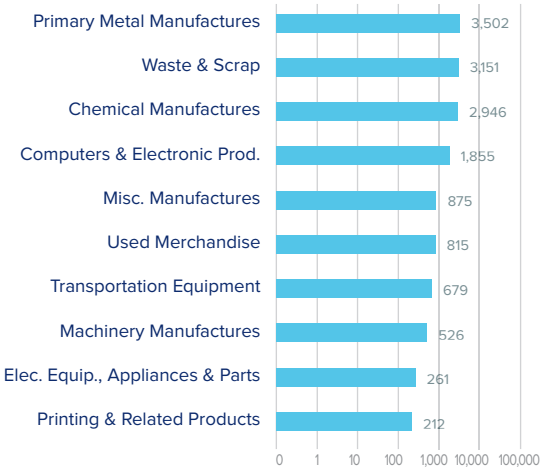
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	4,360
Italy	2,478
Germany	2,100
Netherlands	1,569
Belgium	994

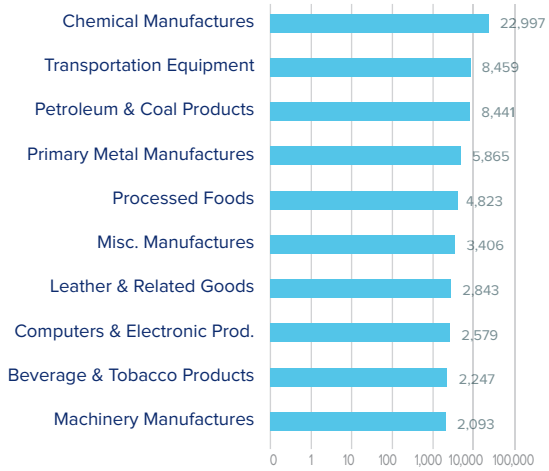
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	12,100
Italy	10,436
United Kingdom	7,859
Germany	7,857
Russia	5,072

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

New Mexico and Europe

Jobs

12,000
Since 2012: -400
(-3.2%)

European companies account for
66%
of foreign affiliate jobs

Employment within New Mexico, 2020

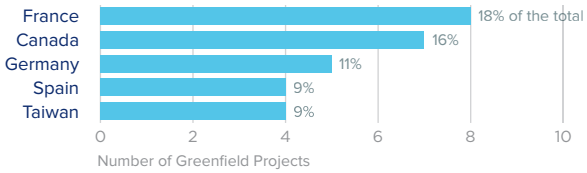
Country	Employment
United Kingdom	3,500
Canada	3,300
Germany	3,100
France	1,600
Japan	1,300

On a country basis, U.K. companies operating in New Mexico represented 19% of total foreign affiliate employment in New Mexico, with U.K. multinationals supporting approximately 100 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



44
Greenfield Projects
(July 2011 - June 2021)

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Trade

New Mexico Goods Exports to Europe, 2021

$363.0 mn

Exports are relatively small, with computers & electronic products, transportation equipment and machinery the largest export categories for New Mexico.

New Mexico Goods Imports from Europe, 2021

$461.6 mn

Computers & electronic products were the largest imported good from Europe, followed by chemicals.

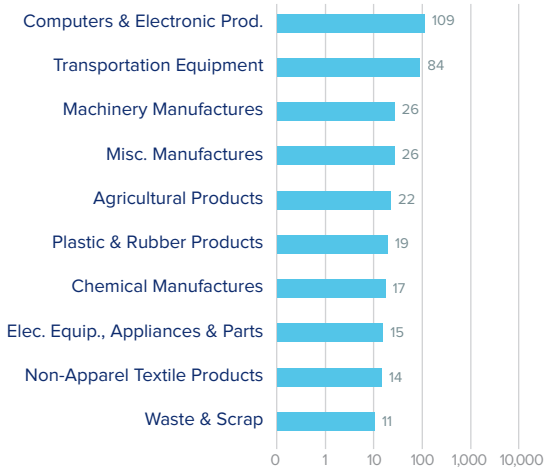
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	68
Germany	62
Romania	43
Italy	43
United Kingdom	35

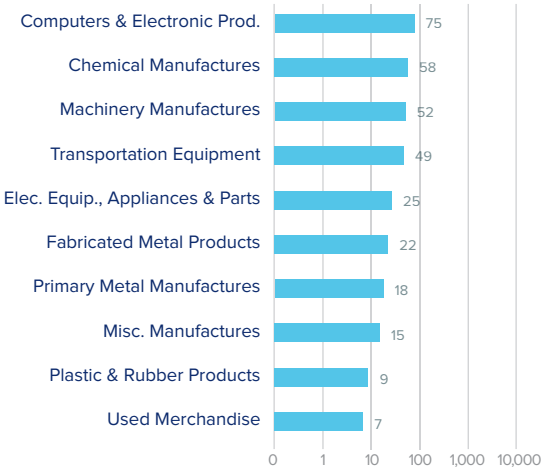
Top European Import Markets, 2021

Country	Imports ($ millions)
United Kingdom	93
Germany	72
Switzerland	61
France	49
Spain	40

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

New York and Europe

Jobs

361,200

Since 2012: +60,800 (+20.2%)

European companies account for **70%** of foreign affiliate jobs

Employment within New York, 2020

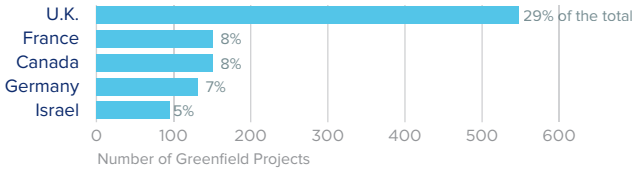
Country	Employment
United Kingdom	107,600
France	54,500
Canada	52,100
Germany	49,700
Japan	41,400

On a country basis, U.K. companies operating in New York represented 21% of total foreign affiliate employment in New York, with U.K. multinationals supporting approximately 18,700 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



1,890

Greenfield Projects (July 2011 - June 2021)

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Trade

New York Goods Exports to Europe, 2021

$29.1 bn

Primary metal manufactures and miscellaneous merchandise were the top goods exports to Europe.

New York Goods Imports from Europe, 2021

$51.3 bn

New York's imports from Europe are relatively diverse. Primary metal manufactures and chemical products were the state's top imports from Europe in 2021.

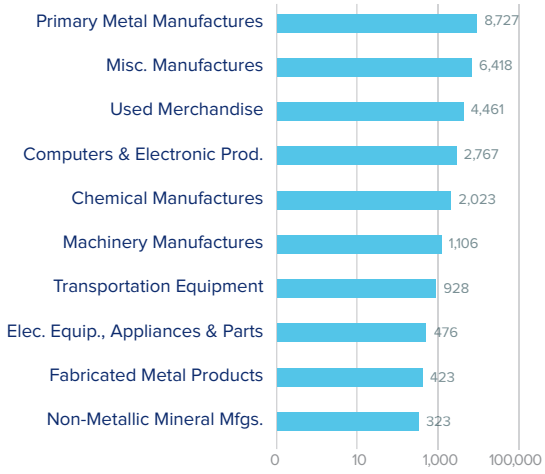
Top European Export Markets, 2021

Country	Exports ($ millions)
Switzerland	11,561
United Kingdom	3,860
Germany	3,588
Belgium	2,440
France	2,063

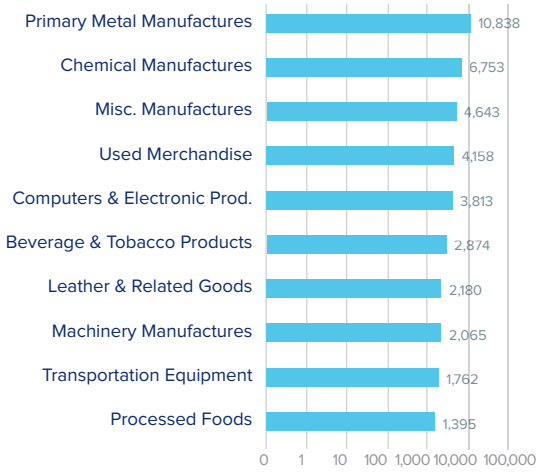
Top European Import Markets, 2021

Country	Imports ($ millions)
Switzerland	13,884
France	7,603
Italy	6,430
Germany	4,843
United Kingdom	3,985

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

North Carolina and Europe

Jobs

203,300

Since 2012: +45,800 (+29.1%)

European companies account for **69%** of foreign affiliate jobs

Employment within North Carolina, 2020

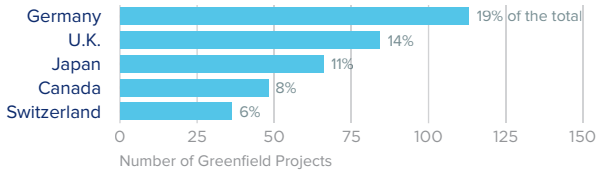
Country	Employment
Germany	41,800
United Kingdom	39,200
Netherlands	37,500
Japan	27,400
Canada	22,500

On a country basis, German companies operating in North Carolina represented 14% of total foreign affiliate employment in North Carolina, with German multinationals supporting approximately 13,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



597

Greenfield Projects (July 2011 - June 2021)

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Trade

North Carolina Goods Exports to Europe, 2021

$8.4 bn

Chemical manufactures account for over 40% of total exports to Europe.

North Carolina Goods Imports from Europe, 2021

$29.8 bn

Imports from Europe mainly consist of chemicals, machinery and transportation equipment.

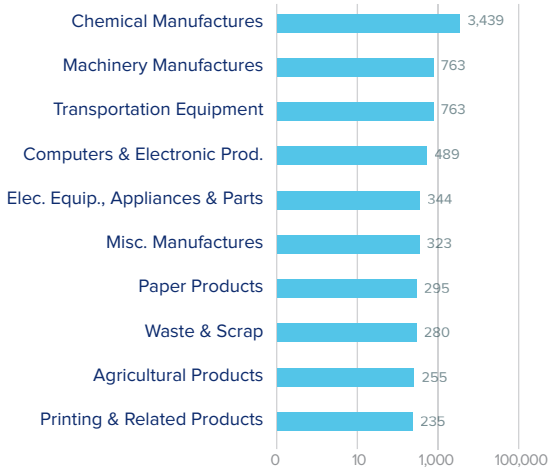
Top European Export Markets, 2021

Country	Exports ($ millions)
France	1,386
Netherlands	946
Germany	873
United Kingdom	847
Belgium	801

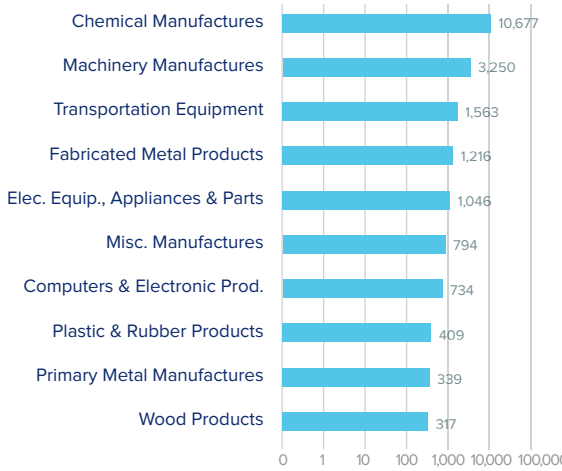
Top European Import Markets, 2021

Country	Imports ($ millions)
Ireland	8,792
Germany	7,519
Netherlands	2,032
Italy	1,916
United Kingdom	1,635

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

North Dakota and Europe

Jobs

5,500
Since 2012: -1,700
(-23.6%)

European companies account for
35%
of foreign affiliate jobs

Employment within North Dakota, 2020

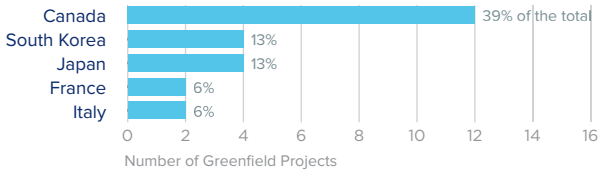
Country	Employment
Canada	3,300
United Kingdom	2,000
Japan	900
Netherlands	900
France	750

On a country basis, U.K. companies operating in North Dakota represented 13% of total foreign affiliate employment in North Dakota, with U.K. multinationals supporting approximately 500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



31
Greenfield Projects
(July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

North Dakota Goods Exports to Europe, 2021

$298.4 mn

33% of the state's exports to Europe consist of machinery manufactures.

North Dakota Goods Imports from Europe, 2021

$354.7 mn

Machinery is North Dakota's primary product import from Europe, representing about half of total imports.

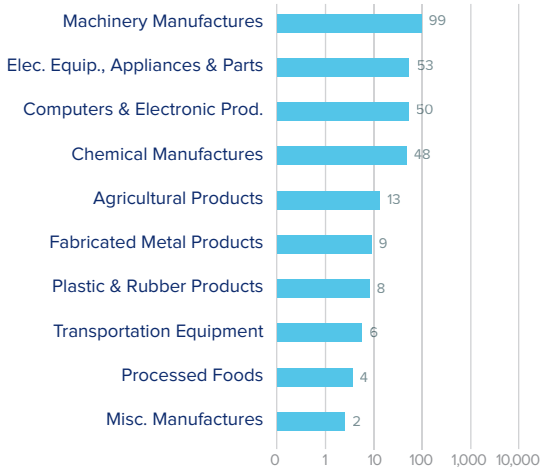
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	82
Belgium	40
Czech Republic	24
Russia	23
Switzerland	17

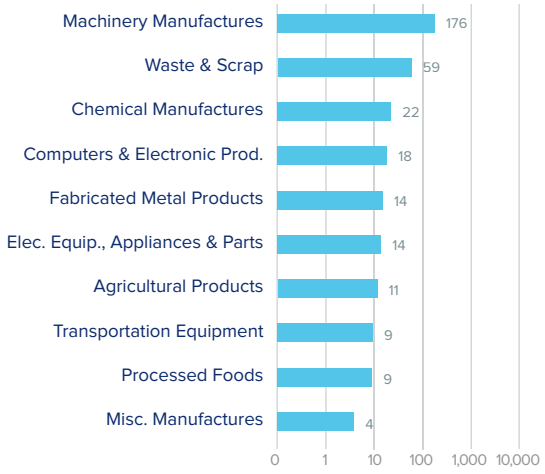
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	94
France	71
Italy	45
Hungary	23
United Kingdom	18

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Ohio and Europe

Jobs

168,900

Since 2012: +33,200 (+24.5%)

European companies account for

56%

of foreign affiliate jobs

Employment within Ohio, 2020

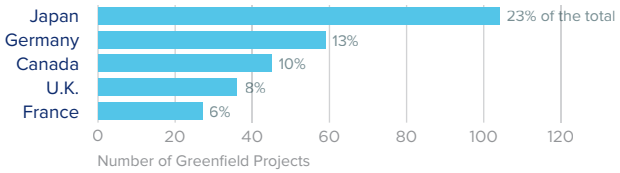
Country	Employment
Japan	67,000
United Kingdom	40,300
Germany	35,500
Canada	28,600
France	24,500

On a country basis, U.K. companies operating in Ohio represented 13% of total foreign affiliate employment in Ohio, with U.K. multinationals supporting approximately 4,100 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



452

Greenfield Projects (July 2011 - June 2021)

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Trade

Ohio Goods Exports to Europe, 2021

$9.0 bn

Chemicals, transportation equipment and machinery are the state's top exports to Europe.

Ohio Goods Imports from Europe, 2021

$18.7 bn

Chemical manufactures make up 35% of Ohio's imports from Europe.

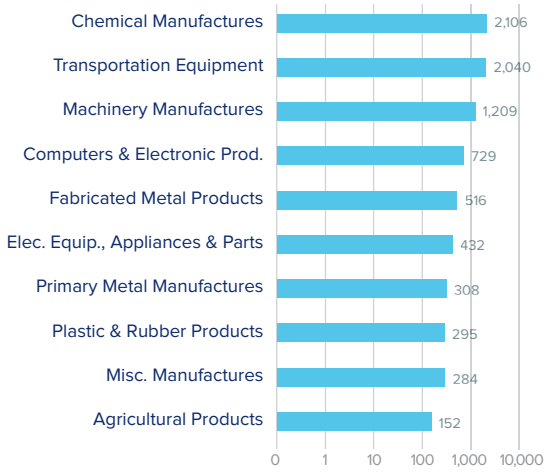
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	1,483
Netherlands	1,384
Germany	1,248
France	1,134
Belgium	896

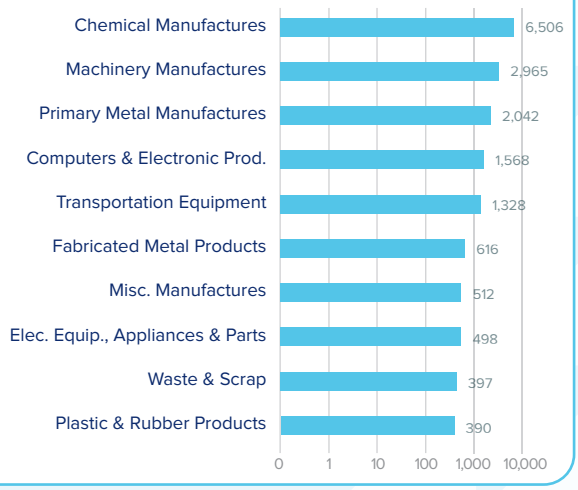
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	4,514
Ireland	2,770
Italy	1,936
France	1,276
United Kingdom	1,150

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Oklahoma and Europe

Jobs

38,900

Since 2012: +9,400 (+31.9%)

European companies account for

63%

of foreign affiliate jobs

Employment within Oklahoma, 2020

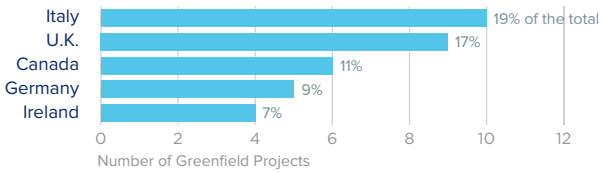
Country	Employment
United Kingdom	9,700
France	8,500
Canada	6,900
Japan	6,400
Germany	4,500

On a country basis, U.K. companies operating in Oklahoma represented 16% of total foreign affiliate employment in Oklahoma, with U.K. multinationals supporting approximately 1,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



54

Greenfield Projects (July 2011 - June 2021)

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Trade

Oklahoma Goods Exports to Europe, 2021

$1.4 bn

The top exports to Europe from Oklahoma include transportation equipment, electronic products and chemicals.

Oklahoma Goods Imports from Europe, 2021

$1.7 bn

Metal and machinery manufactures are the top products imported from Europe.

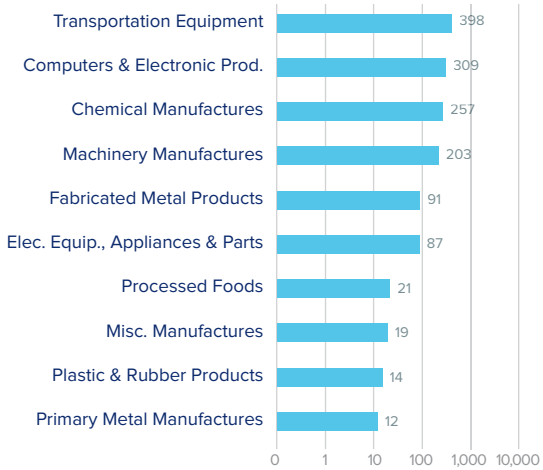
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	650
Netherlands	290
United Kingdom	165
Norway	40
France	39

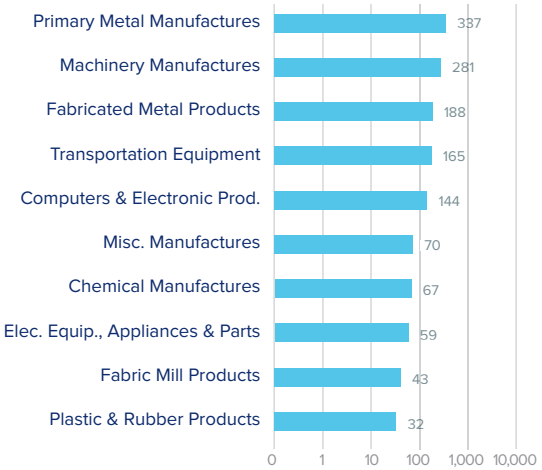
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	332
Switzerland	222
United Kingdom	187
France	172
Italy	158

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; Foreign Trade Division, U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Oregon and Europe

Jobs

47,900

Since 2012: +14,600 (+43.8%)

European companies account for **68%** of foreign affiliate jobs

Employment within Oregon, 2020

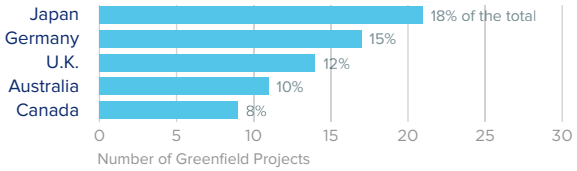
Country	Employment
United Kingdom	16,000
Germany	11,000
Japan	9,600
Canada	6,000
Switzerland	6,000

On a country basis, U.K. companies operating in Oregon represented 23% of total foreign affiliate employment in Oregon, with U.K. multinationals supporting approximately 8,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



114

Greenfield Projects (July 2011 - June 2021)

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Trade

Oregon Goods Exports to Europe, 2021

$3.0 bn

About 30% of Oregon's exports to Europe consist of computers & electronic products.

Oregon Goods Imports from Europe, 2021

$4.3 bn

Computers & electronic products represented 48% of Oregon's total European imports.

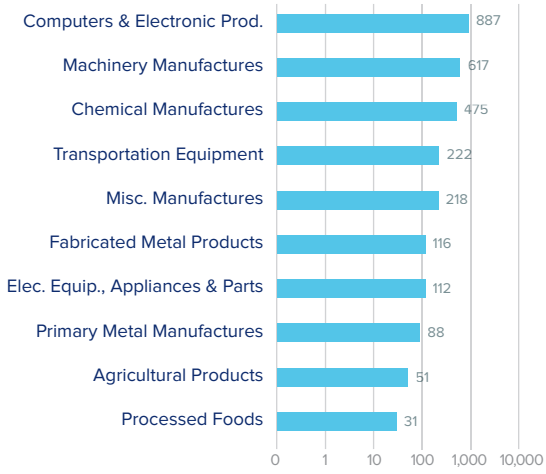
Top European Export Markets, 2021

Country	Exports ($ millions)
Ireland	631
Netherlands	399
Germany	394
Switzerland	346
United Kingdom	199

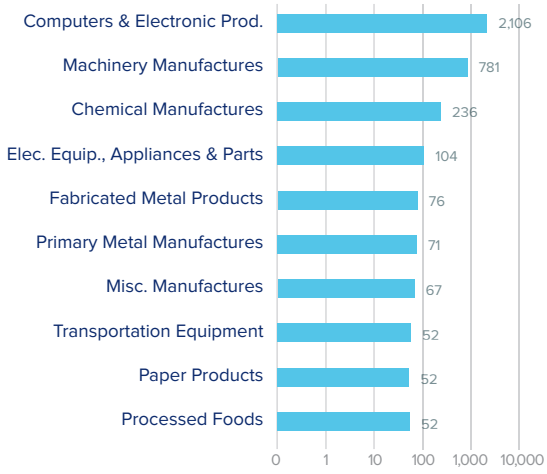
Top European Import Markets, 2021

Country	Imports ($ millions)
Ireland	1,956
Germany	727
Netherlands	443
Switzerland	235
Italy	207

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Pennsylvania and Europe

Jobs

245,100

Since 2012: +34,200 (+16.2%)

European companies account for

74%

of foreign affiliate jobs

Employment within Pennsylvania, 2020

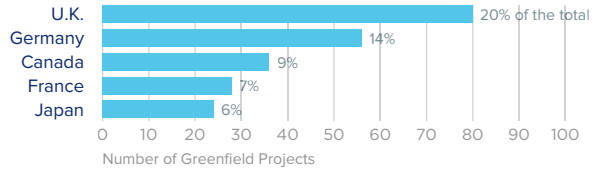
Country	Employment
United Kingdom	55,800
Netherlands	49,700
Germany	42,200
France	29,200
Canada	28,100

On a country basis, U.K. companies operating in Pennsylvania represented 17% of total foreign affiliate employment in Pennsylvania, with U.K. multinationals supporting approximately 2,400 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



401

Greenfield Projects (July 2011 - June 2021)

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Trade

Pennsylvania Goods Exports to Europe, 2021

$12.2 bn

Chemicals and energy were the state's largest exports to Europe.

Pennsylvania Goods Imports from Europe, 2021

$33.9 bn

Imports are heavily concentrated, with chemicals making up over half of the state's total imports from Europe.

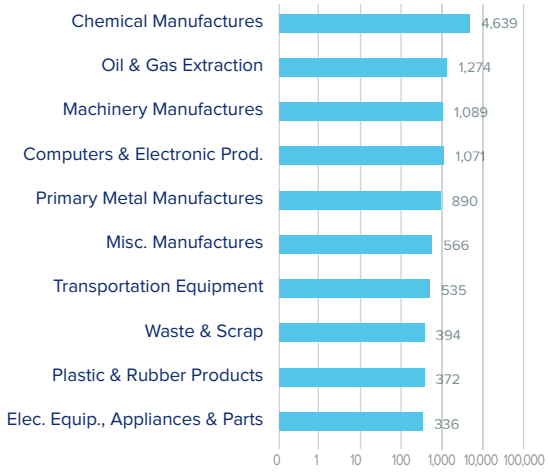
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	1,872
United Kingdom	1,846
Netherlands	1,526
Belgium	1,462
France	873

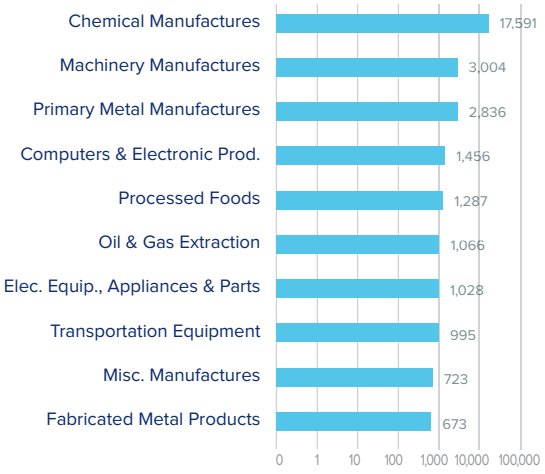
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	8,095
Switzerland	5,043
Belgium	3,039
Italy	2,854
United Kingdom	2,709

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Rhode Island and Europe

Jobs

24,900
Since 2012: +100 (0.4%)

European companies account for
80%
of foreign affiliate jobs

Employment within Rhode Island, 2020

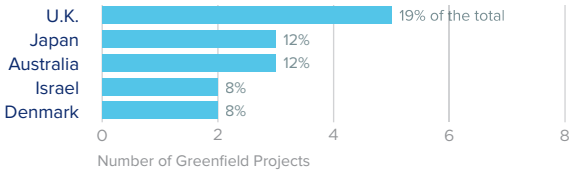
Country	Employment
United Kingdom	5,400
France	4,600
Netherlands	3,750
Canada	2,900
Japan	2,100

On a country basis, U.K. companies operating in Rhode Island represented 17% of total foreign affiliate employment in Rhode Island, with U.K. multinationals supporting approximately 4,600 fewer jobs in 2020 than in 2012.
*Netherlands employment data suppressed to avoid disclosure of individual company data. Range of 2,500 - 4,999 employees given.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



26
Greenfield Projects
(July 2011 - June 2021)

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Trade

Rhode Island Goods Exports to Europe, 2021

$1.2 bn

Waste & scrap account for over 52% of exports to Europe.

Rhode Island Goods Imports from Europe, 2021

$4 bn

The top imported product from Europe is transportation equipment, which represents 52% of the state's total European imports.

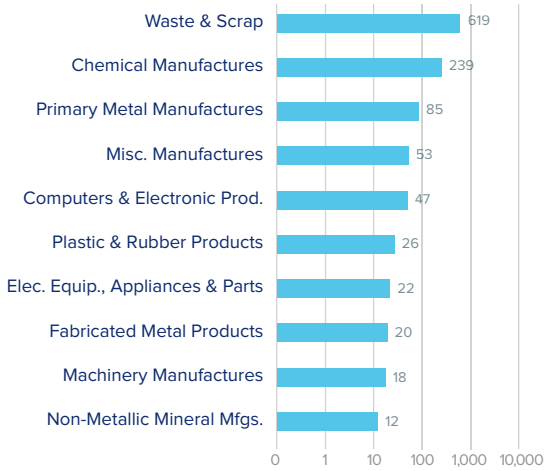
Top European Export Markets, 2021

Country	Exports ($ millions)
Italy	464
Germany	158
Turkey	132
Ireland	132
United Kingdom	76

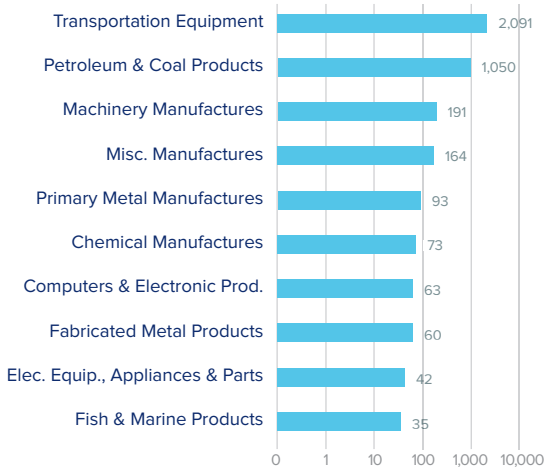
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	1,389
Netherlands	556
Slovakia	504
United Kingdom	284
France	220

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

South Carolina and Europe

Jobs

111,800

Since 2012: +27,000 (+31.8%)

European companies account for **69%** of foreign affiliate jobs

Employment within South Carolina, 2020

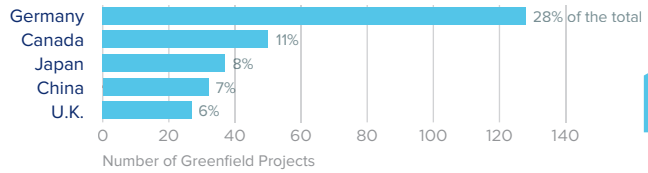
Country	Employment
Germany	37,600
France	22,800
Canada	18,400
Japan	17,600
Netherlands	13,100

On a country basis, German companies operating in South Carolina represented 23% of total foreign affiliate employment in South Carolina, with German multinationals supporting approximately 15,400 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



458

Greenfield Projects (July 2011 - June 2021)

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Trade

South Carolina Goods Exports to Europe, 2021

$9.3 bn

65% of the state's exports consist of transportation equipment, reflecting the state's deep linkages with European auto manufacturers.

South Carolina Goods Imports from Europe, 2021

$18.8 bn

Transportation equipment was also the top imported product from Europe, making up 23% of the state's total European imports.

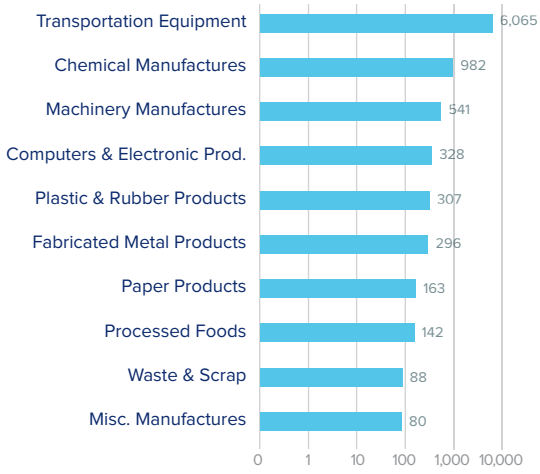
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	4,588
Belgium	1,486
United Kingdom	985
Russia	459
France	340

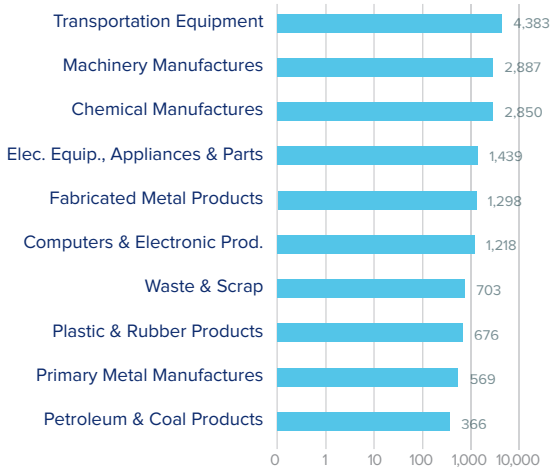
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	7,034
United Kingdom	1,953
Austria	1,263
France	1,073
Italy	842

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

South Dakota and Europe

Jobs

5,700
Since 2012: -400
(-6.6%)

European companies account for
39%
of foreign affiliate jobs

Employment within South Dakota, 2020

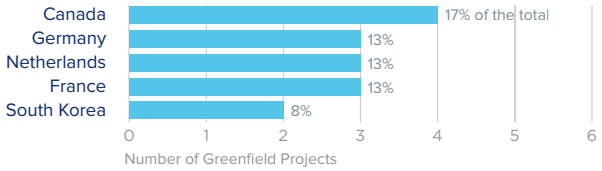
Country	Employment
Canada	3,400
France	1,900
United Kingdom	1,600
Germany	1,200
Switzerland	500

On a country basis, French companies operating in South Dakota represented 13% of total foreign affiliate employment in South Dakota, with French multinationals supporting approximately 900 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



24
Greenfield Projects
(July 2011 - June 2021)

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Trade

South Dakota Goods Exports to Europe, 2021

$187.9 mn

Machinery manufactures are the state's top export to Europe.

South Dakota Goods Imports from Europe, 2021

$223.3 mn

Imports are heavily concentrated, with machinery making up about a third of the state's total imports from Europe. The next largest import category was computers & electronics.

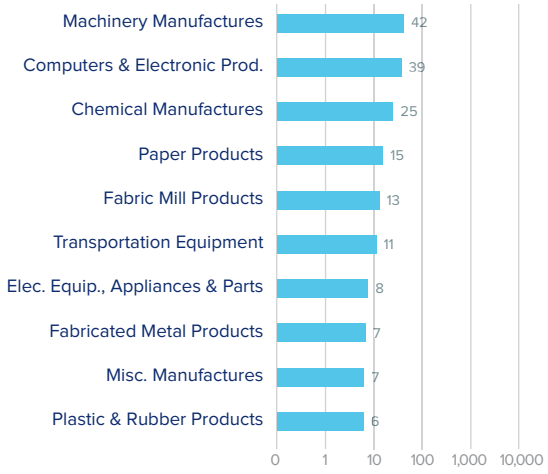
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	41
Belgium	27
United Kingdom	24
Netherlands	24
Ireland	14

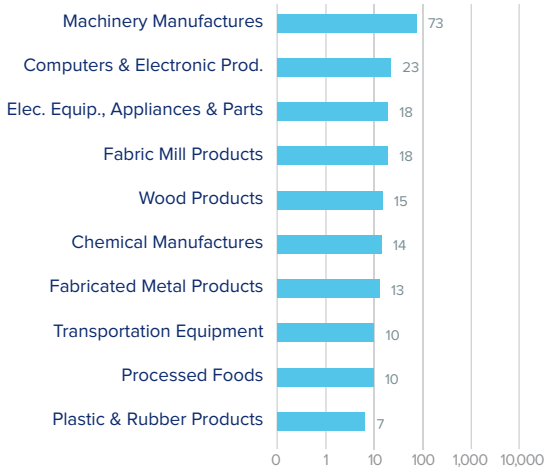
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	49
Italy	21
Netherlands	21
United Kingdom	18
Spain	13

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Tennessee and Europe

Jobs

116,200

Since 2012: +43,900 (+60.7%)

European companies account for

57%

of foreign affiliate jobs

Employment within Tennessee, 2020

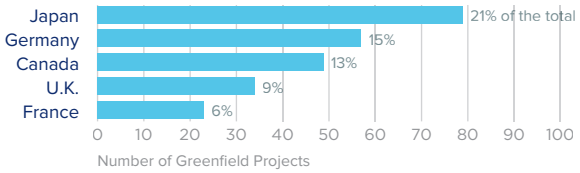
Country	Employment
Japan	47,300
United Kingdom	24,800
France	23,600
Germany	20,700
Canada	15,100

On a country basis, U.K. companies operating in Tennessee represented 12% of total foreign affiliate employment in Tennessee, with U.K. multinationals supporting approximately 7,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



377

Greenfield Projects (July 2011 - June 2021)

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Trade

Tennessee Goods Exports to Europe, 2021

$7.7 bn

Chemicals and miscellaneous manufactured goods are the largest export categories to Europe.

Tennessee Goods Imports from Europe, 2021

$21.3 bn

Chemicals are the top imported good, comprising 57% of the state's total imports from Europe.

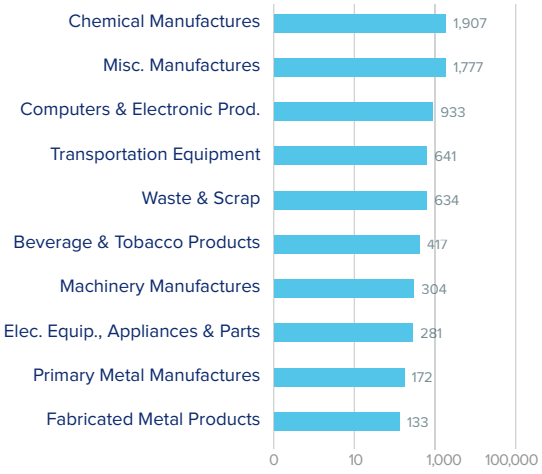
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	1,804
Netherlands	1,668
Germany	1,349
United Kingdom	648
Italy	498

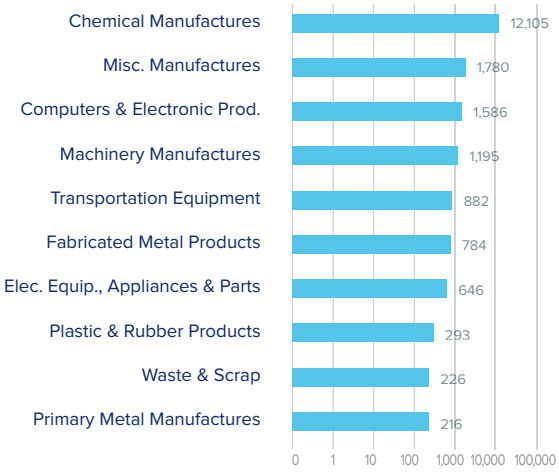
Top European Import Markets, 2021

Country	Imports ($ millions)
Ireland	6,473
Germany	4,155
United Kingdom	2,902
Italy	1,922
Switzerland	1,214

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Texas and Europe

Jobs

393,100

Since 2012: +89,000 (+29.3%)

European companies account for

59%

of foreign affiliate jobs

Employment within Texas, 2020

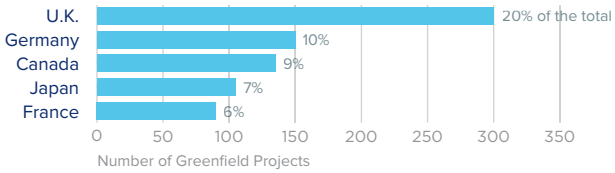
Country	Employment
United Kingdom	114,000
Japan	74,300
Germany	61,100
Canada	60,800
France	60,400

On a country basis, U.K. companies operating in Texas represented 17% of total foreign affiliate employment in Texas, with U.K. multinationals supporting approximately 18,200 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



1,502

Greenfield Projects (July 2011 - June 2021)

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Trade

Texas Goods Exports to Europe, 2021

$63.0 bn

Oil and gas exports to Europe have soared in recent years, due to the shale revolution in the Permian Basin and the opening up of U.S. export markets.

Texas Goods Imports from Europe, 2021

$46.7 bn

Transportation equipment and petroleum & coal are the top product imports, though total imports are relatively diverse with chemicals and machinery also key imports.

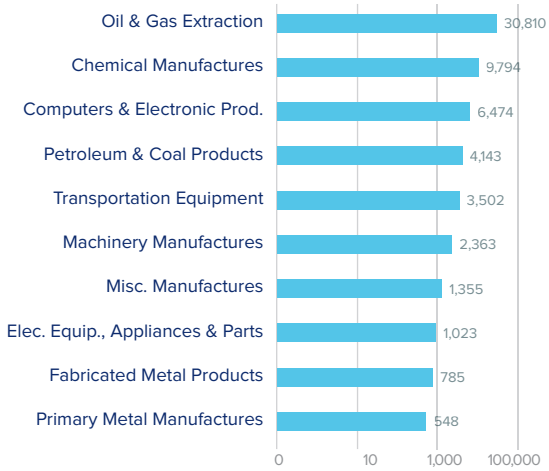
Top European Export Markets, 2021

Country	Exports ($ millions)
Netherlands	13,071
United Kingdom	9,358
Germany	5,888
Belgium	5,605
France	5,168

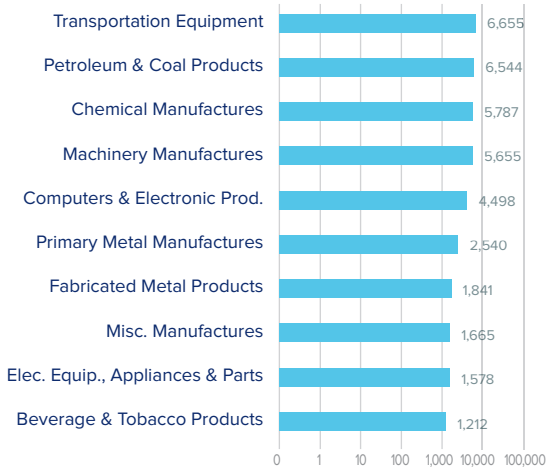
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	7,989
Russia	5,301
Italy	4,499
United Kingdom	4,477
France	3,601

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Utah and Europe

Jobs

35,100

Since 2012: +10,100 (+40.4%)

European companies account for

65%

of foreign affiliate jobs

Employment within Utah, 2020

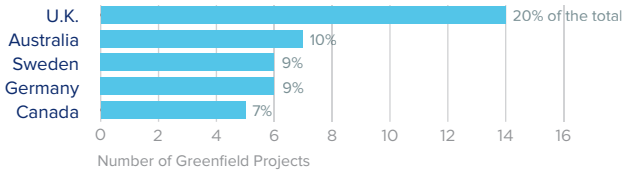
Country	Employment
United Kingdom	10,400
Germany	6,400
France	5,500
Canada	4,500
Switzerland	4,000

On a country basis, U.K. companies operating in Utah represented 19% of total foreign affiliate employment in Utah, with U.K. multinationals supporting approximately 3,200 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Utah Goods Exports to Europe, 2021

$10.8 bn

Primary metals dominate the state's exports to Europe, representing almost 80% of Utah's total exports.

Utah Goods Imports from Europe, 2021

$1.9 bn

Imports are much more diversified than exports. Machinery, computers & electronic products and chemicals are the state's top imports from Europe.

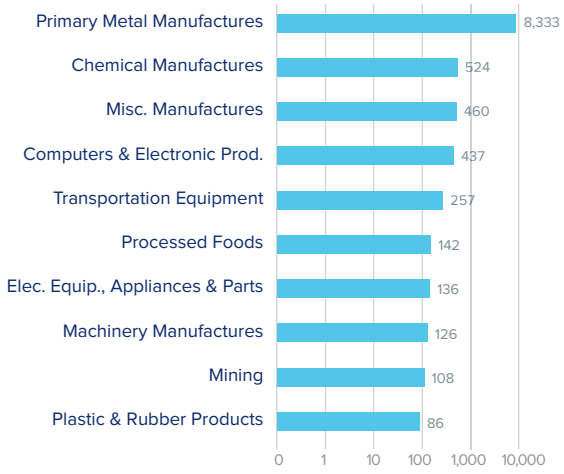
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	8,540
Netherlands	561
Germany	346
France	290
Italy	189

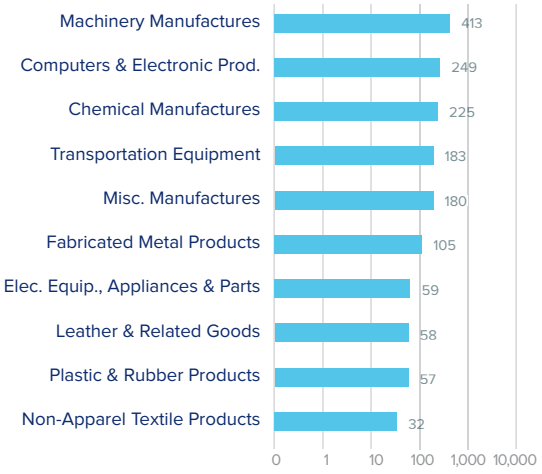
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	357
France	225
Italy	179
United Kingdom	163
Netherlands	135

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Vermont and Europe

Jobs

10,200

Since 2012: +2,000 (+24.4%)

European companies account for

67%

of foreign affiliate jobs

Employment within Vermont, 2020

Country	Employment
Netherlands	3,750
France	2,000
United Kingdom	1,750
Canada	1,700
Germany	800

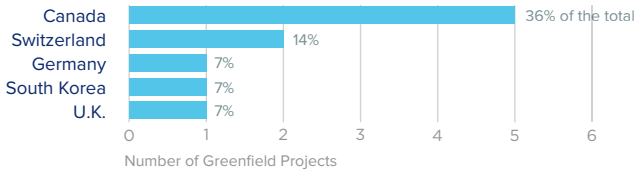
On a country basis, Dutch companies operating in Vermont represented 25% of total foreign affiliate employment in Vermont, with Dutch multinationals supporting approximately 2,950 more jobs in 2020 than in 2012.

*Netherlands and U.K. employment data suppressed to avoid disclosure of individual company data. Range of 2,500 - 4,999 employees given for the Netherlands; 500-999 employees for the U.K.)

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



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Greenfield Projects (July 2011 - June 2021)

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Trade

Vermont Goods Exports to Europe, 2021

$445.3 mn

Over 30% of exports consist of miscellaneous manufactures.

Vermont Goods Imports from Europe, 2021

$449.0 mn

Fabricated metal products are the state's the top import from Europe, representing roughly 27% of the total goods imported.

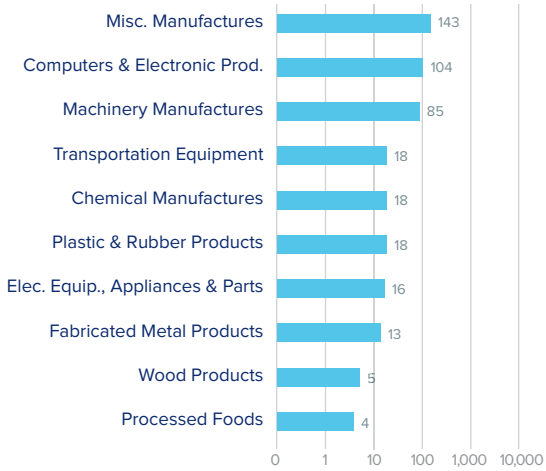
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	111
United Kingdom	80
Netherlands	79
France	46
Ireland	30

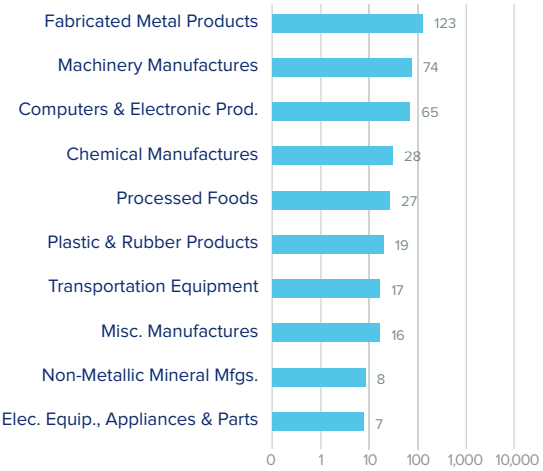
Top European Import Markets, 2021

Country	Imports ($ millions)
Turkey	81
Germany	76
France	46
United Kingdom	42
Russia	35

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Virginia and Europe

Jobs

149,100

Since 2012: +29,700 (+24.9%)

European companies account for

76%

of foreign affiliate jobs

Employment within Virginia, 2020

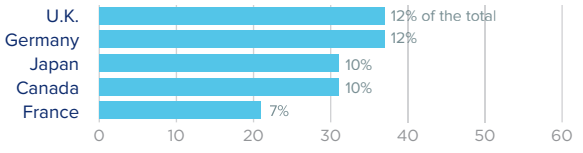
Country	Employment
Netherlands	37,500
United Kingdom	36,800
Germany	23,600
France	18,100
Canada	16,300

On a country basis, Dutch companies operating in Virginia represented 19% of total foreign affiliate employment in Virginia, with Dutch multinationals supporting approximately 21,300 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



306

Greenfield Projects (July 2011 - June 2021)

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Trade

Virginia Goods Exports to Europe, 2021

$5.0 bn

Top exports include mining, chemicals, and transportation equipment.

Virginia Goods Imports from Europe, 2021

$9.4 bn

Machinery is the largest import from Europe, followed by transportation equipment, chemicals, and computers.

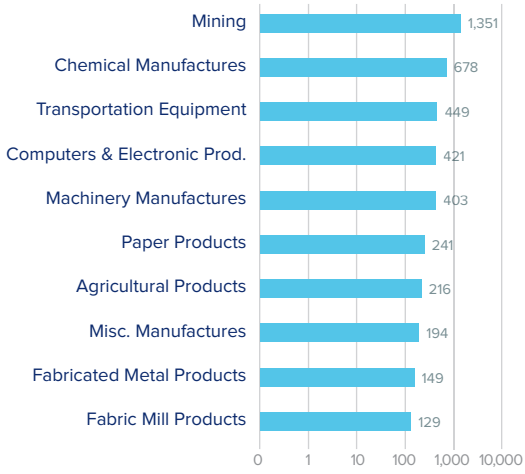
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	766
Netherlands	655
United Kingdom	615
Belgium	515
Italy	287

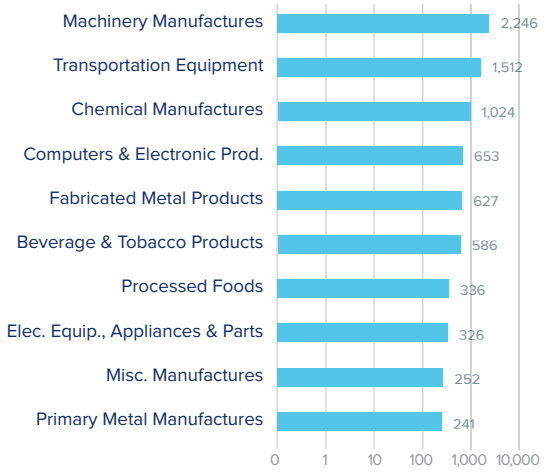
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	2,223
Italy	1,011
United Kingdom	990
Austria	886
France	781

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Washington and Europe

Jobs

80,600

Since 2012: +22,300 (+38.3%)

European companies account for

57%

of foreign affiliate jobs

Employment within Washington, 2020

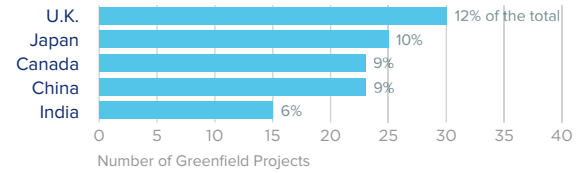
Country	Employment
Canada	28,400
United Kingdom	22,400
Germany	19,400
Japan	14,700
France	10,400

On a country basis, U.K. companies operating in Washington represented 16% of total foreign affiliate employment in Washington, with U.K. multinationals supporting approximately 7,500 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



253

Greenfield Projects (July 2011 - June 2021)

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Trade

Washington Goods Exports to Europe, 2021

$9.6 bn

Transportation equipment dominates Washington's exports to Europe, making up over 60% of total exports.

Washington Goods Imports from Europe, 2021

$5.9 bn

Imports from Europe are less concentrated than exports. The state's top import, oil & gas extraction, makes up only 14% of total goods imports from Europe.

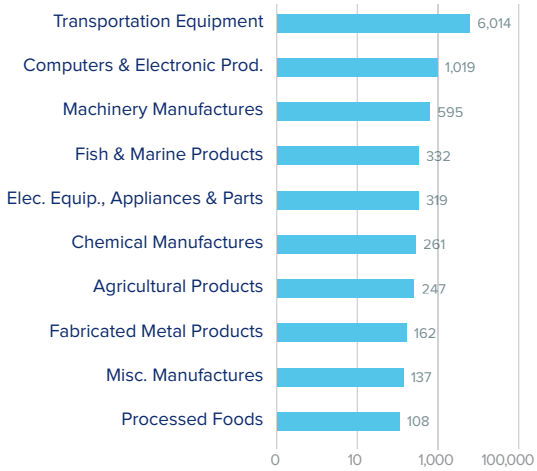
Top European Export Markets, 2021

Country	Exports ($ millions)
United Kingdom	1,820
Ireland	1,509
Germany	1,266
Netherlands	1,201
Turkey	1,010

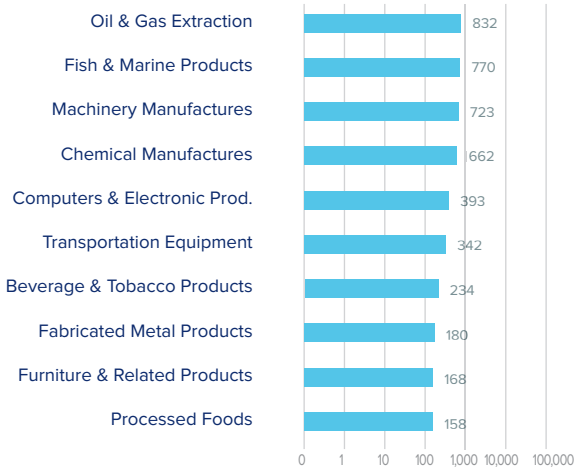
Top European Import Markets, 2021

Country	Imports ($ millions)
Russia	1,836
Germany	910
United Kingdom	545
Italy	521
France	349

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

West Virginia and Europe

Jobs

14,200

Since 2012: -3,000 (-17.4%)

European companies account for **51%** of foreign affiliate jobs

Employment within West Virginia, 2020

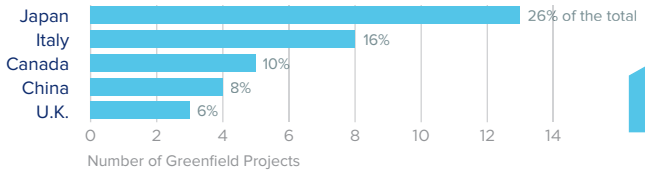
Country	Employment
Canada	5,100
Japan	3,600
France	3,500
Germany	1,900
United Kingdom	1,800

On a country basis, French companies operating in West Virginia represented 13% of total foreign affiliate employment in West Virginia, with French multinationals supporting approximately 2,100 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



50

Greenfield Projects (July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

West Virginia Goods Exports to Europe, 2021

$1.5 bn

Mining products such as minerals and ores accounted for 51% of exports to Europe in 2021.

West Virginia Goods Imports from Europe, 2021

$0.5 bn

Chemicals, machinery and transportation equipment are West Virginia's top imports from Europe.

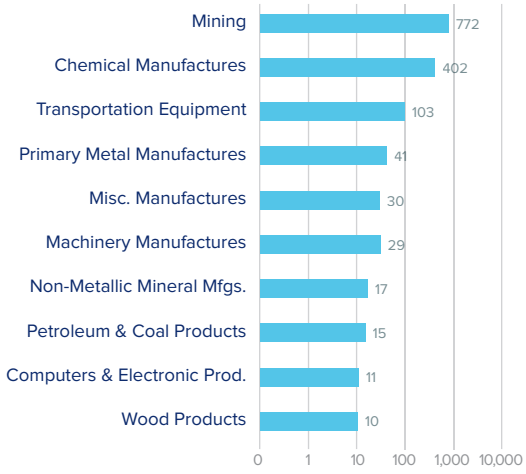
Top European Export Markets, 2021

Country	Exports ($ millions)
Ukraine	372
Netherlands	307
Belgium	243
Germany	168
United Kingdom	89

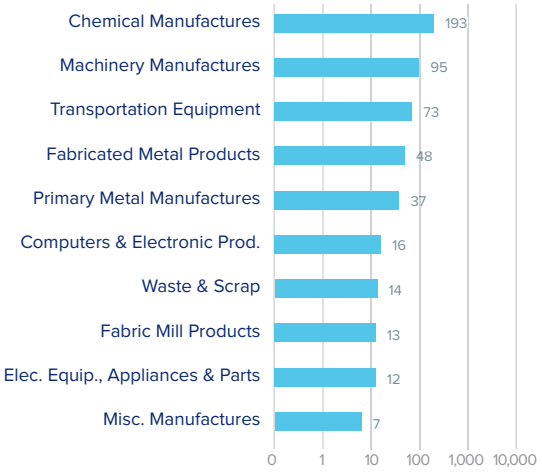
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	171
United Kingdom	76
France	58
Poland	55
Italy	39

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Wisconsin and Europe

Jobs

85,900

Since 2012: +34,400 (+66.8%)

European companies account for

65%

of foreign affiliate jobs

Employment within Wisconsin, 2020

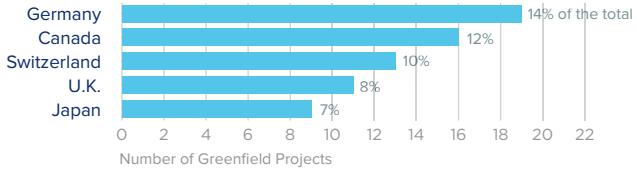
Country	Employment
United Kingdom	22,900
Canada	17,900
Germany	14,600
France	10,700
Switzerland	9,900

On a country basis, U.K. companies operating in Wisconsin represented 17% of total foreign affiliate employment in Wisconsin, with U.K. multinationals supporting approximately 11,200 more jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



134

Greenfield Projects (July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

Wisconsin Goods Exports to Europe, 2021

$4.9 bn

Machinery and chemicals are the state's top exports to Europe.

Wisconsin Goods Imports from Europe, 2021

$11.9 bn

Chemicals and machinery accounted for 46% and 25% of total imports from Europe, respectively.

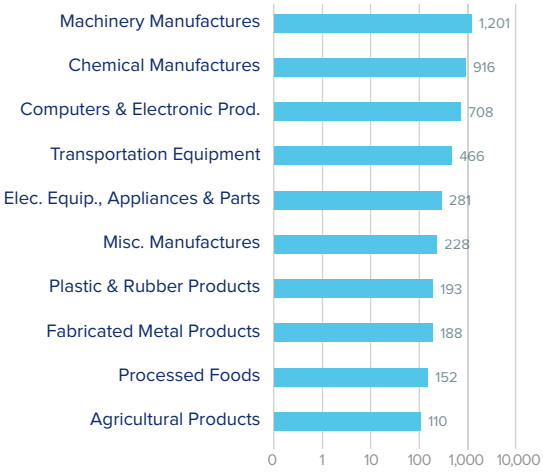
Top European Export Markets, 2021

Country	Exports ($ millions)
Germany	875
United Kingdom	723
Belgium	623
Netherlands	474
France	451

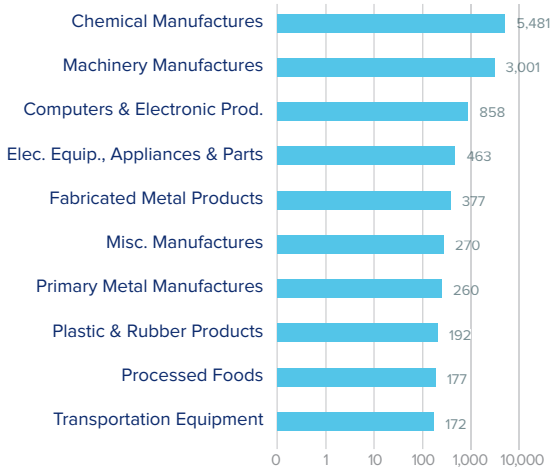
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	3,446
Ireland	2,866
Italy	1,039
Belgium	785
United Kingdom	554

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Wyoming and Europe

Jobs

4,500
Since 2012: -700
(-13.5%)

European companies account for
60%
of foreign affiliate jobs

Employment within Wyoming, 2020

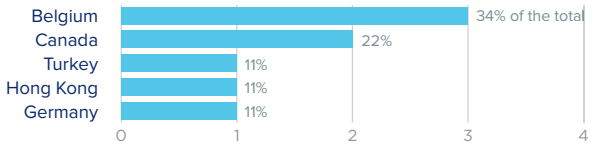
Country	Employment
United Kingdom	1,700
France	900
Canada	700
Japan	300
Switzerland	300

On a country basis, U.K. companies operating in Wyoming represented 23% of total foreign affiliate employment in Wyoming, with U.K. multinationals supporting approximately 600 fewer jobs in 2020 than in 2012.

Jobs directly supported by European investment. Total European-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

Sources of Greenfield Foreign Direct Investment (FDI)



10
Greenfield Projects
(July 2011 - June 2021)

Number of projects does not directly translate to value of projects or jobs added. Greenfield FDI is investment in new assets. Greenfield projects listed on the right hand side are Greenfield projects in the state from all countries.

Trade

Wyoming Goods Exports to Europe, 2021

$44.9 mn

Chemicals accounted for 44% of Wyoming's exports to Europe in 2021.

Wyoming Goods Imports from Europe, 2021

$134.1 mn

Machinery, fabricated metal products and electronics are Wyoming's top imports from Europe.

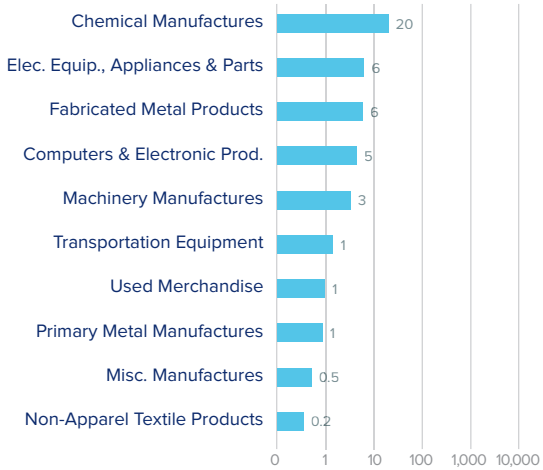
Top European Export Markets, 2021

Country	Exports ($ millions)
Belgium	11
Germany	7
United Kingdom	5
Russia	4
Netherlands	3

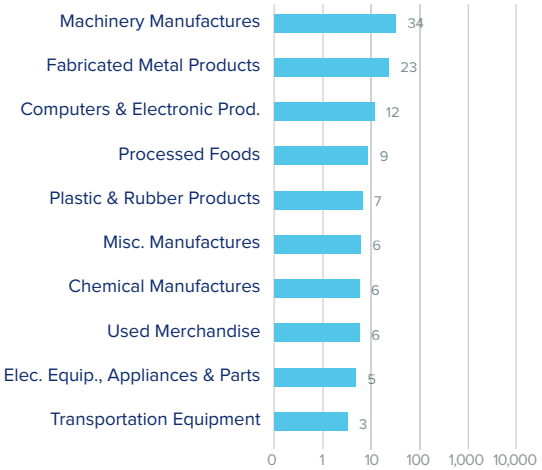
Top European Import Markets, 2021

Country	Imports ($ millions)
Germany	23
Turkey	22
Italy	18
France	14
United Kingdom	8

Top Ten Exports to Europe, 2021 ($ millions)



Top Ten Imports from Europe, 2021 ($ millions)



Sources: Bureau of Economic Analysis; U.S. Census Bureau; U.S. Department of Commerce; SelectUSA.

Appendix B

U.S. Commerce and Europe: A Country-by-Country Comparison

Europe & the United States

Jobs

United States in Europe	Europe in the United States
4,802,954	5,008,506

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$4.0 tn

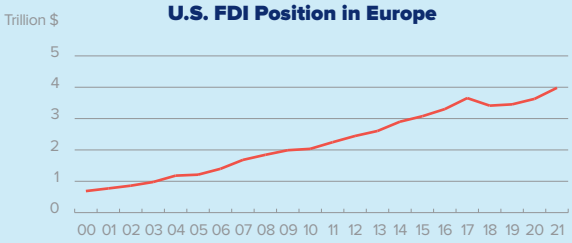
Foreign Direct Investment (FDI), 2021

$3.2 tn

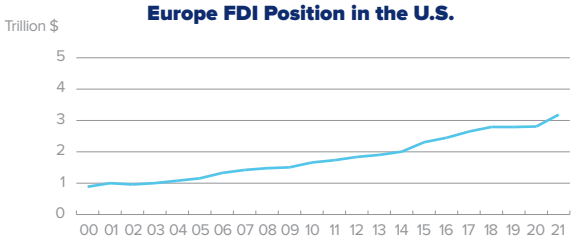
Foreign Direct Investment (FDI), 2021

In terms of the U.S.-Europe investment balance, the U.S. had a larger net cross-border impact in 2021. U.S. foreign direct investment in Europe increased in 2021 to $4 trillion. Europe's foreign direct investment in the U.S. rose to over $3 trillion. According to estimates for 2021, U.S. affiliates employed over 4.8 million workers in Europe while European affiliates employed about 5 million Americans.

U.S. FDI Position in Europe



Europe FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

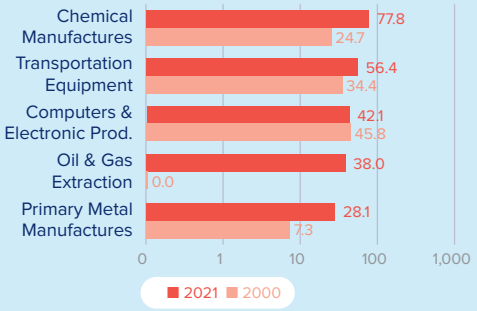
$386.0 bn

U.S. Goods Exports to Europe, 2021

4.8% The U.S. supplied 4.8% of the Europe's total imports...

15.7% ...but the U.S. share increases to 15.7% when intra-Europe trade is excluded from the total.

Top Five U.S. Goods Exports to Europe ($ billions)



Top State Exporters of Goods to Europe ($ billions)

1	2	3	4	5
63.0	35.1	29.1	16.0	14.2
Texas	California	New York	New Jersey	Illinois

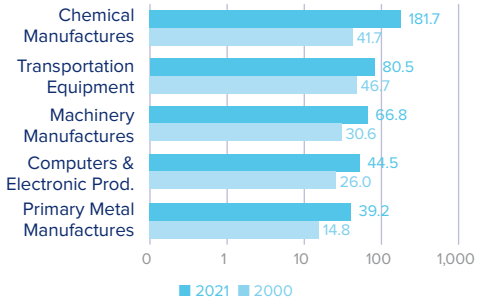
$669.3 bn

U.S. Goods Imports from Europe, 2021

7.5% The U.S. received 7.5% of the total goods Europe exported to the world...

25.7% ...but the U.S. share increases to 25.7% when intra-Europe trade is excluded from the total.

Top Five U.S. Goods Imports from Europe ($ billions)



Top State Importers of Goods from Europe ($ billions)

1	2	3	4	5
72.3	51.3	46.7	45.7	38.1
New Jersey	New York	Texas	California	Illinois

Trade in Services

$331.5 bn

U.S. Services Exports to Europe, 2021

$230.1 bn

U.S. Services Imports from Europe, 2021

"Europe" refers to all 27 members of the European Union in 2020 plus Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Gibraltar, Greenland, Iceland, Kazakhstan, Kosovo, Kyrgyzstan, North Macedonia, Malta, Moldova, Monaco, Montenegro, Norway, Russia, Serbia, San Marino, Switzerland, Turkey, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan, Vatican.

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

The EU+UK & the United States

Jobs

United States in the EU+UK	The EU+UK in the United States
4,336,031	4,487,818

Jobs directly supported by majority-owned affiliates. Estimates for 2020. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$3.7 tn

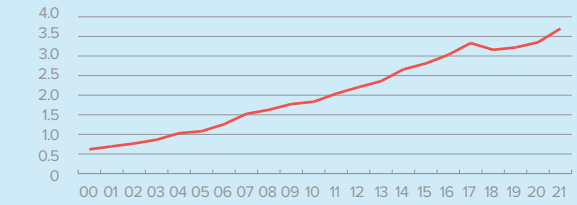
Foreign Direct Investment (FDI), 2021

$2.8 tn

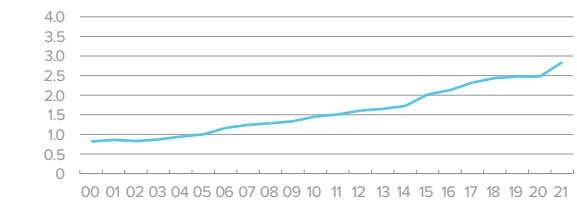
Foreign Direct Investment (FDI), 2021

In terms of the U.S.-EU investment balance, the U.S. had a larger net cross-border impact in 2021. U.S. foreign direct investment in the EU+UK tipped a record $3.7 trillion in 2021, and the EU+UK's foreign direct investment in the U.S. was $2.8 trillion. According to estimates for 2021, U.S. affiliates employed over 4.3 million workers in the EU+UK while EU+UK affiliates employed almost 4.5 million Americans.

U.S. FDI Position in the EU+UK



The EU+UK FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
*The EU FDI trend charts show an increasing number of member countries overtime. The U.K. is included in all years 2000-2019. Prior to 2013 the EU excludes Croatia. Prior to 2007, it also excludes Bulgaria and Romania. Prior to 2004, it also excludes Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

Trade in Goods

$333.1 bn

U.S. Goods Exports to the EU+UK, 2021

4.6% The U.S. supplied 4.6% of the EU+UK's total imports...

11.5% ...but the U.S. share increases to 11.5% when intra-EU+UK trade is excluded from the total.

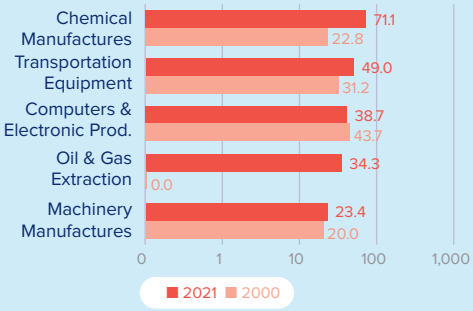
$546.8 bn

U.S. Goods Imports from the EU+UK, 2021

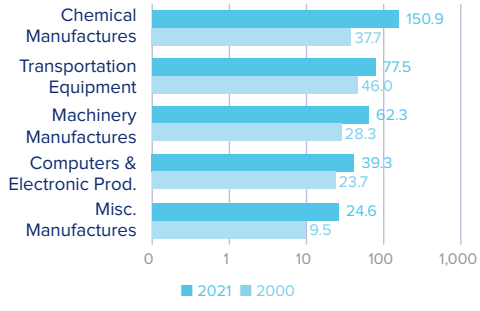
7.5% The U.S. received 7.5% of the total goods the EU+UK exported to the world...

18.9% ...but the U.S. share increases to 18.9% when intra-EU+UK trade is excluded from the total.

Top Five U.S. Goods Exports to the EU+UK ($ billions)



Top Five U.S. Goods Imports from the EU+UK ($ billions)



Top State Exporters of Goods to the EU+UK ($ billions)

1	2	3	4	5
56.2	31.7	16.2	13.8	12.5
Texas	California	New York	New Jersey	Illinois

Top State Importers of Goods from the EU+UK ($ billions)

1	2	3	4	5
51.6	37.2	36.6	34.4	34.0
New Jersey	California	Texas	Illinois	New York

Trade in Services

$269.5 bn

U.S. Services Exports to the EU+UK, 2021

$191.4 bn

U.S. Services Imports from the EU+UK, 2021

"EU 28" refers to all 28 members of the European Union as of 2019 (including the UK). Prior to 2013 it excludes Croatia. Prior to 2007, it also excludes Bulgaria and Romania. Prior to 2004, it also excludes Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.
Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

The EU 27 (excluding U.K.) & the United States

Jobs

United States in the EU (ex. UK)	The EU (ex. UK) in the United States
2,823,354	3,245,866

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$2.7 tn

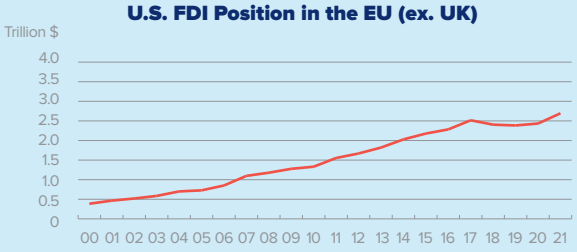
Foreign Direct Investment (FDI), 2021

$2.3 tn

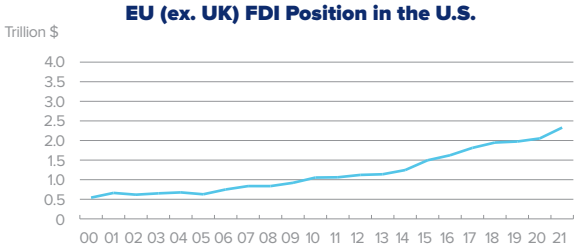
Foreign Direct Investment (FDI), 2021

When the UK is excluded from the EU data, U.S. outward investment is about 25% lower than the EU28 figure. U.S. outward FDI to the EU27 (which excludes the U.K.) in 2021 was $2.7 trillion, supporting 2.8 million jobs. Inward FDI from the 27 EU member states to the U.S. was a bit lower, $2.3 trillion, but supported more jobs (3.2 million), according to estimates.

U.S. FDI Position in the EU (ex. UK)



EU (ex. UK) FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
*The EU (ex. UK) FDI trend excludes the UK from EU data from 2000-2019. Prior to 2013 it also excludes Croatia. Prior to 2007, it also excludes Bulgaria and Romania. Prior to 2004, it also excludes Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

Trade in Goods

$271.7 bn

U.S. Goods Exports to the EU (ex. UK), 2021

4.2% The U.S. supplied 4.2% of the EU's (ex. UK) total imports...

11.0% ...but the U.S. share increases to 11.0% when intra-EU (ex. UK) trade is excluded from the total.

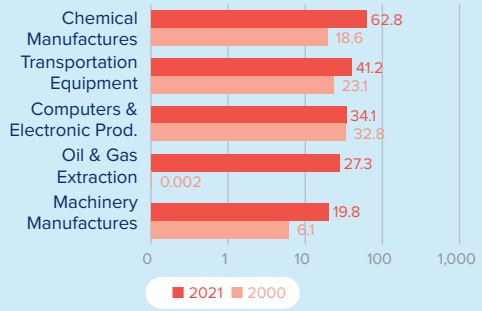
$490.4 bn

U.S. Goods Imports from the EU (ex. UK), 2021

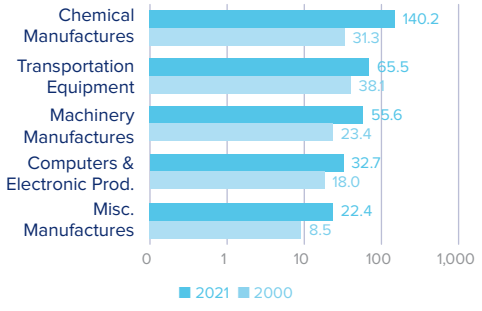
7.1% The U.S. received 7.1% of the total goods the EU (ex. UK) exported to the world...

18.2% ...but the U.S. share increases to 18.2% when intra-EU (ex. UK) trade is excluded from the total.

Top Five U.S. Goods Exports to the EU (ex. UK) ($ billions)



Top Five U.S. Goods Imports from the EU (ex. UK) ($ billions)



Top State Exporters of Goods to the EU (ex. UK) ($ billions)

1	2	3	4	5
46.9	27.4	12.4	9.9	9.5
Texas	California	New York	Illinois	New Jersey

Top State Importers of Goods from the EU (ex. UK) ($ billions)

1	2	3	4	5
43.7	33.3	32.1	31.7	30.9
New Jersey	California	Texas	Illinois	Indiana

Trade in Services

$201.7 bn

U.S. Services Exports to the EU (ex. UK), 2020

$130.3 bn

U.S. Services Imports from the EU (ex. UK), 2020

"The EU 27 (ex. UK)" refers to the 27 members of the European Union as of January 31, 2020 (without the United Kingdom).
Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Austria and the United States

Jobs

United States in Austria	Austria in the United States
29,189	32,538

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$4.6 bn

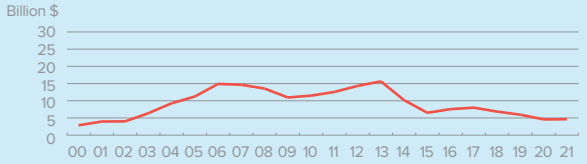
Foreign Direct Investment (FDI), 2021

$16.2 bn

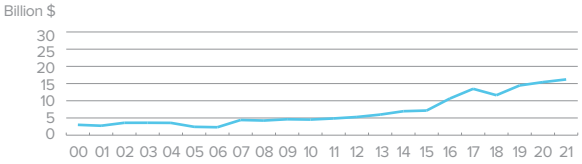
Foreign Direct Investment (FDI), 2021

America's direct investment position in Austria has declined since hitting a peak in 2013. Austria's investment stake in the U.S. now exceeds America's investment in Austria. However, American affiliates employed more workers in Austria than Austrian firms employed in the U.S. in 2021.

U.S. FDI Position in Austria



Austria FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$3.9 bn

U.S. Goods Exports to Austria, 2021

1.8% The U.S. supplied 1.8% of Austria's total imports...

7.5% ...but the U.S. share increases to 7.5% when intra-EU trade is excluded from the total.

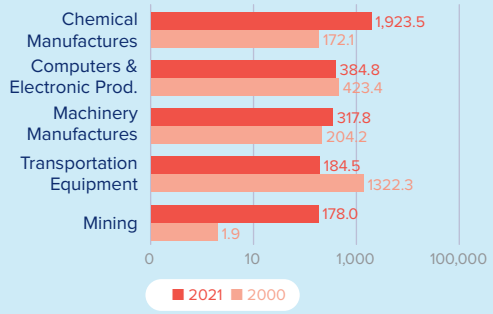
$15.1 bn

U.S. Goods Imports from Austria, 2021

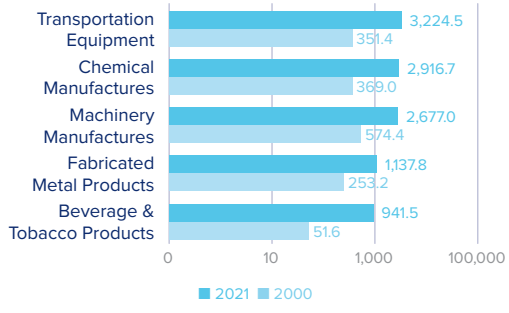
6.3% The U.S. received 6.3% of the total goods Austria exported to the world...

20.3% ...but the U.S. share increases to 20.3% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Austria ($ millions)



Top Five U.S. Goods Imports from Austria ($ millions)



Top State Exporters of Goods to Austria ($ millions)

1	2	3	4	5
744.5 Kentucky	508.3 North Carolina	321.0 California	194.3 Alabama	189.4 Massachusetts

Top State Importers of Goods from Austria ($ millions)

1	2	3	4	5
1,837.5 New Jersey	1,494.5 Georgia	1,328.1 California	1,262.6 South Carolina	941.8 Texas

Trade in Services

$1.1 bn

U.S. Services Exports to Austria, 2021

$0.9 bn

U.S. Services Imports from Austria, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Belgium and the United States

Jobs

United States in Belgium	Belgium in the United States
118,271	76,092

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$61.9 bn

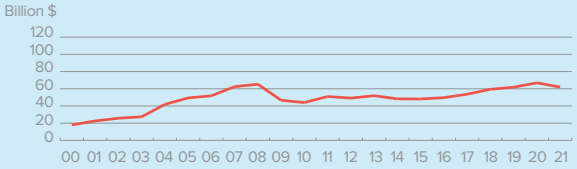
Foreign Direct Investment (FDI), 2021

$71.6 bn

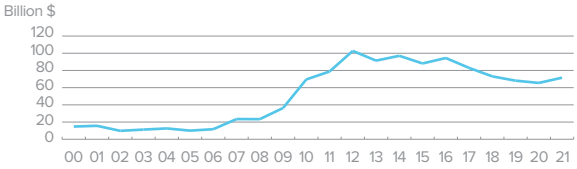
Foreign Direct Investment (FDI), 2021

U.S. direct investments in Belgium are heavily concentrated in the manufacturing sector, which makes up 47% of U.S. FDI in Belgium. Meanwhile, the manufacturing sector accounts for 86% of Belgium's FDI stock in the U.S. Foreign affiliate employment by U.S. companies in Belgium was almost double Belgian companies' employment in the U.S. Value added by U.S. affiliates in Belgium was an estimated $29 billion in 2021, more than double of value added of Belgian affiliates in the U.S.

U.S. FDI Position in Belgium



Belgium FDI Position in the U.S.



FDI position based on a historic-cost basis, 2000-2020.

Trade in Goods

$33.7 bn

U.S. Goods Exports to Belgium, 2021

6.2% The U.S. supplied 6.2% of Belgium's total imports...

16.7% ...but the U.S. share increases to 16.7% when intra-EU trade is excluded from the total.

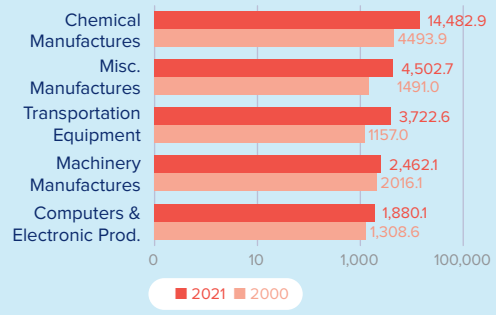
$21.0 bn

U.S. Goods Imports from Belgium, 2021

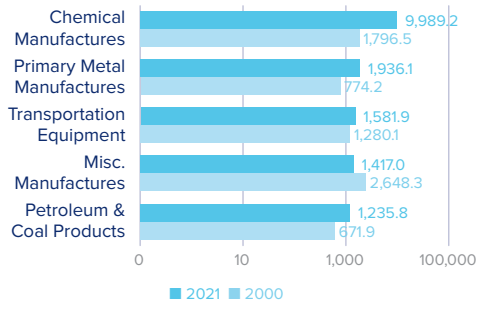
5.9% The U.S. received 5.9% of the total goods Belgium exported to the world...

17.9% ...but the U.S. share increases to 17.9% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Belgium ($ millions)



Top Five U.S. Goods Imports from Belgium ($ millions)



Top State Exporters of Goods to Belgium ($ millions)

1	2	3	4	5
5,605.2 Texas	3,708.8 California	2,439.9 New York	1,804.1 Tennessee	1,486.1 South Carolina

Top State Importers of Goods from Belgium ($ millions)

1	2	3	4	5
3,038.9 Pennsylvania	3,010.7 New York	2,396.5 Georgia	2,367.3 New Jersey	1,033.7 Texas

Trade in Services

$3.8 bn

U.S. Services Exports to Belgium, 2021

$4.7 bn

U.S. Services Imports from Belgium, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Bulgaria and the United States

Jobs

United States in Bulgaria	Bulgaria in the United States
10,605	306

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.2 bn

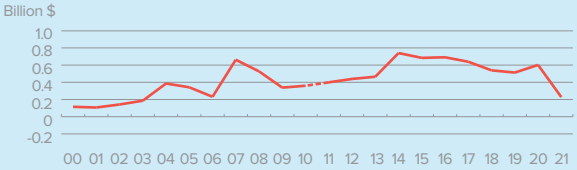
Foreign Direct Investment (FDI), 2021

$0.05 bn

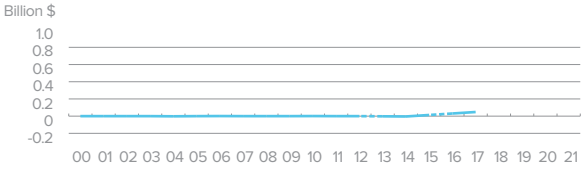
Foreign Direct Investment (FDI), 2017*

America's investment base in Bulgaria is relatively small, and foreign affiliate sales totaled just $2.3 billion in 2021, according to estimates. U.S. affiliates in Bulgaria employed over 10,000 workers in 2021, significantly more than Bulgarian firms employed in the U.S.

U.S. FDI Position in Bulgaria



Bulgaria FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data.

Trade in Goods

$0.3 bn

U.S. Goods Exports to Bulgaria, 2021

0.7% The U.S. supplied 0.7% of Bulgaria's total imports...

1.8% ...but the U.S. share increases to 1.8% when intra-EU trade is excluded from the total.

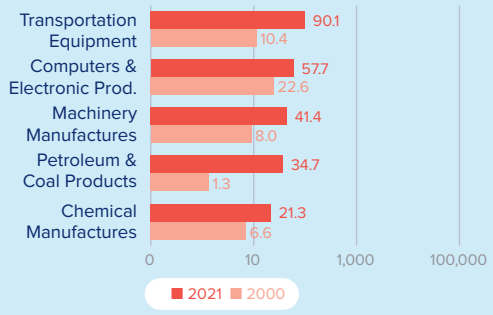
$1.2 bn

U.S. Goods Imports from Bulgaria, 2021

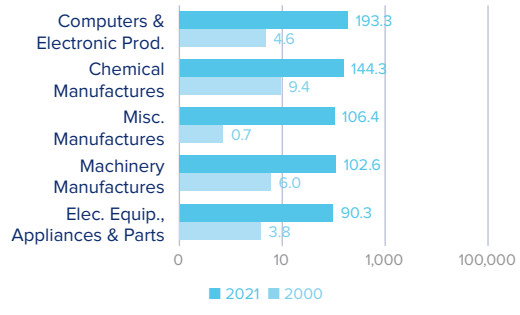
2.5% The U.S. received 2.5% of the total goods Bulgaria exported to the world...

7.3% ...but the U.S. share increases to 7.3% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Bulgaria ($ millions)



Top Five U.S. Goods Imports from Bulgaria ($ millions)



Top State Exporters of Goods to Bulgaria ($ millions)

1	2	3	4	5
55.2 Texas	35.2 California	32.9 Florida	22.8 Alabama	21.1 Maine

Top State Importers of Goods from Bulgaria ($ millions)

1	2	3	4	5
111.5 Massachu-setts	91.8 California	74.5 North Carolina	68.8 New York	68.1 Missouri

Trade in Services

$0.3 bn

U.S. Services Exports to Bulgaria, 2021

$0.4 bn

U.S. Services Imports from Bulgaria, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Croatia and the United States

Jobs

United States in Croatia	Croatia in the United States
2,626	< 51

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.2 bn

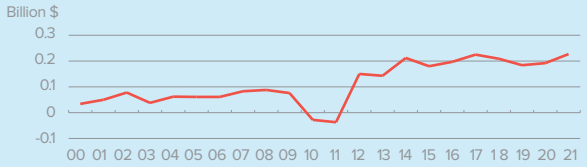
Foreign Direct Investment (FDI), 2021

$0.00 bn

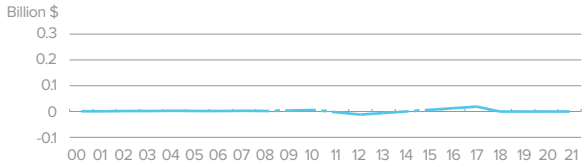
Foreign Direct Investment (FDI), 2019*

U.S. direct investment in Croatia has fluctuated in recent years around $225 million. Meanwhile, Croatia's direct investment position in the U.S. is much lower. U.S. foreign affiliates in Croatia employed over 2,600 workers in 2021, while Croatian foreign direct investment in the U.S. directly supported fewer than 50 jobs.

U.S. FDI Position in Croatia



Croatia FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.
*Latest year of available data

Trade in Goods

$0.8 bn

U.S. Goods Exports to Croatia, 2021

2.0% The U.S. supplied 2.0% of Croatia's total imports...

7.6% ...but the U.S. share increases to 7.6% when intra-EU trade is excluded from the total.

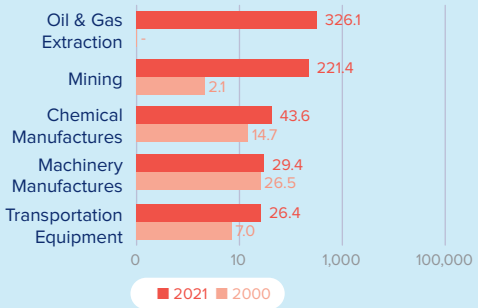
$0.8 bn

U.S. Goods Imports from Croatia, 2021

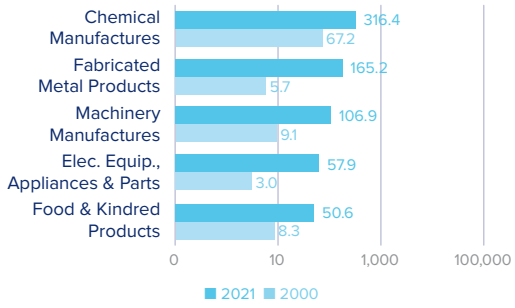
3.2% The U.S. received 3.2% of the total goods Croatia exported to the world...

10.0% ...but the U.S. share increases to 10.0% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Croatia ($ millions)



Top Five U.S. Goods Imports from Croatia ($ millions)



Top State Exporters of Goods to Croatia ($ millions)

1	2	3	4	5
210.0 Virginia	199.3 Texas	143.1 Louisiana	39.4 California	26.2 Illinois

Top State Importers of Goods from Croatia ($ millions)

1	2	3	4	5
224.5 Pennsylvania	156.9 Illinois	54.7 Tennessee	36.1 North Carolina	31.6 New Jersey

Trade in Services

$0.2 bn

U.S. Services Exports to Croatia, 2021

$0.3 bn

U.S. Services Imports from Croatia, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis; United Nations.

Cyprus and the United States

Jobs

United States in Cyprus	Cyprus in the United States
1,818	3,162

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$6.7 bn

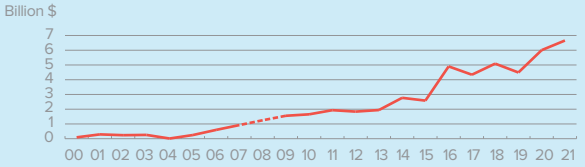
Foreign Direct Investment (FDI), 2021

$0.1 bn

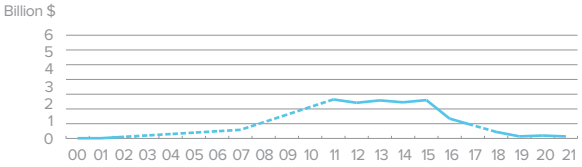
Foreign Direct Investment (FDI), 2021

U.S. investment in Cyprus has risen over the past decade, in part due to the country's relatively low corporate tax rate. In recent years, FDI rose to over $6 billion. Cyprus's FDI in the U.S., meanwhile, has declined over the decade and is near the lowest levels in 20 years. However, Cyprus-based companies continued to support roughly more jobs in the U.S. than American corporations supported in Cyprus.

U.S. FDI Position in Cyprus



Cyprus FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

$0.2 bn

U.S. Goods Exports to Cyprus, 2021

1.3% The U.S. supplied 1.3% of Cyprus's total imports...

3.7% ...but the U.S. share increases to 3.7% when intra-EU trade is excluded from the total.

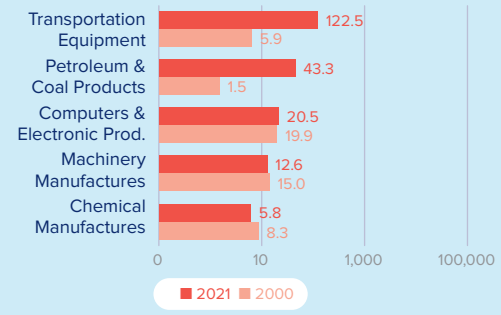
$0.01 bn

U.S. Goods Imports from Cyprus, 2021

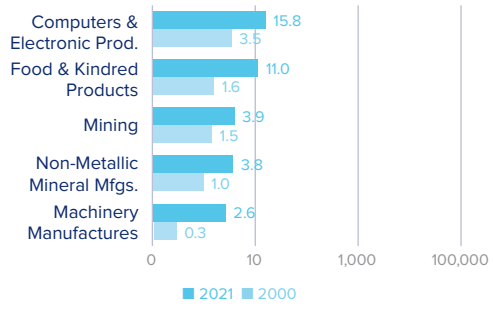
2.3% The U.S. received 2.3% of the total goods Cyprus exported to the world...

3.1% ...but the U.S. share increases to 3.1% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Cyprus ($ millions)



Top Five U.S. Goods Imports from Cyprus ($ millions)



Top State Exporters of Goods to Cyprus ($ millions)

1	2	3	4	5
75.2	58.6	47.9	12.8	8.6
Florida	Texas	Georgia	California	Alabama

Top State Importers of Goods from Cyprus ($ millions)

1	2	3	4	5
15.1	12.5	6.1	5.4	4.8
New York	Idaho	Pennsylvania	Texas	New Jersey

Trade in Services

$1.1 bn

U.S. Services Exports to Cyprus, 2021

$1.6 bn

U.S. Services Imports from Cyprus, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Czech Republic and the United States

Jobs

United States in Czech Republic	Czech Republic in the United States
75,144	3,750

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$5.3 bn

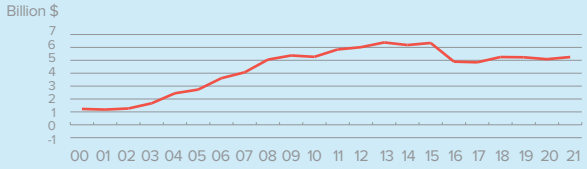
Foreign Direct Investment (FDI), 2021

$0.3 bn

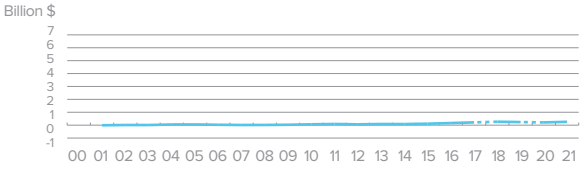
Foreign Direct Investment (FDI), 2021

America's investment base in the Czech Republic has rebounded in recent years from a relative trough of $4.8 billion in 2017 to $ 5.3 billion in 2021. Czech Republic FDI in the U.S. amounted to just $258 million. Similarly, affiliate employment by U.S. multinationals in the Czech Republic was much larger than that of Czech firms in the U.S. Total sales of U.S. foreign affiliates in the Czech Republic were an estimated $14.8 billion in 2021.

U.S. FDI Position in Czech Republic



Czech Republic FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$3.7 bn

U.S. Goods Exports to Czech Republic, 2021

2.1% The U.S. supplied 2.1% of Czech Republic's total imports...

7.8% ...but the U.S. share increases to 7.8% when intra-EU trade is excluded from the total.

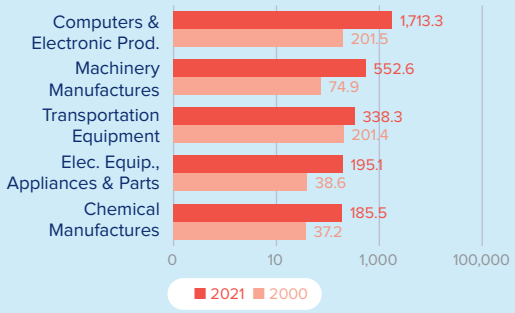
$6.4 bn

U.S. Goods Imports from Czech Republic, 2021

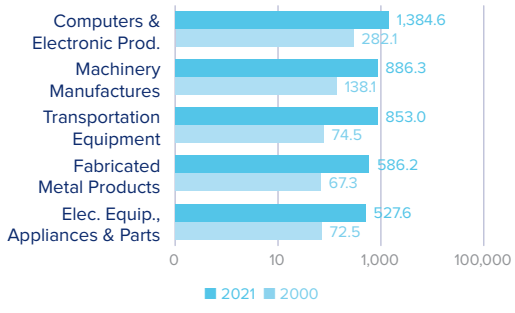
2.3% The U.S. received 2.3% of the total goods Czech Republic exported to the world...

11.8% ...but the U.S. share increases to 11.8% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Czech Republic ($ millions)



Top Five U.S. Goods Imports from Czech Republic ($ millions)



Top State Exporters of Goods to Czech Republic ($ millions)

1	2	3	4	5
1,103.7 Texas	401.7 California	196.4 Florida	190.6 New York	126.9 Wisconsin

Top State Importers of Goods from Czech Republic ($ millions)

1	2	3	4	5
806.1 Texas	537.9 South Carolina	496.7 Pennsylvania	384.5 Ohio	331.2 North Carolina

Trade in Services

$1.0 bn

U.S. Services Exports to Czech Republic, 2021

$1.1 bn

U.S. Services Imports from Czech Republic, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Denmark and the United States

Jobs

United States in Denmark	Denmark in the United States
37,471	46,920

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$16.4 bn

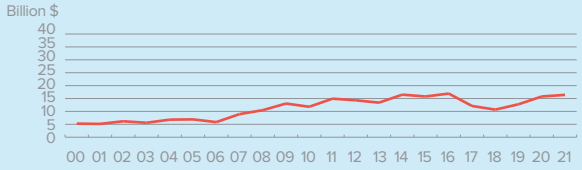
Foreign Direct Investment (FDI), 2021

$34.6 bn

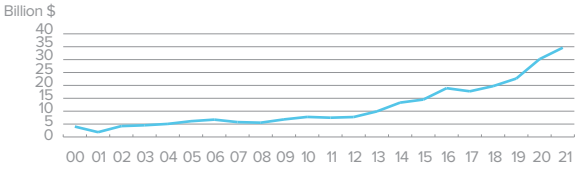
Foreign Direct Investment (FDI), 2021

Bilateral investment between the U.S. and Denmark remains skewed towards the latter, with Denmark's investment position in the U.S. double the U.S. position in Denmark. The investment gap widened again in 2021. Danish firms' affiliate sales in the U.S. market were an estimated $34 billion while U.S. foreign affiliate sales in Denmark were $19 billion. The affiliate employment balance favors Denmark slightly, with U.S. affiliates in Denmark employing roughly 9,000 more people than Danish affiliates employ in the U.S., according to 2021 estimates.

U.S. FDI Position in Denmark



Denmark FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$3.5 bn

U.S. Goods Exports to Denmark, 2021

3.6% The U.S. supplied 3.6% of Denmark's total imports...

11.3% ...but the U.S. share increases to 11.3% when intra-EU trade is excluded from the total.

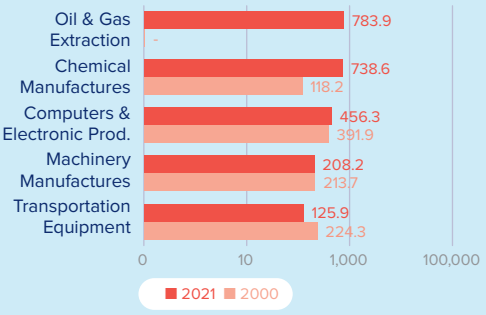
$12.1 bn

U.S. Goods Imports from Denmark, 2021

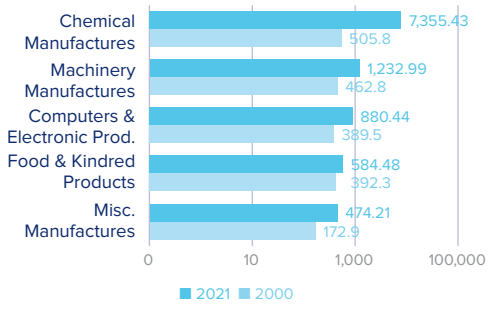
9.3% The U.S. received 9.3% of the total goods Denmark exported to the world...

19.7% ...but the U.S. share increases to 19.7% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Denmark ($ millions)



Top Five U.S. Goods Imports from Denmark ($ millions)



Top State Exporters of Goods to Denmark ($ millions)

1	2	3	4	5
992.8	423.1	210.8	182.2	126.1
Texas	California	North Carolina	Indiana	Louisiana

Top State Importers of Goods from Denmark ($ millions)

1	2	3	4	5
6,213.2	608.7	528.5	482.4	435.6
Indiana	North Carolina	Texas	Illinois	New Jersey

Trade in Services

$9.2 bn

U.S. Services Exports to Denmark, 2021

$9.6 bn

U.S. Services Imports from Denmark, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Estonia and the United States

Jobs

United States in Estonia	Estonia in the United States
3,434	< 51

Jobs directly supported by majority-owned affiliates. Estimates for 2019. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.1 bn

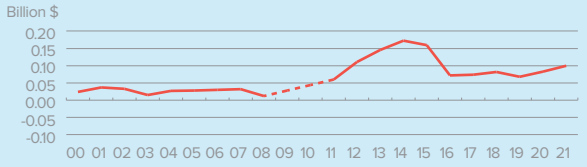
Foreign Direct Investment (FDI), 2021

$0.00 bn

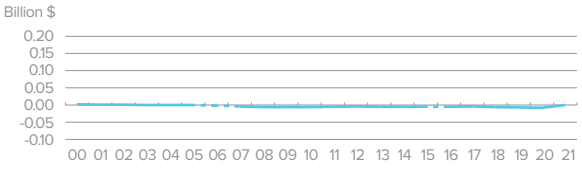
Foreign Direct Investment (FDI), 2020*

America's direct investment base in Estonia is one of the smallest of the European Union. U.S. affiliates employed around 3,400 people in Estonia in 2020, while Estonian firms' provided less than 50 jobs in the U.S., according to estimates. Business conditions are favorable for foreign companies in Estonia, with Estonia's advanced digital economy providing an attractive environment for U.S. companies.

U.S. FDI Position in Estonia



Estonia FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Last year of available data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

$0.4 bn

U.S. Goods Exports to Estonia, 2021

1.5% The U.S. supplied 1.5% of Estonia's total imports...

5.4% ...but the U.S. share increases to 5.4% when intra-EU trade is excluded from the total.

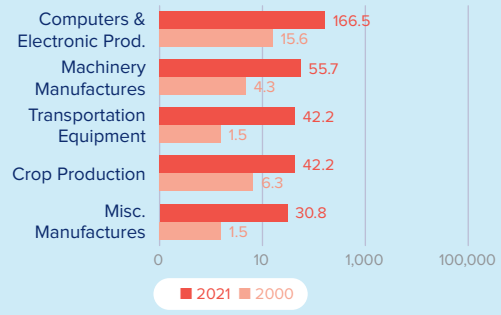
$1.9 bn

U.S. Goods Imports from Estonia, 2021

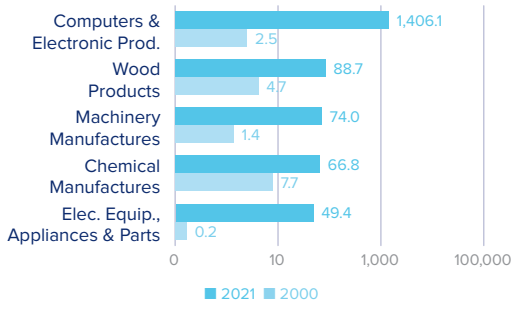
9.2% The U.S. received 9.2% of the total goods Estonia exported to the world...

27.3% ...but the U.S. share increases to 27.3% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Estonia ($ millions)



Top Five U.S. Goods Imports from Estonia ($ millions)



Top State Exporters of Goods to Estonia ($ millions)

1	2	3	4	5
102.4 Texas	87.9 California	28.4 Indiana	20.2 New York	19.1 Nevada

Top State Importers of Goods from Estonia ($ millions)

1	2	3	4	5
1,315.8 Texas	57.2 Ohio	55.2 Kentucky	44.0 South Carolina	40.0 Illinois

Trade in Services

$0.1 bn

U.S. Services Exports to Estonia, 2021

$0.09 bn

U.S. Services Imports from Estonia, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Finland and the United States

Jobs

United States in Finland	Finland in the United States
21,412	36,312

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$6.5 bn

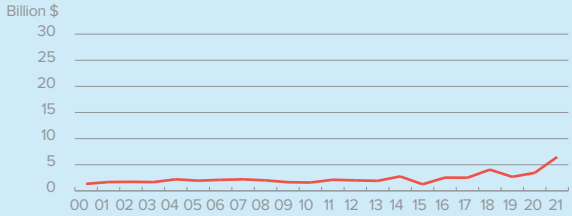
Foreign Direct Investment (FDI), 2021

$10.1 bn

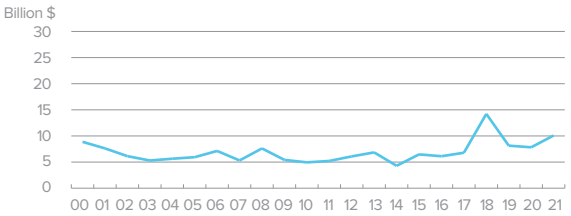
Foreign Direct Investment (FDI), 2021

The direct investment balance favors the United States, with Finnish investment in the U.S. rising again in 2021 to over $10 billion. Total employment by Finnish companies in the U.S. has also risen substantially over the past few years from 23,000 in 2015 to over 36,000 in 2021. Finnish direct investment in the U.S. is heavily concentrated in the wholesale trade and manufacturing industries, representing 21% and 61% of total FDI, respectively.

U.S. FDI Position in Finland



Finland FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$1.7 bn

U.S. Goods Exports to Finland, 2021

1.9% The U.S. supplied 1.9% of Finland's total imports...

6.4% ...but the U.S. share increases to 6.4% when intra-EU trade is excluded from the total.

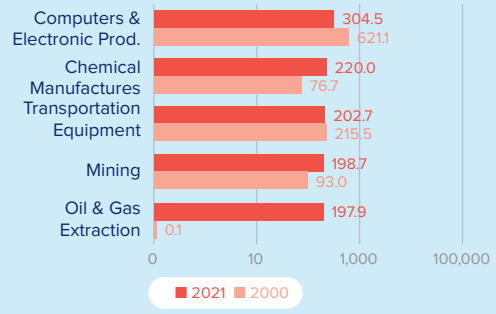
$6.8 bn

U.S. Goods Imports from Finland, 2021

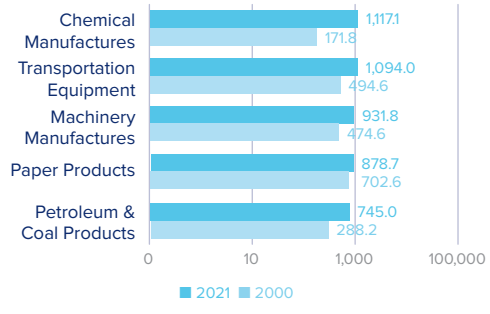
6.9% The U.S. received 6.9% of the total goods Finland exported to the world...

15.6% ...but the U.S. share increases to 15.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Finland ($ millions)



Top Five U.S. Goods Imports from Finland ($ millions)



Top State Exporters of Goods to Finland ($ millions)

1	2	3	4	5
342.5	153.8	96.9	93.1	73.1
Texas	California	Georgia	Illinois	Wisconsin

Top State Importers of Goods from Finland ($ millions)

1	2	3	4	5
785.3	597.7	573.2	566.1	526.6
Pennsylvania	Maryland	California	Illinois	New Jersey

Trade in Services

$1.6 bn

U.S. Services Exports to Finland, 2021

$1.4 bn

U.S. Services Imports from Finland, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

France and the United States

Jobs

United States in France	France in the United States
487,931	754,902

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$106.2 bn

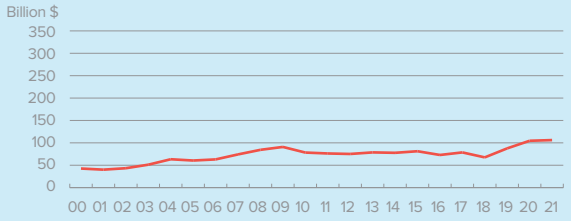
Foreign Direct Investment (FDI), 2021

$276.1 bn

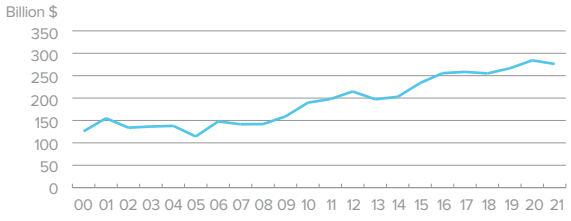
Foreign Direct Investment (FDI), 2021

The direct investment balance favors the U.S., with U.S. investment in France just one-third of the total value of French investment in the U.S. in 2021. The U.S. is a significant market for French firms, with U.S. affiliates of French firms recording an estimated $322 billion in sales during 2021. The manufacturing sector makes up about 52% of French FDI in the U.S. followed by financial institutions & wholesale trade. In terms of jobs, U.S. and French affiliates combined employed an estimated 1.2 million workers in 2021.

U.S. FDI Position in France



France FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$29.9 bn

U.S. Goods Exports to France, 2021

4.4% The U.S. supplied 4.4% of France's total imports...

13.0% ...but the U.S. share increases to 13.0% when intra-EU trade is excluded from the total.

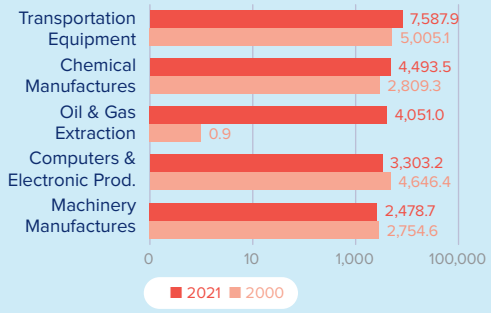
$50.1 bn

U.S. Goods Imports from France, 2021

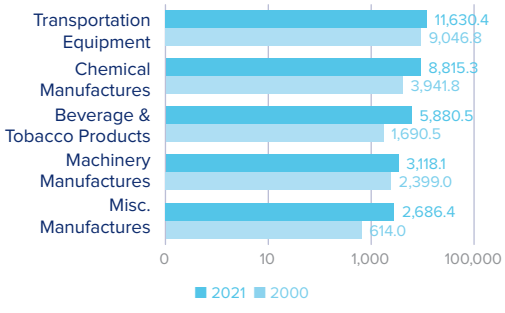
7.1% The U.S. received 7.1% of the total goods France exported to the world...

15.6% ...but the U.S. share increases to 15.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to France ($ millions)



Top Five U.S. Goods Imports from France ($ millions)



Top State Exporters of Goods to France ($ millions)

1	2	3	4	5
5,167.9 Texas	2,196.3 California	2,063.0 New York	1,884.5 Kentucky	1,578.8 Maryland

Top State Importers of Goods from France ($ millions)

1	2	3	4	5
7,602.9 New York	5,038.3 New Jersey	4,063.3 California	3,601.2 Texas	3,334.9 Florida

Trade in Services

$17.2 bn

U.S. Services Exports to France, 2021

$18.4 bn

U.S. Services Imports from France, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Germany and the United States

Jobs

United States in Germany	Germany in the United States
652,965	902,802

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$170.2 bn

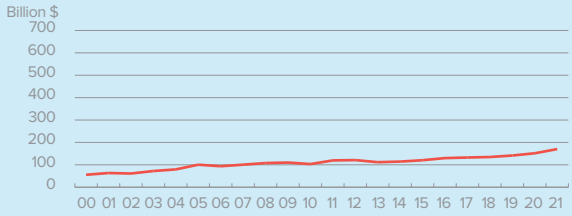
Foreign Direct Investment (FDI), 2021

$403.6 bn

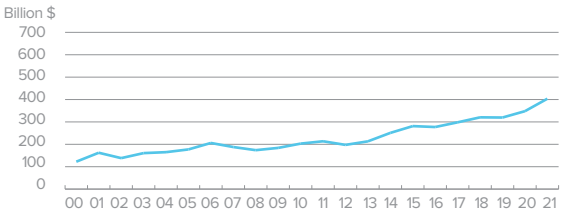
Foreign Direct Investment (FDI), 2021

The investment balance favors the U.S., with Germany's investment in the U.S. more than 2.5 times the size of U.S. investment in Germany. Wholesale trade, finance and insurance, and transportation equipment manufacturing are the largest industries when it comes to German stock of FDI in the U.S. The value added by German affiliates in the United States ($119 billion) was higher than that of U.S. affiliates operating in Germany ($80 billion), according to 2021 estimates. The employment picture is relatively balanced, with affiliates of both countries employing a combined workforce of over 1.5 million employees.

U.S. FDI Position in Germany



Germany FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$65.3 bn

U.S. Goods Exports to Germany, 2021

$135.2 bn

U.S. Goods Imports from Germany, 2021

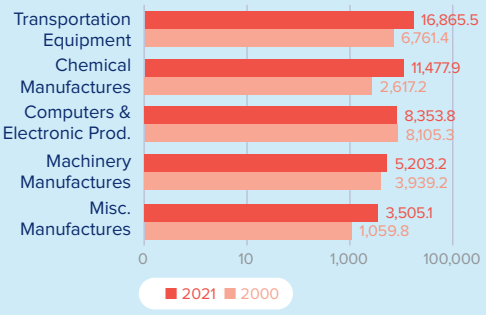
4.5% The U.S. supplied 4.5% of Germany's total imports...

12.3% The U.S. received 8.9% of the total goods Germany exported to the world...

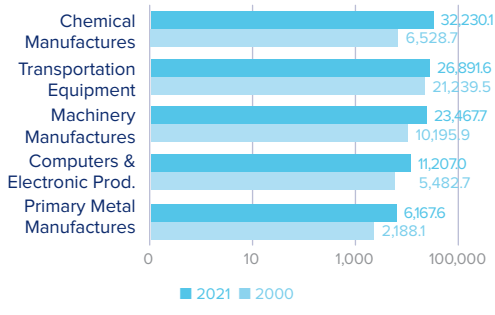
8.9% The U.S. received 8.6% of the total goods Germany exported to the world...

19.4% ...but the U.S. share increases to 19.4% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Germany ($ millions)



Top Five U.S. Goods Imports from Germany ($ millions)



Top State Exporters of Goods to Germany ($ millions)

1	2	3	4	5
7,598.1 California	5,887.8 Texas	4,587.6 South Carolina	3,758.5 Illinois	3,707.4 Alabama

Top State Importers of Goods from Germany ($ millions)

1	2	3	4	5
11,892.7 California	9,647.7 Illinois	8,648.2 Georgia	8,095.4 Pennsylvania	7,989.1 Texas

Trade in Services

$32.0 bn

U.S. Services Exports to Germany, 2021

$34.7 bn

U.S. Services Imports from Germany, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Greece and the United States

Jobs

United States in Greece	Greece in the United States
16,867	3,774

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

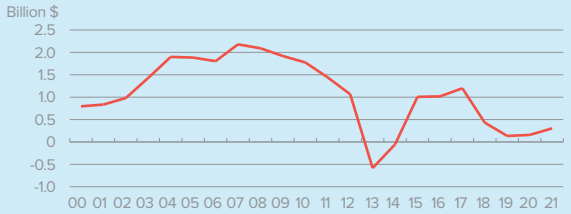
Investment

$0.3 bn

Foreign Direct Investment (FDI), 2021

Greece's investment ties with the U.S. have declined in recent years after rebounding temporarily following the global financial crisis. In 2020, America's foreign direct investment position in Greece was just $300 million, down from a recent peak of $1.2 billion in 2017. Meanwhile, Greece's FDI position in the U.S. has increased in recent years. Estimated U.S. affiliate sales in Greece of $5.8 billion were three times greater than sales of Greek affiliates in the U.S. ($1.9 billion).

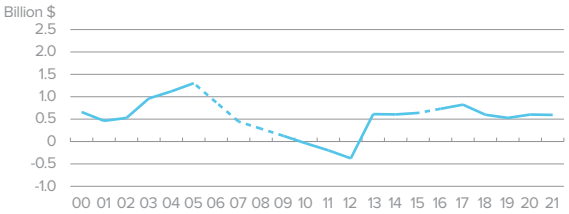
U.S. FDI Position in Greece



$0.6 bn

Foreign Direct Investment (FDI), 2021

Greece FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

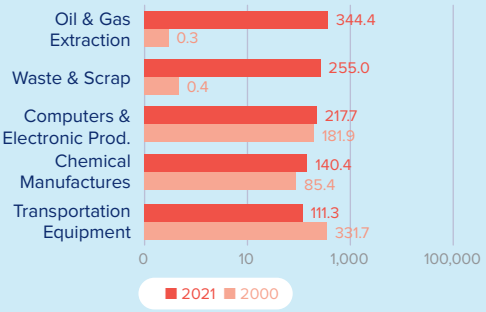
$1.6 bn

U.S. Goods Exports to Greece, 2021

2.2% The U.S. supplied 2.2% of Greece's total imports...

4.4% ...but the U.S. share increases to 4.4% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Greece ($ millions)



Top State Exporters of Goods to Greece ($ millions)

1	2	3	4	5
283.8	249.6	135.7	134.8	71.3
Louisiana	Texas	California	Pennsylvania	New Jersey

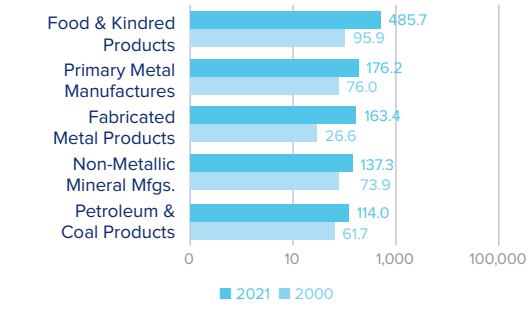
$1.7 bn

U.S. Goods Imports from Greece, 2021

4.1% The U.S. received 4.1% of the total goods Greece exported to the world...

8.8% ...but the U.S. share increases to 8.8% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Imports from Greece ($ millions)



Top State Importers of Goods from Greece ($ millions)

1	2	3	4	5
176.2	170.3	162.3	145.5	126.2
New York	New Jersey	California	North Carolina	Texas

Trade in Services

$1.3 bn

U.S. Services Exports to Greece, 2021

$2.9 bn

U.S. Services Imports from Greece, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Hungary and the United States

Jobs

United States in Hungary	Hungary in the United States
59,186	250

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$11.4 bn

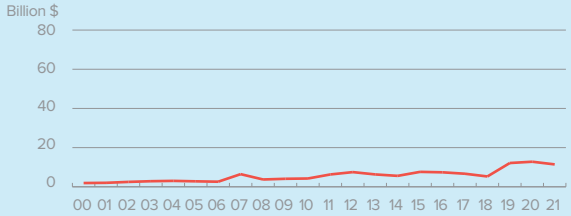
Foreign Direct Investment (FDI), 2021

$45.7 bn

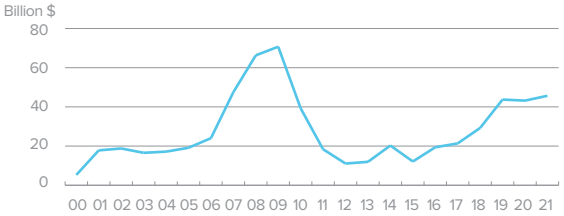
Foreign Direct Investment (FDI), 2021

America's investment base in Hungary was flat in 2020. Value added by U.S.-owned affiliates totaled $3.5 billion in 2021, according to estimates. Meanwhile, Hungarian investment in the U.S. increased slightly in 2021 to over $45 billion, though total investment remains below its peak of $70.7 billion in 2009.

U.S. FDI Position in Hungary



Hungary FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$2.9 bn

U.S. Goods Exports to Hungary, 2021

1.5% The U.S. supplied 1.5% of Hungary's total imports...

5.1% ...but the U.S. share increases to 5.1% when intra-EU trade is excluded from the total.

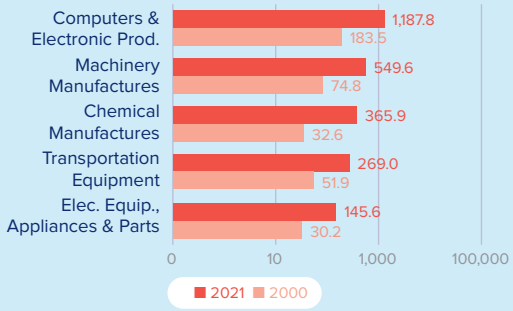
$7.1 bn

U.S. Goods Imports from Hungary, 2021

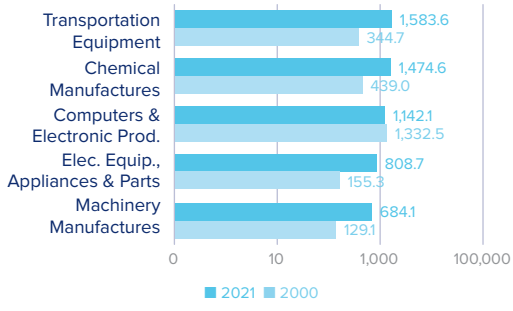
2.7% The U.S. received 2.7% of the total goods Hungary exported to the world...

12.3% ...but the U.S. share increases to 12.3% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Hungary ($ millions)



Top Five U.S. Goods Imports from Hungary ($ millions)



Top State Exporters of Goods to Hungary ($ millions)

1	2	3	4	5
817.6 Texas	264.2 Nevada	237.2 Florida	168.0 Indiana	161.2 California

Top State Importers of Goods from Hungary ($ millions)

1	2	3	4	5
773.7 Illinois	689.7 Ohio	652.5 Michigan	625.0 Texas	549.0 California

Trade in Services

$0.9 bn

U.S. Services Exports to Hungary, 2021

$0.5 bn

U.S. Services Imports from Hungary, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Ireland and the United States

Jobs

United States in Ireland	Ireland in the United States
151,197	343,230

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$556.6 bn

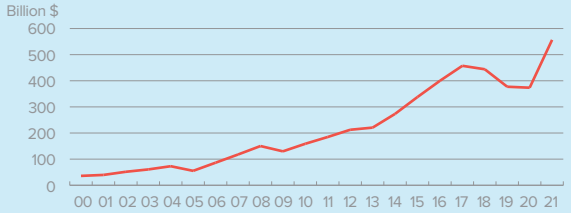
Foreign Direct Investment (FDI), 2021

$269.4 bn

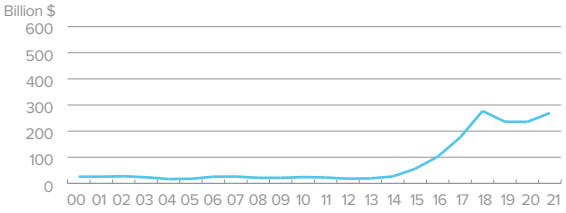
Foreign Direct Investment (FDI), 2021

The investment balance favors Ireland, with U.S. investment in Ireland totaling some $557 billion in 2021 versus $270 billion of Irish investment in the U.S. Total U.S. FDI in Ireland rose in 2021.Value added by U.S. affiliates in Ireland totaled an estimated $125 billion in 2021, which is double the gross product of Irish affiliates operating in the U.S. By contrast, affiliate employment favored the United States, with Ireland's affiliates employing roughly 190,000 more Americans than U.S. affiliates employed in Ireland.

U.S. FDI Position in Ireland



Ireland FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2020.

Trade in Goods

$13.8 bn

U.S. Goods Exports to Ireland, 2021

16.8% The U.S. supplied 16.8% of Ireland's total imports...

26.7% ...but the U.S. share increases to 26.7% when intra-EU trade is excluded from the total.

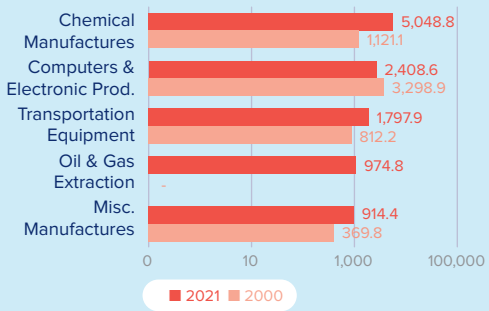
$73.7 bn

U.S. Goods Imports from Ireland, 2021

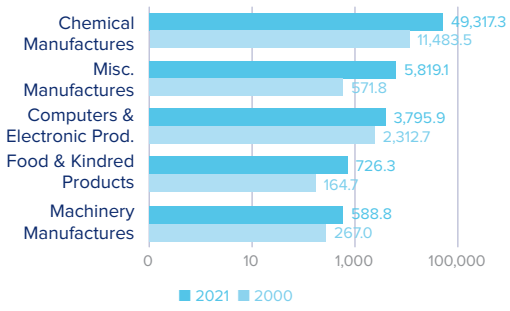
30.8% The U.S. received 30.8% of the total goods Ireland exported to the world...

49.6% ...but the U.S. share increases to 49.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Ireland ($ millions)



Top Five U.S. Goods Imports from Ireland ($ millions)



Top State Exporters of Goods to Ireland ($ millions)

1	2	3	4	5
1,578.2 California	1,509.0 Washington	1,225.1 Texas	966.9 Illinois	923.6 Massachu-setts

Top State Importers of Goods from Ireland ($ millions)

1	2	3	4	5
14,775.9 Indiana	8,792.3 North Carolina	6,473.5 Tennessee	4,491.4 Kentucky	3,270.1 Texas

Trade in Services

$74.8 bn

U.S. Services Exports to Ireland, 2021

$21.3 bn

U.S. Services Imports from Ireland, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis

Italy and the United States

Jobs

United States in Italy	Italy in the United States
246,844	100,674

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$28.1 bn

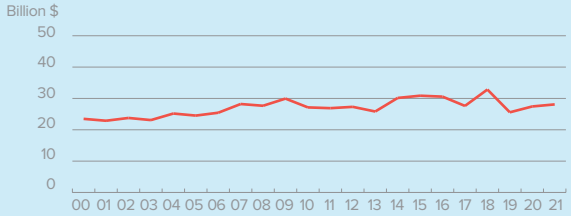
Foreign Direct Investment (FDI), 2021

$34.4 bn

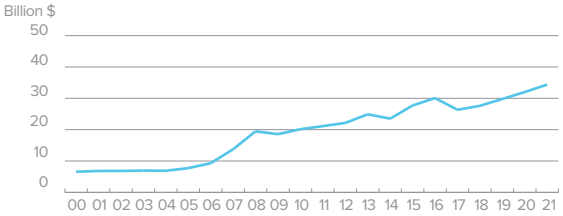
Foreign Direct Investment (FDI), 2021

America's FDI position has been relatively flat over the past two decades, while Italian investment in the U.S. has risen steadily, up almost 400% since 2000. In 2021, Italy benefited more with regards to affiliate sales, value added and employment. For example, value added by U.S. affiliates in Italy was three times the value added of Italian companies in the U.S. Also, affiliates of U.S.-owned companies supported about 150,000 more jobs in Italy than Italian multinationals supported in the U.S., according to 2021 estimates.

U.S. FDI Position in Italy



Italy FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$21.7 billion

U.S. Goods Exports to Italy, 2021

3.3% The U.S. supplied 3.3% of Italy's total imports...

7.6% ...but the U.S. share increases to 7.6% when intra-EU trade is excluded from the total.

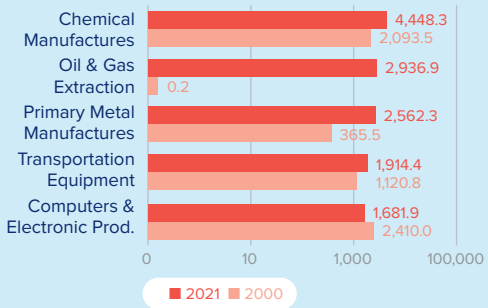
$61.0 bn

U.S. Goods Imports from Italy, 2021

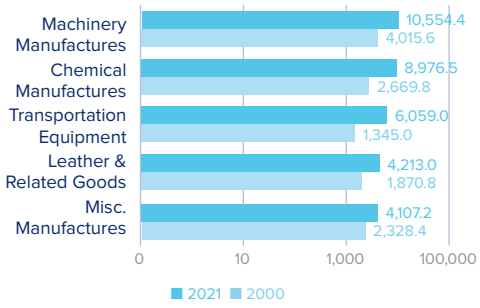
9.5% The U.S. received 9.5% of the total goods Italy exported to the world...

20.0% ...but the U.S. share increases to 20.0% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Italy ($ millions)



Top Five U.S. Goods Imports from Italy ($ millions)



Top State Exporters of Goods to Italy ($ millions)

1	2	3	4	5
4,146.4	2,478.3	1,542.8	921.6	838.9
Texas	New Jersey	California	Indiana	New York

Top State Importers of Goods from Italy ($ millions)

1	2	3	4	5
10,436.4	6,430.0	4,728.5	4,498.9	2,854.0
New Jersey	New York	California	Texas	Pennsylvania

Trade in Services

$6.4 bn

U.S. Services Exports to Italy, 2021

$6.0 bn

U.S. Services Imports from Italy, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Latvia and the United States

Jobs

United States in Latvia	Latvia in the United States
1,818	< 51

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.04 bn

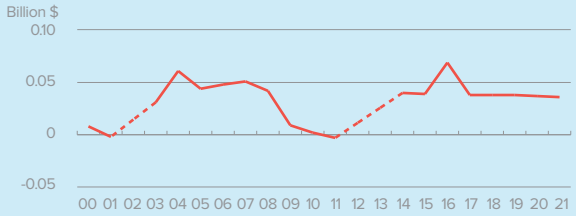
Foreign Direct Investment (FDI), 2021

$0 bn

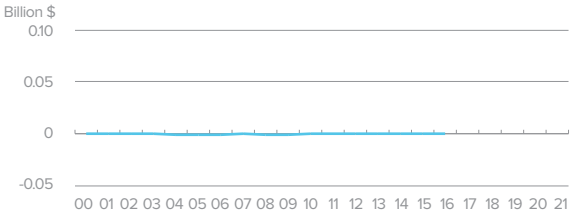
Foreign Direct Investment (FDI), 2016*

The small country of roughly two million people has yet to attract significant foreign direct investment from the United States. U.S. FDI in Latvia has stalled since 2016, along with U.S. affiliate employment which is the second lowest in the EU, ahead of Cyprus. Foreign sales by U.S. firms in Latvia were an estimated $427 million in 2021. By contrast, sales by Latvian firms in the U.S. were just $3 million.

U.S. FDI Position in Latvia



Latvia FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

$0.4 bn

U.S. Goods Exports to Latvia, 2021

0.9% The U.S. supplied 0.9% of Latvia's total imports...

3.4% ...but the U.S. share increases to 3.4% when intra-EU trade is excluded from the total.

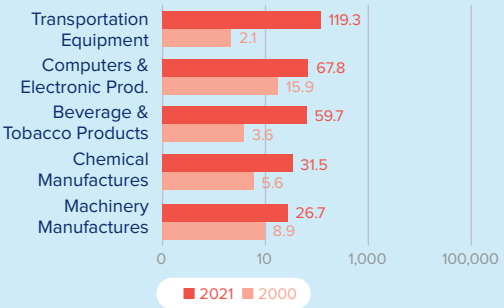
$0.7 bn

U.S. Goods Imports from Latvia, 2021

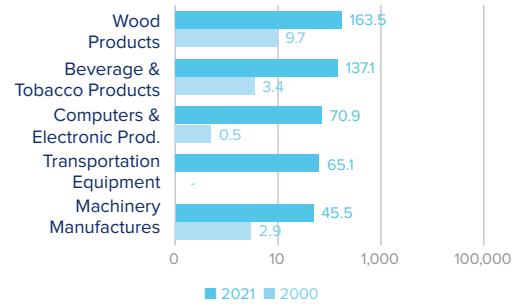
2.2% The U.S. received 2.2% of the total goods Latvia exported to the world...

6.0% ...but the U.S. share increases to 6.0% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Latvia ($ millions)



Top Five U.S. Goods Imports from Latvia ($ millions)



Top State Exporters of Goods to Latvia ($ millions)

1	2	3	4	5
66.6	43.2	42.5	40.9	39.3
Alabama	Tennessee	Texas	New York	California

Top State Importers of Goods from Latvia ($ millions)

1	2	3	4	5
103.8	96.8	53.9	52.7	47.0
Texas	Alabama	Maryland	California	Florida

Trade in Services

$0.1 bn

U.S. Services Exports to Latvia, 2021

$0.08 bn

U.S. Services Imports from Latvia, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Lithuania and the United States

Jobs

United States in Lithuania	Lithuania in the United States
4,949	0

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.2 bn

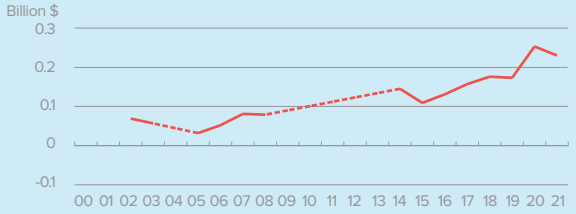
Foreign Direct Investment (FDI), 2021

$0.02 bn

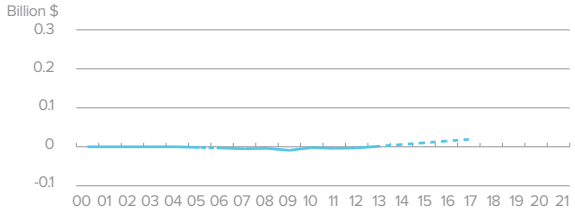
Foreign Direct Investment (FDI), 2017*

The U.S. FDI position in Lithuania remains small, but has more than doubled since the start of the century. U.S. affiliate employment in Lithuania has also been rising, with jobs increasing from 2,200 in 2016 to an estimated 5,000 in 2021. U.S. foreign affiliate sales in Lithuania amounted to $718 million in 2021, with real value added by U.S. affiliates coming in at $417 million, according to estimates. *Latest year of available data.

U.S. FDI Position in Lithuania



Lithuania FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

$1.2 bn

U.S. Goods Exports to Lithuania, 2021

2.5% The U.S. supplied 2.5% of Lithuania's total imports...

7.9% ...but the U.S. share increases to 7.9% when intra-EU trade is excluded from the total.

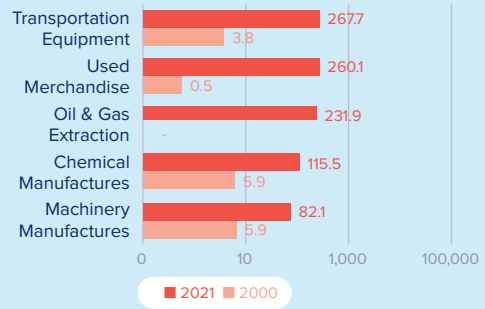
$2.1 bn

U.S. Goods Imports from Lithuania, 2021

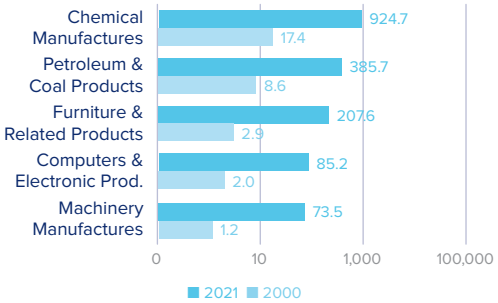
6.3% The U.S. received 6.3% of the total goods Lithuania exported to the world...

14.7% ...but the U.S. share increases to 14.7% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Lithuania ($ millions)



Top Five U.S. Goods Imports from Lithuania ($ millions)



Top State Exporters of Goods to Lithuania ($ millions)

1	2	3	4	5
223.3 Texas	152.3 California	108.2 New York	100.5 New Jersey	90.5 Georgia

Top State Importers of Goods from Lithuania ($ millions)

1	2	3	4	5
461.8 Maryland	244.1 California	180.9 Massachu-setts	138.1 Louisiana	135.1 New Jersey

Trade in Services

$0.2 bn

U.S. Services Exports to Lithuania, 2021

$0.1 bn

U.S. Services Imports from Lithuania, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis; United Nations.

Luxembourg and the United States

Jobs

United States in Luxembourg	Luxembourg in the United States
24,745	40,290

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$715.6 bn

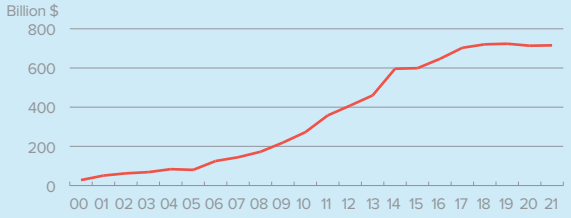
Foreign Direct Investment (FDI), 2021

$382.9 bn

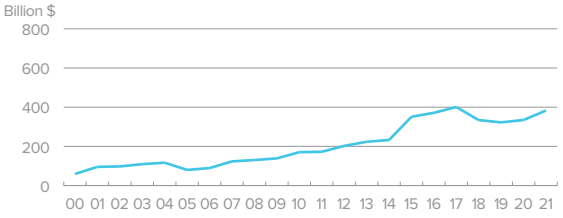
Foreign Direct Investment (FDI), 2021

Investment between the U.S. and Luxembourg is skewed in favor of Luxembourg. Estimated U.S. foreign affiliate sales in Luxembourg were about six times greater than sales of Luxembourg affiliates in the U.S. Foreign direct investment and employment by Luxembourg firms in the U.S. have fluctuated over the past decade. In 2010 employment was at a peak of 38,300 workers, then fell to as low as 5,200 workers in 2016, and has since recovered to an estimated 40,290 workers in 2021.

U.S. FDI Position in Luxembourg



Luxembourg FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$1.5 bn

U.S. Goods Exports to Luxembourg, 2021

3.3% The U.S. supplied 3.3% of Luxembourg's total imports...

29.6% ...but the U.S. share increases to 29.6% when intra-EU trade is excluded from the total.

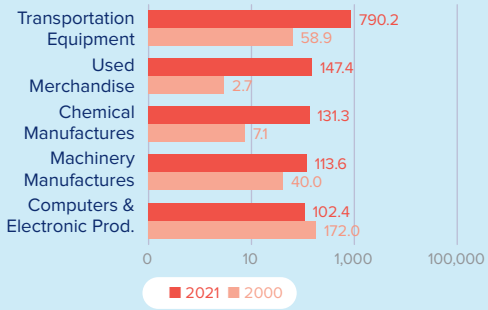
$0.6 bn

U.S. Goods Imports from Luxembourg, 2021

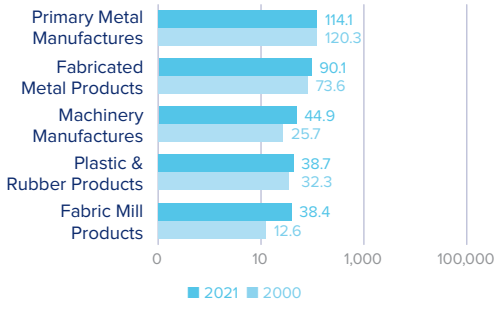
2.7% The U.S. received 2.7% of the total goods Luxembourg exported to the world...

13.6% ...but the U.S. share increases to 13.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Luxembourg ($ millions)



Top Five U.S. Goods Imports from Luxembourg ($ millions)



Top State Exporters of Goods to Luxembourg ($ millions)

1	2	3	4	5
228.4 Florida	212.4 Georgia	212.2 Virginia	141.0 California	117.4 New York

Top State Importers of Goods from Luxembourg ($ millions)

1	2	3	4	5
64.5 Virginia	49.5 New York	46.6 Texas	40.0 Florida	39.0 New Jersey

Trade in Services

$9.2 bn

U.S. Services Exports to Luxembourg, 2021

$2.3 bn

U.S. Services Imports from Luxembourg, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Malta and the United States

Jobs

United States in Malta	Malta in the United States
1,717	1,632

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$2.3 bn

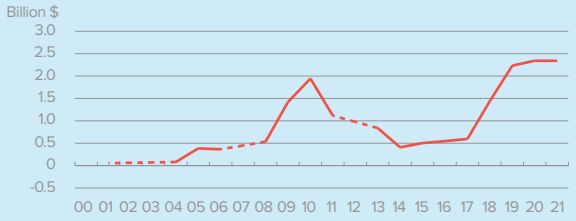
Foreign Direct Investment (FDI), 2021

$2.8 bn

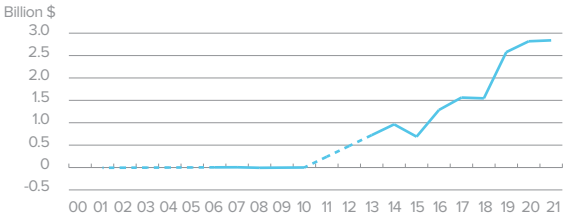
Foreign Direct Investment (FDI), 2021

Despite the country's tiny population (just 525,000 people), Malta has attracted a relatively large amount of foreign direct investment from the U.S. The investment position of the U.S. in Malta amounted to $2.3 billion in 2021. In addition, American investment directly supported jobs for roughly 1,700 workers in Malta, according to 2021 estimates. Meanwhile, Malta's direct investment position in the U.S. was $2.8 billion in 2021, which is markedly higher from its near-zero levels of investment prior to 2010.

U.S. FDI Position in Malta



Malta FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.

Trade in Goods

$0.1 bn

U.S. Goods Exports to Malta, 2021

1.7% The U.S. supplied 1.7% of Malta's total imports...

4.3% ...but the U.S. share increases to 4.3% when intra-EU trade is excluded from the total.

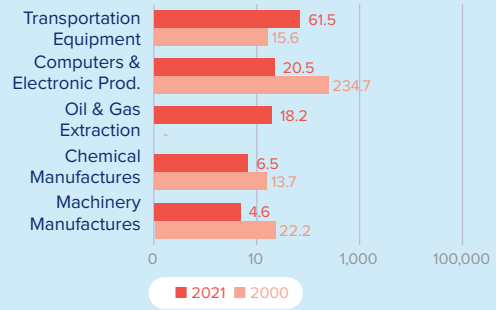
$0.2 bn

U.S. Goods Imports from Malta, 2021

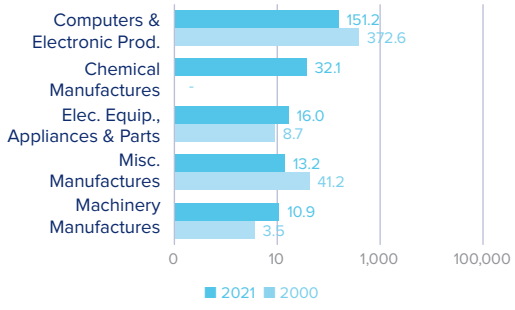
4.1% The U.S. received 4.1% of the total goods Malta exported to the world...

7.7% ...but the U.S. share increases to 7.7% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Malta ($ millions)



Top Five U.S. Goods Imports from Malta ($ millions)



Top State Exporters of Goods to Malta ($ millions)

1	2	3	4	5
47.3	19.8	9.7	6.3	6.2
Georgia	Louisiana	Texas	Iowa	California

Top State Importers of Goods from Malta ($ millions)

1	2	3	4	5
100.9	33.4	18.2	13.0	8.0
Illinois	California	Michigan	Texas	New Jersey

Trade in Services

$0.4 bn

U.S. Services Exports to Malta, 2021

$0.7 bn

U.S. Services Imports from Malta, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Netherlands and the United States

Jobs

United States in Netherlands	Netherlands in the United States
242,703	580,686

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$885.3 bn

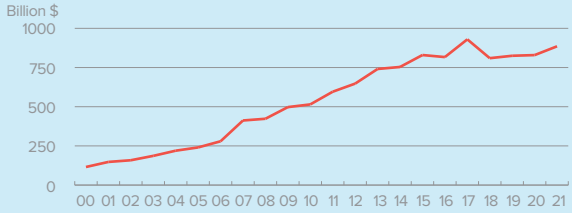
Foreign Direct Investment (FDI), 2021

$629.5 bn

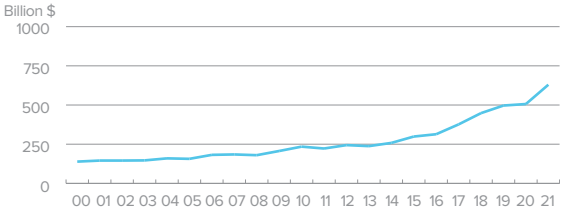
Foreign Direct Investment (FDI), 2021

America's investment stake in the Netherlands is 40% more than the amount of Dutch investment in the U.S. Still, the U.S. is a prime foreign destination for Dutch firms, which recorded an estimated $330 billion in affiliate sales in the U.S. during 2021, according to estimates. The employment balance clearly favors the U.S. with a large amount of jobs supported by Dutch firms in the U.S.

U.S. FDI Position in Netherlands



Netherlands FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$53.1 bn

U.S. Goods Exports to Netherlands, 2021

7.0% The U.S. supplied 7.0% of Netherlands's total imports...

11.9% ...but the U.S. share increases to 11.9% when intra-EU trade is excluded from the total.

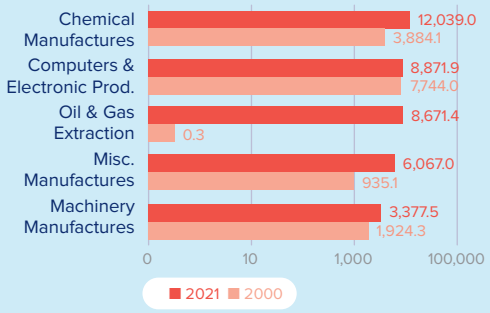
$35.1 bn

U.S. Goods Imports from Netherlands, 2021

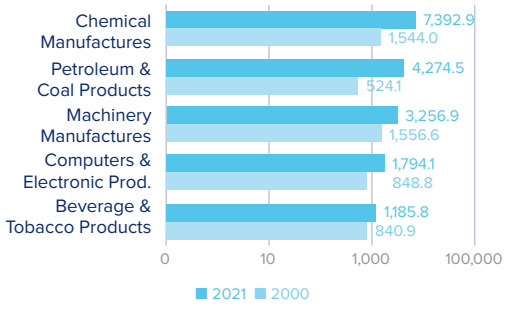
4.2% The U.S. received 4.2% of the total goods Netherlands exported to the world...

13.4% ...but the U.S. share increases to 13.4% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Netherlands ($ millions)



Top Five U.S. Goods Imports from Netherlands ($ millions)



Top State Exporters of Goods to Netherlands ($ millions)

1	2	3	4	5
13,070.6 Texas	6,104.2 California	2,213.9 Louisiana	1,674.5 Massachu-setts	1,668.0 Tennessee

Top State Importers of Goods from Netherlands ($ millions)

1	2	3	4	5
9,789.9 Illinois	2,991.9 New Jersey	2,341.2 Kentucky	2,144.9 Texas	2,031.9 North Carolina

Trade in Services

$23.8 bn

U.S. Services Exports to Netherlands, 2021

$12.2 bn

U.S. Services Imports from Netherlands, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Norway and the United States

Jobs

United States in Norway	Norway in the United States
37,875	7,854

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$30.6 bn

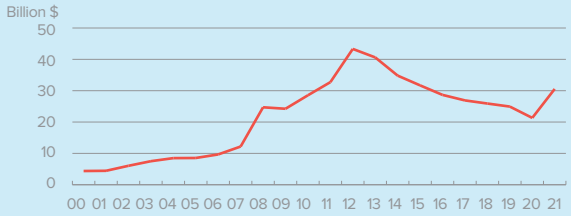
Foreign Direct Investment (FDI), 2021

$32.5 bn

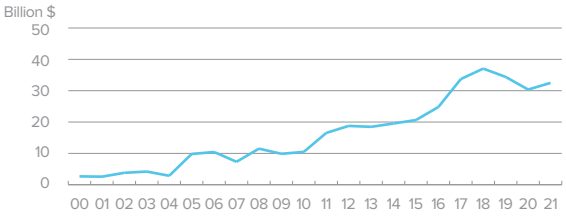
Foreign Direct Investment (FDI), 2021

U.S. FDI in Norway rebounded in 2021, and is currently below Norway's FDI position in the U.S. The employment balance, however, is heavily skewed in favor of Norway, with U.S. foreign affiliates employing roughly 38,000 Norwegian workers, according to 2021 estimates. Meanwhile Norwegian companies employed just under 8,000 workers in the U.S.

U.S. FDI Position in Norway



Norway FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$4.0 bn

U.S. Goods Exports to Norway, 2021

6.1% The U.S. supplied 6.1% of Norway's total imports...

13.4% ...but the U.S. share increases to 13.4% when trade with the EU and U.K. is excluded from the total.

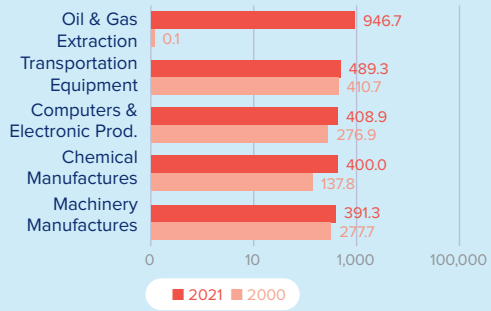
$6.7 bn

U.S. Goods Imports from Norway, 2021

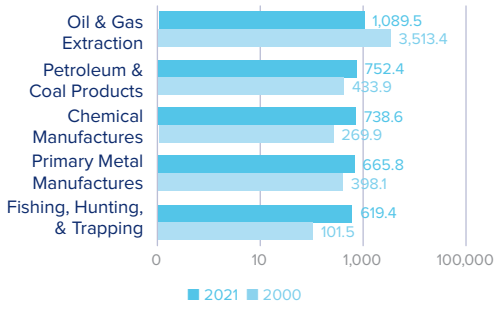
2.8% The U.S. received 2.8% of the total goods Norway exported to the world...

6.9% ...but the U.S. share increases to 6.9% when trade with the EU and U.K. is excluded from the total.

Top Five U.S. Goods Exports to Norway ($ millions)



Top Five U.S. Goods Imports from Norway ($ millions)



Top State Exporters of Goods to Norway ($ millions)

1	2	3	4	5
1,726.2	277.1	245.2	171.9	148.5
Texas	Louisiana	California	Connecticut	Pennsylvania

Top State Importers of Goods from Norway ($ millions)

1	2	3	4	5
1,328.3	931.4	706.8	412.8	378.5
New Jersey	California	Massachu-setts	Texas	Arizona

Trade in Services

$1.7 bn

U.S. Services Exports to Norway, 2021

$1.8 bn

U.S. Services Imports from Norway, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Poland and the United States

Jobs

United States in Poland	Poland in the United States
214,019	1,122

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$13.4 bn

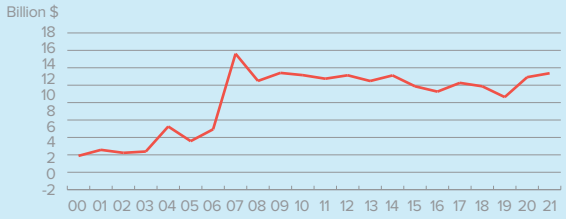
Foreign Direct Investment (FDI), 2021

$1.5 bn

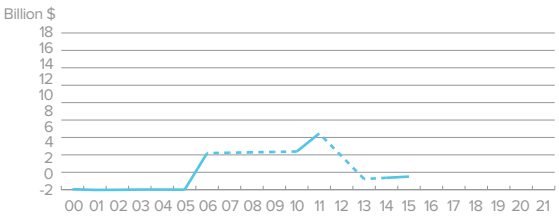
Foreign Direct Investment (FDI), 2015*

As one of the largest markets in central Europe, Poland has attracted significant sums of U.S. foreign direct investment. The estimated U.S. affiliate workforce of roughly 200,000 workers in Poland ranks number one among EU13 countries by a wide margin. Meanwhile, Polish companies have yet to make significant investments in the U.S., with little over 1,000 jobs supported by Polish firms in the U.S., and just $1.5 billion investment in 2015, the latest year with available data. *Latest year of available data.

U.S. FDI Position in Poland



Poland FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data.

Trade in Goods

$5.8 bn

U.S. Goods Exports to Poland, 2021

1.8% The U.S. supplied 1.8% of Poland's total imports...

5.4% ...but the U.S. share increases to 5.4% when intra-EU trade is excluded from the total.

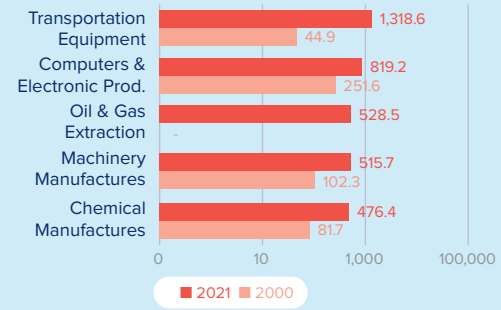
$9.7 bn

U.S. Goods Imports from Poland, 2021

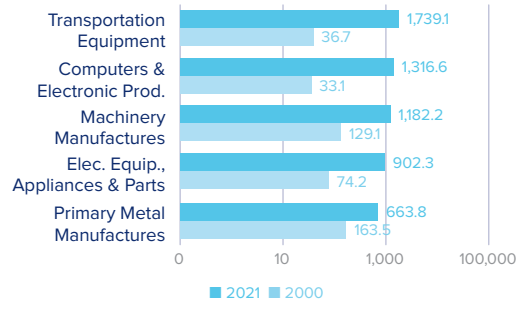
2.6% The U.S. received 2.6% of the total goods Poland exported to the world...

10.6% ...but the U.S. share increases to 10.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Poland ($ millions)



Top Five U.S. Goods Imports from Poland ($ millions)



Top State Exporters of Goods to Poland ($ millions)

1	2	3	4	5
795.3 Texas	480.5 Georgia	354.3 California	241.0 Illinois	237.7 Virginia

Top State Importers of Goods from Poland ($ millions)

1	2	3	4	5
1,165.7 New Jersey	810.1 New York	619.2 New Hampshire	596.5 Illinois	567.0 Texas

Trade in Services

$1.8 bn

U.S. Services Exports to Poland, 2021

$2.2 bn

U.S. Services Imports from Poland, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Portugal and the United States

Jobs

United States in Portugal	Portugal in the United States
33,128	816

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$2.2 bn

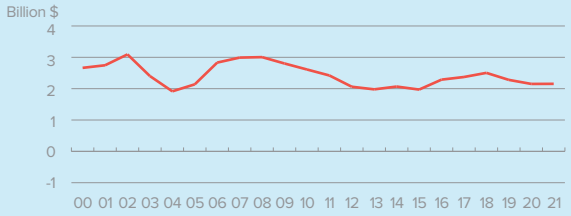
Foreign Direct Investment (FDI), 2021

$1.1 bn

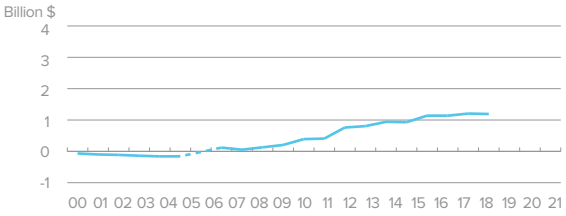
Foreign Direct Investment (FDI), 2018*

The investment balance favors Portugal, with U.S. direct investment in Portugal totaled double Portugal's FDI in the U.S. U.S. affiliates employed an estimated 33,000 Portuguese workers in 2021 compared to Portuguese affiliate employment of just over 800 Americans.

U.S. FDI Position in Portugal



Portugal FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.

Trade in Goods

$2.4 bn

U.S. Goods Exports to Portugal, 2021

2.4% The U.S. supplied 2.4% of Portugal's total imports...

9.1% ...but the U.S. share increases to 9.1% when intra-EU trade is excluded from the total.

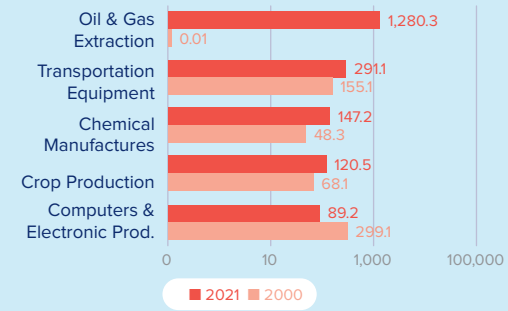
$4.9 bn

U.S. Goods Imports from Portugal, 2021

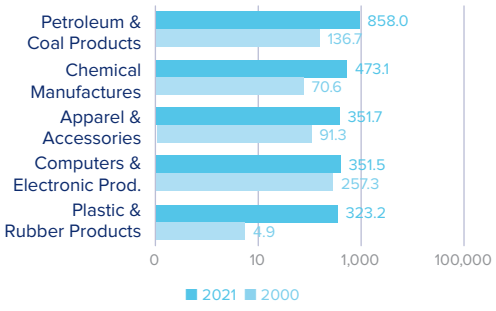
5.6% The U.S. received 5.6% of the total goods Portugal exported to the world...

19.4% ...but the U.S. share increases to 19.4% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Portugal ($ millions)



Top Five U.S. Goods Imports from Portugal ($ millions)



Top State Exporters of Goods to Portugal ($ millions)

1	2	3	4	5
1,219.3	142.9	138.7	88.3	79.7
Texas	Louisiana	Pennsylvania	Ohio	California

Top State Importers of Goods from Portugal ($ millions)

1	2	3	4	5
966.8	493.7	395.9	324.2	308.3
New Jersey	California	South Carolina	Texas	New York

Trade in Services

$0.8 bn

U.S. Services Exports to Portugal, 2021

$0.8 bn

U.S. Services Imports from Portugal, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Romania and the United States

Jobs

United States in Romania	Romania in the United States
85,244	< 51

Jobs directly supported by majority-owned affiliates. Estimates for 2020. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$2.6 bn

Foreign Direct Investment (FDI), 2021

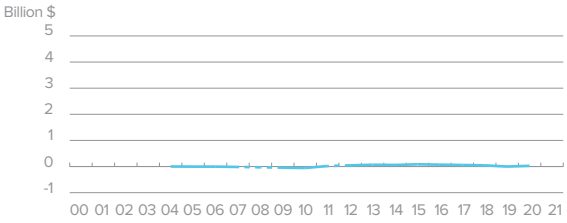
$0.03 bn

Foreign Direct Investment (FDI), 2020*

While America's investment in Romania is small relative to other EU members, U.S. investment ties with Romania have deepened over the decade. U.S. affiliates have added roughly 45,000 Romanian workers to their payrolls since 2009. Meanwhile, Romania's investment in the U.S. is relatively small. Romanian multinationals employed fewer than 50 employees in the U.S. in 2021.

U.S. FDI Position in Romania

Romania FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data.

Trade in Goods

$1.4 bn

U.S. Goods Exports to Romania, 2021

0.9% The U.S. supplied 0.9% of Romania's total imports...

3.4% ...but the U.S. share increases to 3.4% when intra-EU trade is excluded from the total.

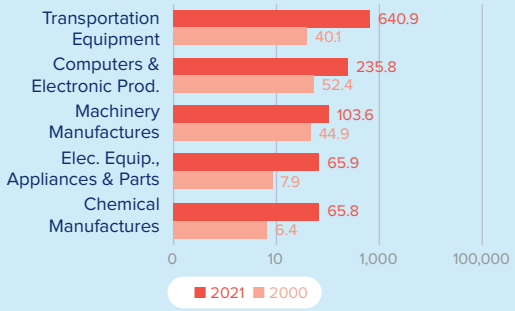
$2.9 bn

U.S. Goods Imports from Romania, 2021

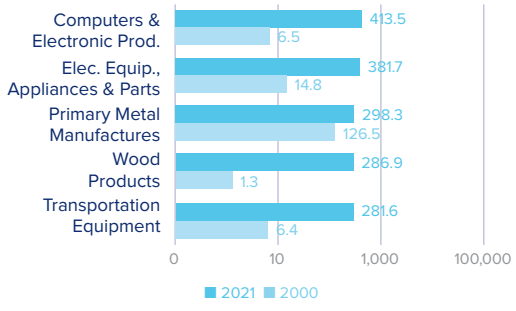
2.0% The U.S. received 2.0% of the total goods Romania exported to the world...

7.5% ...but the U.S. share increases to 7.5% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Romania ($ millions)



Top Five U.S. Goods Imports from Romania ($ millions)



Top State Exporters of Goods to Romania ($ millions)

1	2	3	4	5
312.3 Washington	275.8 Texas	79.2 California	78.2 Louisiana	62.9 New York

Top State Importers of Goods from Romania ($ millions)

1	2	3	4	5
565.4 Texas	347.7 South Carolina	163.1 Georgia	150.4 New York	136.5 Pennsylvania

Trade in Services

$0.6 bn

U.S. Services Exports to Romania, 2021

$0.5 bn

U.S. Services Imports from Romania, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Slovakia and the United States

Jobs

United States in Slovakia	Slovakia in the United States
45,349	< 50

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.8 bn

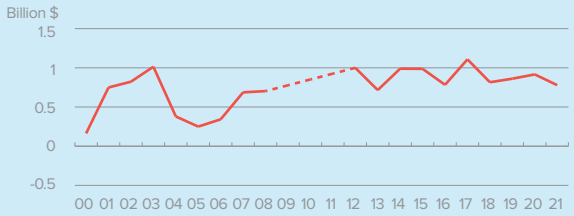
Foreign Direct Investment (FDI), 2021

$0 bn

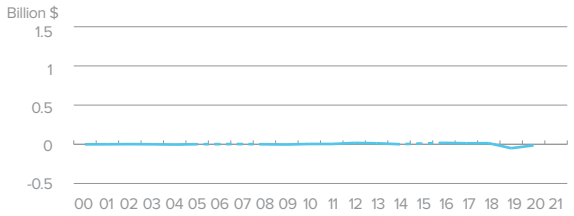
Foreign Direct Investment (FDI), 2020*

America's investment stock in Slovakia is relatively small, but foreign affiliate sales were $7.4 billion in 2021, according to estimates. U.S. foreign affiliates in Slovakia employed an estimated 45,000 workers. Meanwhile, Slovakia's direct investment position in the U.S. was relatively small in 2020 (the latest year with available data) and affiliate employment amounted to fewer than 50 workers.

U.S. FDI Position in Slovakia



Slovakia FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.
*Latest year of available data. Negative FDI positions can occur when the loans from the affiliate to the parent company exceed the equity and debt investments from the parent to the affiliate, or if a foreign affiliate incurs sufficiently large losses.

Trade in Goods

$0.3 bn

U.S. Goods Exports to Slovakia, 2021

0.5% The U.S. supplied 0.5% of Slovakia's total imports...

2.1% ...but the U.S. share increases to 2.1% when intra-EU trade is excluded from the total.

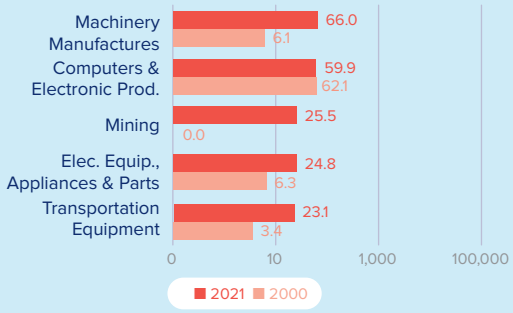
$5.1 bn

U.S. Goods Imports from Slovakia, 2021

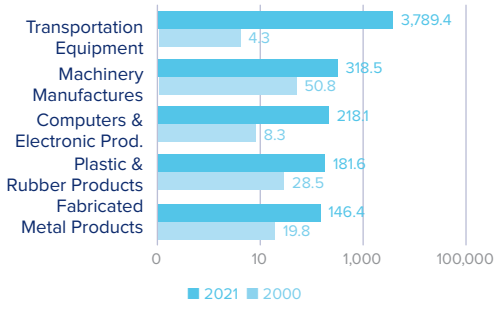
3.1% The U.S. received 3.1% of the total goods Slovakia exported to the world...

16.0% ...but the U.S. share increases to 16.0% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Slovakia ($ millions)



Top Five U.S. Goods Imports from Slovakia ($ millions)



Top State Exporters of Goods to Slovakia ($ millions)

1	2	3	4	5
41.9	40.2	36.7	24.3	20.6
Illinois	Pennsylvania	Minnesota	California	Michigan

Top State Importers of Goods from Slovakia ($ millions)

1	2	3	4	5
992.9	694.3	682.1	560.7	504.2
New Jersey	Texas	California	Florida	Rhode Island

Trade in Services

$0.3 bn

U.S. Services Exports to Slovakia, 2021

$0.2 bn

U.S. Services Imports from Slovakia, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Slovenia and the United States

Jobs

United States in Slovenia	Slovenia in the United States
4,646	< 50

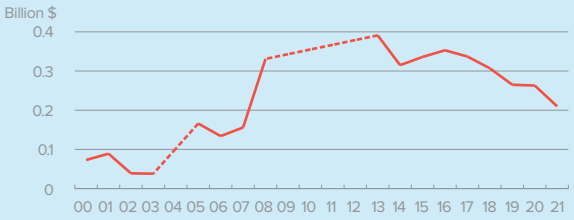
Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

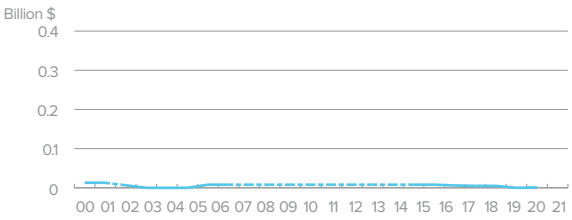
$0.2 bn	$0 bn
Foreign Direct Investment (FDI), 2021	**Foreign Direct Investment (FDI), 2020***

U.S. foreign direct investment in Slovenia continued to decline in 2021, and remains relatively low compared to other EU countries. Meanwhile, Slovenia's outward FDI stock in the U.S. was jflat, with affiliates supporting fewer than 50 jobs. U.S. direct investment in Slovenia supported about 4,600 jobs in 2021, but has been relatively flat since 2004. Estimated U.S. foreign affiliate sales in Slovenia were $800 million in 2021, compared with near-zero foreign affiliate sales earned by Slovenian firms in the U.S.

U.S. FDI Position in Slovenia



Slovenia FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
*Latest year of available data. Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.

Trade in Goods

$0.2 bn	$1.6 bn
U.S. Goods Exports to Slovenia, 2021	**U.S. Goods Imports from Slovenia, 2021**

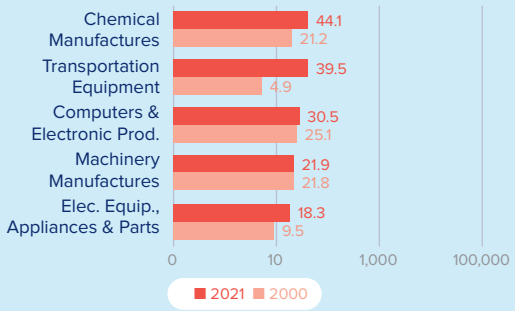
0.4% The U.S. supplied 0.4% of Slovenia's total imports...

1.0% ...but the U.S. share increases to 1.0% when intra-EU trade is excluded from the total.

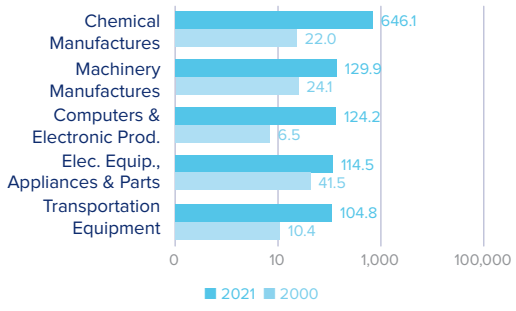
1.6% The U.S. received 1.6% of the total goods Slovenia exported to the world...

1.6% ...but the U.S. share increases to 1.6% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Slovenia ($ millions)



Top Five U.S. Goods Imports from Slovenia ($ millions)



Top State Exporters of Goods to Slovenia ($ millions)

1	2	3	4	5
26.8	17.7	16.5	15.7	14.2
Texas	Wisconsin	California	Kansas	Pennsylvania

Top State Importers of Goods from Slovenia ($ millions)

1	2	3	4	5
565.8	159.0	65.9	63.4	59.8
New Jersey	Pennsylvania	Illinois	New York	Georgia

Trade in Services

$0.1 bn	$0.07 bn
U.S. Services Exports to Slovenia, 2021	**U.S. Services Imports from Slovenia, 2021**

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis; United Nations.

Spain and the United States

Jobs

United States in Spain	Spain in the United States
187,658	94,962

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

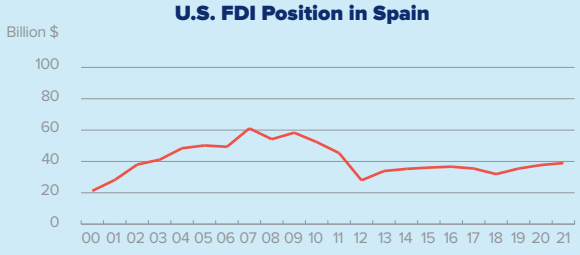
Investment

$39.0 bn
Foreign Direct Investment (FDI), 2021

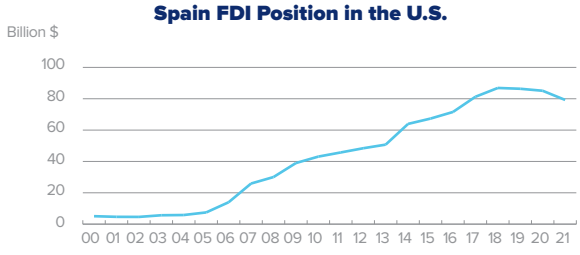
$79.3 bn
Foreign Direct Investment (FDI), 2021

Since 2011, the investment balance shifted in favor of the U.S., as Spain's economy was squeezed by a severe recession and resulting austerity measures. Since then, U.S. direct investment in Spain has slightly recovered, totaling $39 billion in 2021. Meanwhile, the U.S. has seen its inward FDI stock from Spain doubled since 2009. Prior to the 2020 Covid-19 recession, Spanish investment in the U.S. had increased every year since 2002. U.S. affiliates based in Spain employ about twice as many workers as Spanish affiliates employ in the U.S., according to 2021 estimates.

U.S. FDI Position in Spain



Spain FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$16.3 bn
U.S. Goods Exports to Spain, 2021

4.1% The U.S. supplied 4.1% of Spain's total imports...

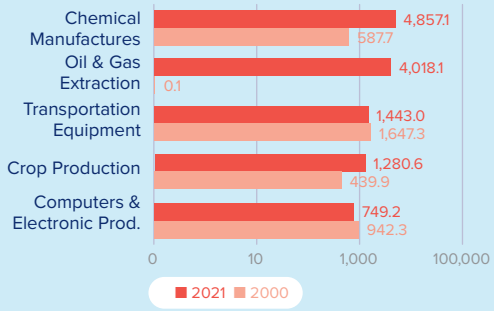
9.2% ...but the U.S. share increases to 9.2% when intra-EU trade is excluded from the total.

$18.6 bn
U.S. Goods Imports from Spain, 2021

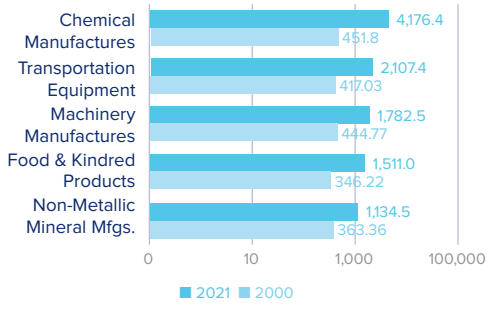
4.6% The U.S. received 4.6% of the total goods Spain exported to the world...

12.0% ...but the U.S. share increases to 12.0% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Spain ($ millions)



Top Five U.S. Goods Imports from Spain ($ millions)



Top State Exporters of Goods to Spain ($ millions)

1	2	3	4	5
4,160.4 Texas	1,745.1 Louisiana	1,385.9 California	909.2 Massachu-setts	709.0 Michigan

Top State Importers of Goods from Spain ($ millions)

1	2	3	4	5
3,248.9 New Jersey	1,632.9 Texas	1,608.2 Florida	1,340.8 California	1,067.1 New York

Trade in Services

$5.6 bn
U.S. Services Exports to Spain, 2021

$4.3 bn
U.S. Services Imports from Spain, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Sweden and the United States

Jobs

United States in Sweden	Sweden in the United States
62,418	221,646

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

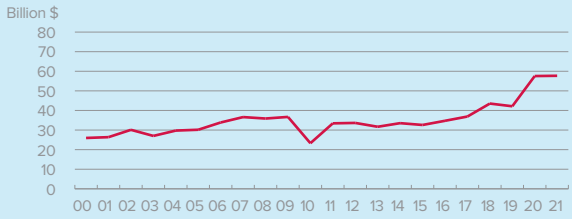
Investment

$57.7 bn
Foreign Direct Investment (FDI), 2021

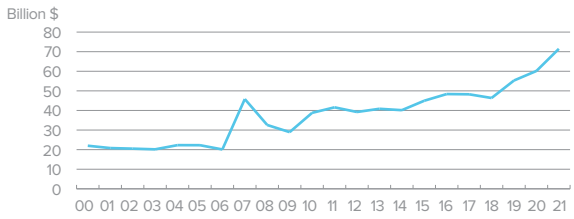
$71.5 bn
Foreign Direct Investment (FDI), 2021

U.S. FDI in Sweden was flat in 2021. Meanwhile, Sweden's investment stock in the U.S. continued its steady rise. The value added of Swedish affiliates in the U.S. ($22 billion) exceeds that of U.S. foreign affiliates in Sweden ($9 billion). The employment balance is heavily skewed in favor of the United States, with Swedish firms estimated to have employed over triple the amount of workers that U.S. firms employ in Sweden.

U.S. FDI Position in Sweden



Sweden FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

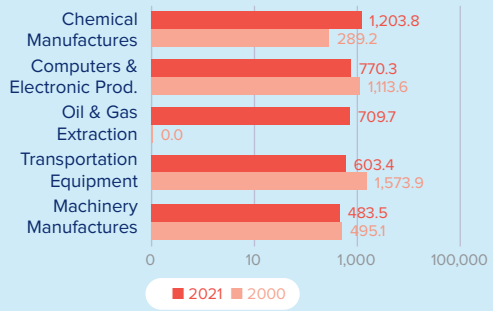
Trade in Goods

$5.3 bn
U.S. Goods Exports to Sweden, 2021

2.9% The U.S. supplied 2.9% of Sweden's total imports...

8.8% ...but the U.S. share increases to 8.8% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Exports to Sweden ($ millions)



Top State Exporters of Goods to Sweden ($ millions)

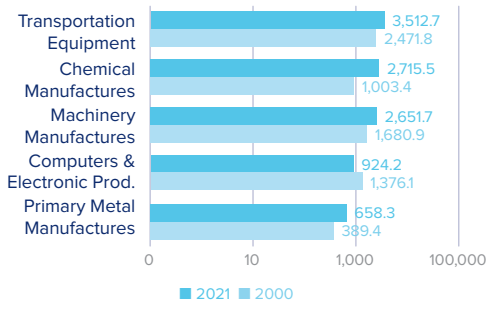
1	2	3	4	5
819.0 Texas	623.0 California	363.3 North Carolina	302.9 Pennsylvania	197.8 Indiana

$14.8 bn
U.S. Goods Imports from Sweden, 2021

8.5% The U.S. received 8.5% of the total goods Sweden exported to the world...

18.2% ...but the U.S. share increases to 18.2% when intra-EU trade is excluded from the total.

Top Five U.S. Goods Imports from Sweden ($ millions)



Top State Importers of Goods from Sweden ($ millions)

1	2	3	4	5
2,326.1 New Jersey	1,011.2 California	956.7 Pennsylvania	952.7 Maryland	932.6 Georgia

Trade in Services

$7.1 bn
U.S. Services Exports to Sweden, 2021

$3.1 bn
U.S. Services Imports from Sweden, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Switzerland and the United States

Jobs

United States in Switzerland	Switzerland in the United States
96,556	496,740

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$216.1 bn

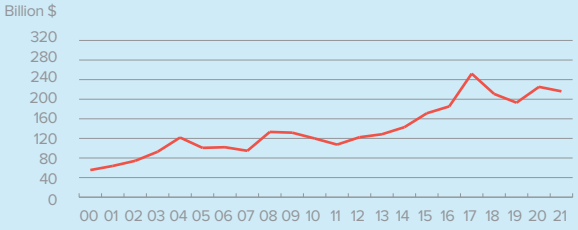
Foreign Direct Investment (FDI), 2021

$282.3 bn

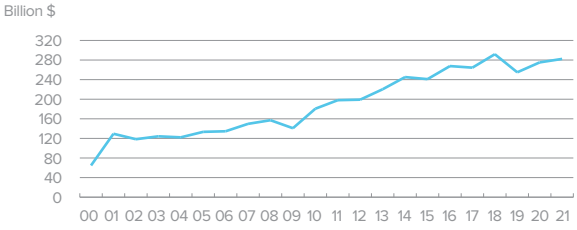
Foreign Direct Investment (FDI), 2021

The investment balance favors the U.S. Swiss direct investment stock in the U.S. exceeded U.S. investment in Switzerland by about $66 billion. Estimates show the employment balance significantly favors the United States.

U.S. FDI Position in Switzerland



Switzerland FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$23.6 bn

U.S. Goods Exports to Switzerland, 2021

7.4% The U.S. supplied 7.4% of Switzerland's total imports...

14.6% ...but the U.S. share increases to 14.6% when trade with the EU and U.K. is excluded from the total.

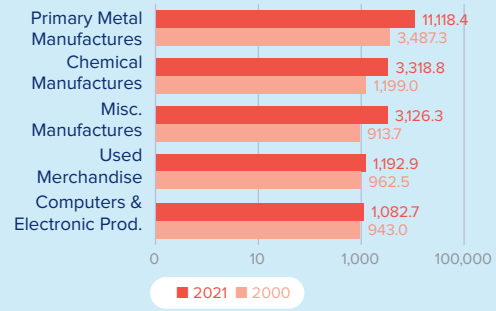
$63.2 bn

U.S. Goods Imports from Switzerland, 2021

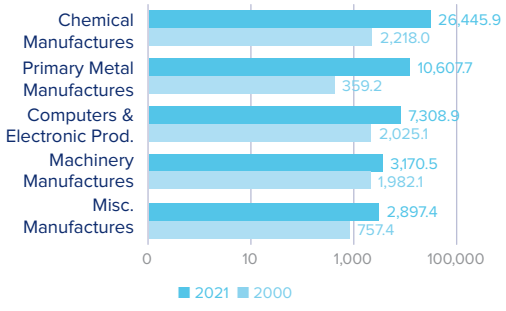
16.6% The U.S. received 16.6% of the total goods Switzerland exported to the world...

28.5% ...but the U.S. share increases to 28.5% when trade with the EU and U.K. is excluded from the total.

Top Five U.S. Goods Exports to Switzerland ($ millions)



Top Five U.S. Goods Imports from Switzerland ($ millions)



Top State Exporters of Goods to Switzerland ($ millions)

1	2	3	4	5
11,561.4 New York	2,133.2 Nevada	1,418.3 California	944.6 Texas	913.9 Massachu-setts

Top State Importers of Goods from Switzerland ($ millions)

1	2	3	4	5
13,884.3 New York	12,100.3 New Jersey	5,043.3 Pennsylvania	4,743.5 Kentucky	3,962.6 Indiana

Trade in Services

$47.1 bn

U.S. Services Exports to Switzerland, 2021

$28.1 bn

U.S. Services Imports from Switzerland, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Türkiye and the United States

Jobs

United States in Türkiye	Türkiye in the United States
56,055	4,998

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$6.2 bn

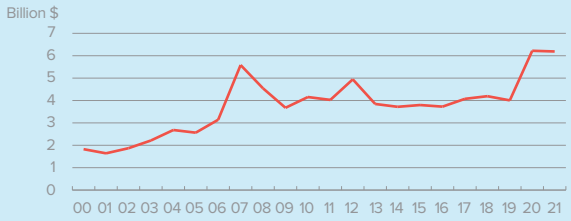
Foreign Direct Investment (FDI), 2021

$2.3 bn

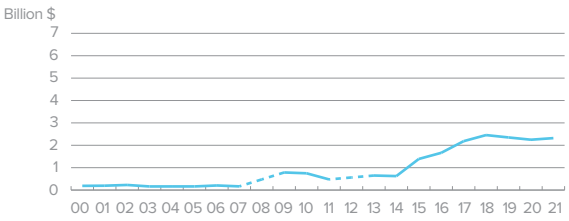
Foreign Direct Investment (FDI), 2021

The investment balance favors Türkiye — the U.S. had $6.2 billion of foreign direct investment in Türkiye in 2021 versus Türkiye's $2.3 billion of investment in the U.S. According to 2021 estimates, affiliates of U.S. multinationals had sales of $25 billion in Türkiye compared to Türkiye's affiliate sales in the U.S. of only $1.3 billion. U.S. affiliate employment in Türkiye remains near all-time highs, despite a slight Covid-19 related pullback in 2020.

U.S. FDI Position in Türkiye



Türkiye FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.

Trade in Goods

$11.9 bn

U.S. Goods Exports to Türkiye, 2021

4.8% The U.S. supplied 4.8% of Türkiye's total imports...

7.1% ...but the U.S. share increases to 7.1% when trade with the EU and U.K. are excluded from the total.

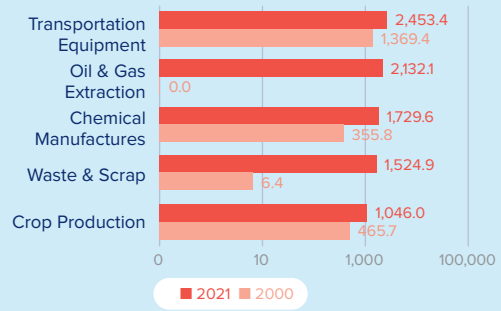
$15.9 bn

U.S. Goods Imports from Türkiye, 2021

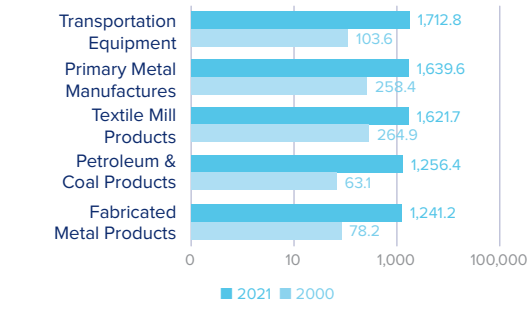
6.5% The U.S. received 6.5% of the total goods Türkiye exported to the world...

11.1% ...but the U.S. share increases to 11.1% when trade with the EU and U.K. are excluded from the total.

Top Five U.S. Goods Exports to Türkiye ($ millions)



Top Five U.S. Goods Imports from Türkiye ($ millions)



Top State Exporters of Goods to Türkiye ($ millions)

1	2	3	4	5
2,714.1	1,135.2	1,009.9	838.9	654.7
Texas	Louisiana	Washington	New Jersey	California

Top State Importers of Goods from Türkiye ($ millions)

1	2	3	4	5
2,234.4	1,865.7	1,578.4	1,377.0	1,202.3
Texas	New Jersey	New York	California	Georgia

Trade in Services

$3.4 bn

U.S. Services Exports to Türkiye, 2021

$2.1 bn

U.S. Services Imports from Türkiye, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Ukraine & the United States

Jobs

United States in Ukraine	Ukraine in the United States
40,501	202

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$0.5 bn

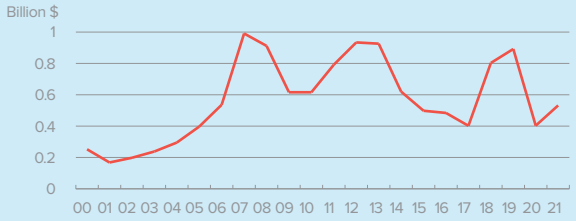
Foreign Direct Investment (FDI), 2021

$0.0 bn

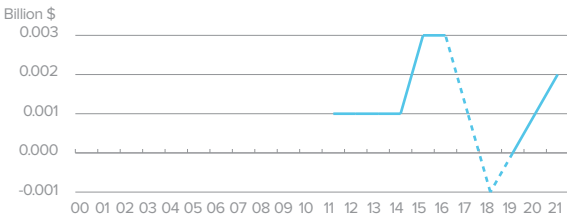
Foreign Direct Investment (FDI), 2021

In terms of the U.S.-U.K. investment balance, the U.S. had a larger cross-border impact in 2021. U.S. foreign direct investment in Ukraine totaled $500 million in 2021, and Ukraine's foreign direct investment in the U.S. was $2 million. Estimated sales of American and Ukrainian affiliates in each other's markets were a combined $9.3 billion in 2021. According to estimates for 2021, U.S. affiliates employed roughly 40,500 workers in Ukraine, while Ukrainian affiliates employed about 200 Americans.

U.S. FDI Position in Ukraine



Ukraine FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.
Note: Dotted line indicates that data has been suppressed for a particular year to avoid disclosure of individual company data.

Trade in Goods

$2.5 bn

U.S. Goods Exports to Ukraine, 2021

4.9% The U.S. supplied 4.9% of Ukraine's total imports...

8.1% ...but the U.S. share increases to 8.1% when trade with the EU is excluded from the total.

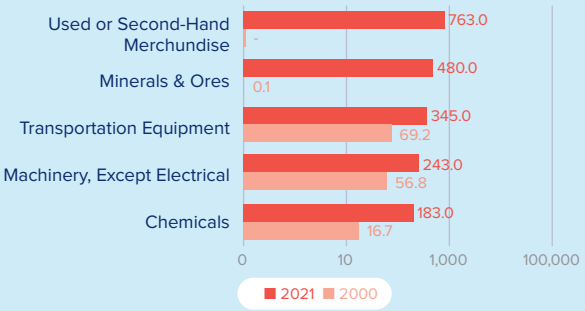
$1.9 bn

U.S. Goods Imports from Ukraine, 2021

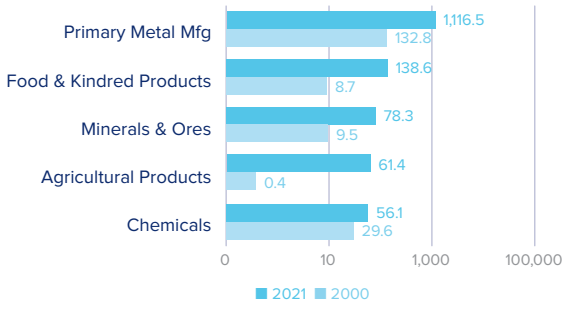
2.4% The U.S. received 2.4% of the total goods Ukraine exported to the world...

3.9% ...but the U.S. share increases to 3.9% when trade with the EU is excluded from the total.

Top Five U.S. Goods Exports to Ukraine ($ millions)



Top Five U.S. Goods Imports from Ukraine ($ millions)



Top State Exporters of Goods to Ukraine ($ millions)

1	2	3	4	5
371.6	332.1	250.9	201.3	199.0
West Virginia	New Jersey	California	Texas	Georgia

Top State Importers of Goods from Ukraine ($ millions)

1	2	3	4	5
563.5	277.3	251.6	150.1	80.6
Illinois	Ohio	Texas	Mississippi	California

Trade in Services

$2.7 bn

U.S. Services Exports to Ukraine, 2021

$1.9 bn

U.S. Services Imports from Ukraine, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis; State Statistics Service of Ukraine.

United Kingdom and the United States

Jobs

United States in United Kingdom	United Kingdom in the United States
1,512,677	1,241,952

Jobs directly supported by majority-owned affiliates. Estimates for 2021. Total U.S.-related jobs are likely to be higher, because these figures do not include jobs created by trade flows, indirect employment effects through distributors or suppliers, or via non-equity arrangements such as strategic alliances, joint ventures, or other deals.

Investment

$1005.5 bn

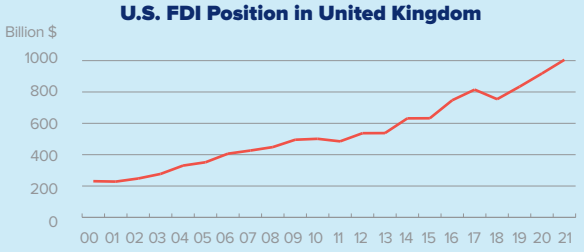
Foreign Direct Investment (FDI), 2021

$512.4 bn

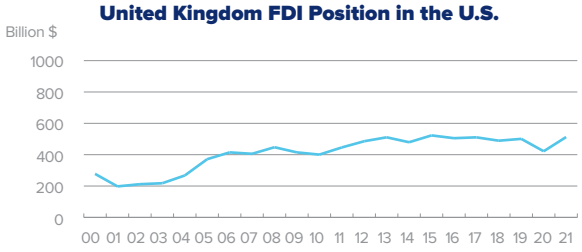
Foreign Direct Investment (FDI), 2021

In terms of the U.S.-U.K. investment balance, the U.S. had a larger cross-border impact in 2021. U.S. foreign direct investment in the United Kingdom totaled a record $1 trillion in 2021, and the U.K.'s foreign direct investment in the U.S. rose slightly to $512 billion. Estimated sales of American and British affiliates in each other's markets were a combined $1.3 trillion in 2021. According to estimates for 2021, U.S. affiliates employed roughly 1.5 million workers in the U.K. while U.K. affiliates employed about 1.2 million Americans.

U.S. FDI Position in United Kingdom



United Kingdom FDI Position in the U.S.



Foreign direct investment position, historic-cost basis, 2000-2021.

Trade in Goods

$61.4 bn

U.S. Goods Exports to United Kingdom, 2021

8.3% The U.S. supplied 8.3% of United Kingdom's total imports...

15.4% ...but the U.S. share increases to 15.4% when trade with the EU is excluded from the total.

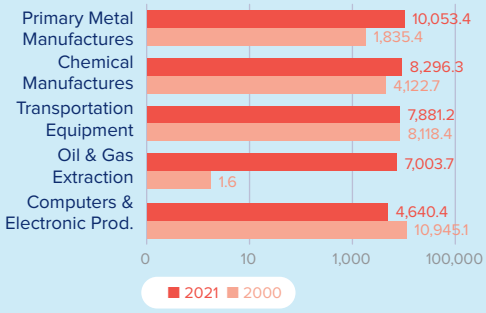
$56.4 bn

U.S. Goods Imports from United Kingdom, 2021

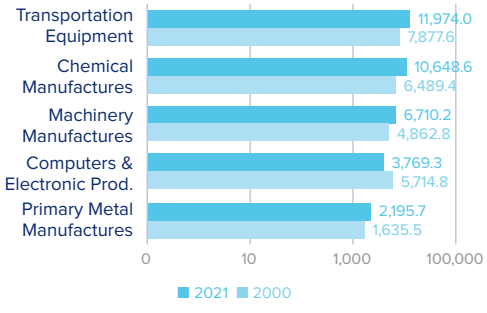
13.7% The U.S. received 13.7% of the total goods United Kingdom exported to the world...

25.6% ...but the U.S. share increases to 25.6% when trade with the EU is excluded from the total.

Top Five U.S. Goods Exports to United Kingdom ($ millions)



Top Five U.S. Goods Imports from United Kingdom ($ millions)



Top State Exporters of Goods United Kingdom ($ millions)

1	2	3	4	5
9,357.5	8,540.0	4,360.4	4,345.7	3,860.0
Texas	Utah	New Jersey	California	New York

Top State Importers of Goods from United Kingdom ($ millions)

1	2	3	4	5
7,859.3	4,477.2	3,985.5	3,909.0	3,532.0
New Jersey	Texas	New York	California	Georgia

Trade in Services

$67.8 bn

U.S. Services Exports to United Kingdom, 2021

$61.1 bn

U.S. Services Imports from United Kingdom, 2021

Sources: Bureau of Economic Analysis; U.S. Commerce Department; International Monetary Fund; Office of Trade and Economic Analysis.

Notes on Terms, Data and Sources

Employment, Investment, and Trade Linkages for the 50 U.S. States and Europe

Jobs data are from the U.S. Commerce Department's Bureau of Economic Analysis (BEA). BEA employment by state is only available for Canada, France, Germany, Japan, the Netherlands, Switzerland, and the United Kingdom; for this reason, other countries may not be listed in this jobs section. Data on investment is from SelectUSA, a program led by the U.S. Department of Commerce, using data from fDi Markets. The data show number of Greenfield FDI projects announced over the span of ten years; this does not directly translate to the value of projects or jobs added. Trade data comes from the U.S. Census Bureau's USA Trade Online database as well as the International Trade Administration at the U.S. Commerce Department. Europe includes Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Georgia, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Svalbard, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, Uzbekistan, Vatican City. The top ten exports and imports bar charts employ a logarithmic scale to facilitate cross-state comparisons.

Investment and Trade for the EU27, UK, Norway, Switzerland, Turkey, Ukraine and the U.S.

Investment and jobs data are from the Bureau of Economic Analysis, with employment figures representing author estimates for 2021. Dotted lines on the FDI trend for certain countries indicate that data was unavailable for that time period. Data on exports and imports of goods and services are from the U.S. Commerce Department. The bar charts employ logarithmic scales to facilitate cross-country comparisons. Data on trade exports and imports by state were extracted from the U.S. Census Bureau's USA Trade Online database. The data representing the United States' share of imports and exports were constructed using data from the International Monetary Fund's Direction of Trade Statistics database.

Foreign direct investment (FDI) measures the direct investment position between foreign affiliates and their parent companies. These statistics specifically measure the U.S. or European parent's share, or interest, in its foreign affiliate rather than overall size or level of operations of the foreign affiliate. The U.S. direct investment position abroad is equal to the value of U.S. par¬ents' equity in, and net outstanding loans to, their foreign affiliates at historical cost.

Total assets, employment, sales, research & development, and value-added statistics are sourced from the BEA's Survey of Activities of Multinational Enterprises. These statistics on the activities of majority-owned foreign affiliates are not adjusted for the ownership share of the parent company. Thus, for example, the employment statistics include all the employees of each affiliate, including affiliates in which the U.S. parent's ownership share is less than 100 percent. Total assets on a majority-owned foreign affiliate's balance sheet measures the affiliate's total assets, including the share of assets not owned by the U.S. parent.

Majority-owned foreign affiliates are affiliates that are more than 50 percent owned by their U.S. parent. Majority-owned U.S. affiliates are affiliates that are more than 50 percent owned by the European parent company.

Digital Services

Information and communications technology (ICT) services, or *digital services*, are services used to facilitate information processing and communication. The U.S. Bureau of Economic Analysis (BEA) defines digital services as including three categories of international trade in services: telecommunications services, computer services, and charges for the use of intellectual property associated with computer software. *Digitally enabled services, or potentially ICT-enabled services*, are services that can be, but not necessarily are, delivered remotely over ICT networks. These include insurance services; financial services; charges for the use of intellectual property; telecommunications, computer, and information services; research and development services; professional and management consulting services; architectural, engineering, scientific, and other technical services; trade-related services; and certain other services included in personal, cultural, and recreational services (audiovisual services and other personal, cultural, and recreational services). Potentially ICT-enabled services include ICT services.

E-Commerce

Most estimates of e-commerce do not distinguish whether such commerce is domestic or international. In addition, many metrics do not make it clear whether they cover all modes of e-commerce or only the leading indicators of business-to-business (B2B) and business-to-consumer (B2C) e-commerce. Finally, there are no official data on the value of cross-border e-commerce sales broken down by mode; official statistics on e-commerce are sparse and usually based on surveys rather than on real data. The U.S. International Trade Commission (ITC) defines global e-commerce as the sale of goods and services over the internet.

Terms

Throughout this report, the terms "EU," "EU27" or "EU (excluding UK)" refers to all 27 member states of the European Union, excluding the United Kingdom. The terms "EU28" or "EU (including UK)" or "EU+UK" include all 27 member states of the European Union plus the United Kingdom. The term EU15 refers to older EU member states: United Kingdom, Ireland, Belgium, Luxembourg, the Netherlands, Austria, Spain, Italy, Greece, France, Germany, Portugal, Sweden, Finland, and Denmark. The term EU13 refers to newer EU member states: Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Malta, Cyprus, Romania and Bulgaria, and Croatia. The "euro area" includes those EU member states that have adopted the euro as their currency: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, and Spain. The euro area data does not yet include Croatia, which joined the eurozone in 2023.

In addition to the above, the term "Europe" in this report refers to the following: all 27 members of the European Union plus Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Gibraltar, Greenland, Iceland, Kazakhstan, Kosovo, Kyrgyzstan, Macedonia, Malta, Moldova, Monaco, Montenegro, Norway, Russia, Serbia, San Marino, Switzerland, Türkiye, Tajikistan, Turkmenistan, Ukraine, the United Kingdom, Uzbekistan, and Vatican City.

About the Authors

Daniel S. Hamilton and **Joseph P. Quinlan** have been producing *The Transatlantic Economy* annual survey since 2004. They have authored and edited a series of award-winning books and articles on the modern transatlantic economy, including *Atlantic Rising: Changing Commercial Dynamics in the Atlantic Basin; Germany and Globalization; France and Globalization; Globalization and Europe: Prospering in a New Whirled Order; Sleeping Giant: Awakening the Transatlantic Services Economy; Protecting Our Prosperity: Ensuring Both National Security and the Benefits of Foreign Investment in the United States; Deep Integration: How Transatlantic Markets are Leading Globalization; and Partners in Prosperity: The Changing Geography of the Transatlantic Economy.* Together they were recipients of the 2007 Transatlantic Leadership Award by the European-American Business Council and the 2006 Transatlantic Business Award by the American Chamber of Commerce to the European Union.

Daniel S. Hamilton is Senior non-resident Fellow at the Brookings Institution and Senior Fellow at the Foreign Policy Institute of Johns Hopkins University's Paul H. Nitze School of Advanced International Studies, where he has served as Austrian Marshall Plan Foundation Fellow and Richard von Weizsäcker Professor. During the 2020-2021 academic year he directed the Global Europe Program at the Woodrow Wilson Center. He was the Founding Director of the SAIS Center for Transatlantic Relations and for 15 years served as Executive Director of the American Consortium on EU Studies. He is President of the Transatlantic Leadership Network, and has been a consultant for Microsoft and Breakthrough Energy, and an advisor to the U.S. Business Roundtable, the Transatlantic Business Dialogue, and the European-American Business Council. Recent books include *Paradigm Lost? The European Union and the Challenges of a New World,* edited with Gregor Kirchhof and Andreas Rödder; *The Arctic and World Order; Exiting the Cold War, Entering a New World; and Open Door: NATO and Euro-Atlantic Security After the Cold War,* the latter three edited with Kristina Spohr; *Europe Whole and Free: Vision and Reality; Turkey in the North Atlantic Marketplace: Creating a North Atlantic Marketplace: Three Paths, One Detour, A U-Turn and the Road to Nowhere; The Transatlantic Digital Economy 2017; Rule-Makers or Rule-Takers? Exploring the Transatlantic Trade and Investment Partnership,* edited with Jacques Pelkmans; *and The Geopolitics of TTIP.* He has served as U.S. Deputy Assistant Secretary of State and Associate Director of the Policy Planning Staff for two U.S. Secretaries of State.

Joseph P. Quinlan is Senior Fellow at the Transatlantic Leadership Network, with extensive experience in the U.S. corporate sector. He is a leading expert on the transatlantic economy and well-known global economist/strategist on Wall Street. He specializes in global capital flows, international trade and multinational strategies. He lectures at Fordham University, and his publications have appeared in such venues as *Foreign Affairs, the Financial Times and the Wall Street Journal. He is the author of The Last Economic Superpower: The Retreat of Globalization, the End of American Dominance, and What We Can Do About It* (New York: McGraw Hill, 2010).

THE TRANSATLANTIC ECONOMY 2023

Annual Survey of Jobs, Trade and Investment between the United States and Europe

Daniel S. Hamilton and Joseph P. Quinlan

20th Anniversary Edition

The Transatlantic Economy 2023 offers the most up-to-date set of facts and figures describing the deep economic integration binding Europe and the United States. It documents European-sourced jobs, trade and investment in each of the 50 U.S. states, and U.S.-sourced jobs, trade and investment in each member state of the European Union and other European countries. It reviews key headline trends and helps readers understand the distinctive nature of transatlantic economic relations.

The transatlantic economy has proven to be remarkably resilient in the face of multiple headwinds, including the Covid-19 pandemic, Russia's war on Ukraine, massive energy transformations, inflationary and recessionary pressures, supply chain disruptions, and ripples generated by China's activities. Key sectors of the transatlantic economy are integrating as never before, underpinning a multi-trillion-dollar economy that creates millions of jobs on both sides of the Atlantic.

The Transatlantic Economy 2023 explains international support for Ukraine and sanctions against Russia, major shifts in the transatlantic energy economy, how digital connections drive economic ties, and why transatlantic commercial bonds matter for producers, consumers, workers, innovators, investors, and communities.

The Transatlantic Economy 2023 offers key and often counterintuitive insights into the role of the United States and Europe in the global economy that have important implications for policymakers, business leaders, and local officials.

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