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# The Global Role of the U.S. Economy

## Linkages, Policies and Spillovers

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## Abstract

This paper analyzes the role of the United States in the global economy and examines the extent of global spillovers from changes in U.S. growth, monetary and fiscal policies, and uncertainty in its financial markets and economic policies. Developments in the U.S. economy, the world's largest, have effects far beyond its shores. A surge in U.S. growth could provide a significant boost to the global economy. Tightening U.S. financial conditions—whether due to contractionary U.S. monetary policy or other reasons—could reverberate across global financial markets, with adverse effects on some emerging market and developing economies that rely heavily on external financing. In addition, lingering uncertainty about the course of U.S. economic policy could have an appreciably negative effect on global growth prospects. While the United States plays a critical role in the world economy, activity in the rest of the world is also important for the United States.


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# The Global Role of the U.S. Economy: Linkages, Policies and Spillovers

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**JEL Classi ication**: C15; E32; E52; F13; H30; 051

**Key Words**: United States; uncertainty; trade; business cycles; global economy.

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# 1 Introduction[1]

Developments in the U.S. economy, because of its size and international linkages, are bound to have substantial implications for the global economy. The United States is the world's single largest economy (at market exchange rates), accounting for almost 22 percent of global output and over a third of stock market capitalization. It is prominent in virtually every global market, accounting for about one-tenth of global trade flows, one-fifth of global FDI stock, close to one-fifth of remittances, and one-fifth of global energy demand. Since the U.S. dollar is the most widely used currency in global trade and financial transactions, changes in U.S. monetary policy and investor sentiment play a major role in driving global financing conditions.

At the same time, the global economy is important for the United States. Affiliates of U.S. multinationals operating abroad and affiliates of foreign companies located in the United States account for a sizable share of output, employment, cross-border trade and financial flows. One-sixth of consumer goods purchases by U.S. consumers are for imported goods, with an even higher share in cars and consumer electronics.

While there is an extensive body of work that examines different aspects of the role of the U.S. economy and the global spillovers it generates, the literature lacks an integrated and comprehensive overview on this important topic.[2] The paper fills this gap in the literature by providing an overview of the role of the United States in the global economy and quantifying the global spillovers from changes in U.S. growth, monetary and fiscal policies, and uncertainty in its financial markets and economic policies. Specifically, the paper addresses four major questions. First, how important are economic linkages between the U.S. economy and the world? Second, how synchronous are business cycles in the United States and other economies? Third, how large are global spillovers from shocks originating in the United States? Finally, how important is the global economy for the United States?

The rest of the paper is organized as follows: Section 2 examines the economic linkages between the United States and the world economy focusing on trade, financial and commodity markets; Section 3 explores the synchronization of U.S. and global business and financial cycles; Section 4 quantifies the extent to which changes in U.S. growth spill over to the global

[1]This paper draws from a background study featured in World Bank 2017. Figures and background data presented here are available at www.worldbank.org/gep.

[2]Some studies focus on the magnitude of real and financial spillovers from the United States and other advanced economies (World Bank 2016a; IMF 2015a and IMF 2015b; Arteta et al. 2015). Shambaugh (2016) examines the importance of global growth for the U.S. economy.

economy zooming in on changes in financial, monetary and fiscal policy and uncertainty; Section 5 discusses potential channels of spillovers to the United States from the global economy; and finally, Section 6 concludes.

# 2 Linkages between the United States and the World

With an estimated nominal GDP of more than $18 trillion in 2016, the United States is the world's single largest economy and has the world's third largest population. It accounts for more than 25 percent of global GDP (at 2015 market exchange rates), 11 percent of global trade, 12 percent of bank foreign claims, and 35 percent of global stock market capitalization (Figures 1 and 2).[3] The U.S. share of global output and trade has remained broadly stable since the 1980s, whereas the share of other major advanced economies has declined gradually. The United States is the single largest international creditor and debtor: it holds the largest stock of foreign assets and liabilities and, by a wide margin, the largest net foreign asset position.

U.S. trade and financial integration with other advanced economies and EMDEs—especially in Latin America and the Caribbean (Figure 3)—runs deep. Countries whose trade and financial ties are predominantly with the United States are directly exposed to U.S. developments. In addition, those that are in general highly open to global trade and finance are indirectly exposed because of widespread spillovers from the United States.

## 2.1 Trade links

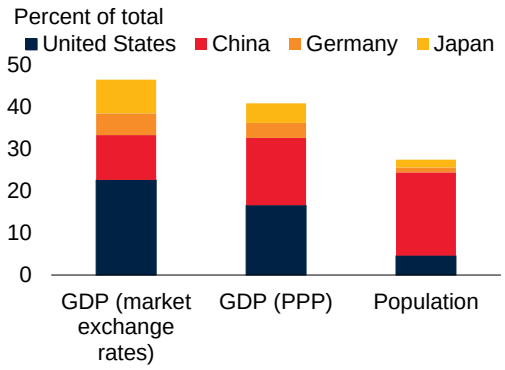
Trade accounted for 28 percent of U.S. GDP in 2015, considerably less than the average for other advanced economies (70 percent) but significantly larger than in the 1980s (18 percent). The United States is the world's single largest importer and exporter of goods and services, and the largest exporter and importer of business services (Figure 4). It accounts for 14 percent of global goods imports and 9 percent of global services imports.

Manufactured goods account for more than three-quarters of U.S. goods imports, with oil imports making up most of the remainder despite a steady decline since 2000. The most prominent imported manufacturing categories are motor vehicles, data processing machines, and drugs. More than two-thirds of U.S. manufacturing imports originate from China (24

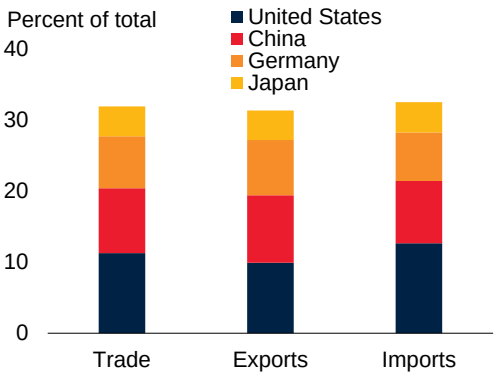
[3]At Purchasing Power Parity exchange rates, the United States is the world's second largest economy with about 16 percent of global GDP in 2015. China is the world's largest, accounting for 17 percent of global GDP.

Figure 1: United States: Size and trade linkages

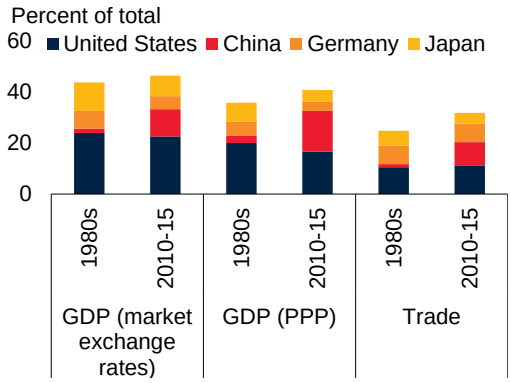
(A) Size of major economies, 2010-15




(B) Share of global trade, 2010-15

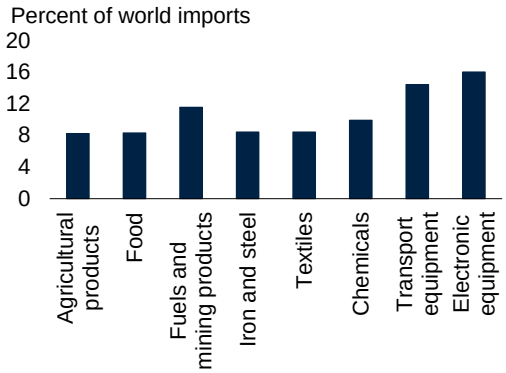



(C) Share of global GDP and trade over time

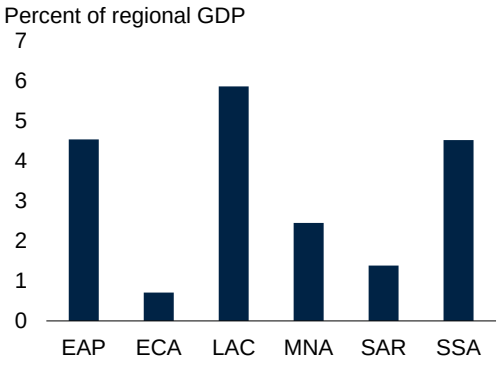



(D) U.S. trade openness over time


(E) U.S. share of global imports, 2010-15



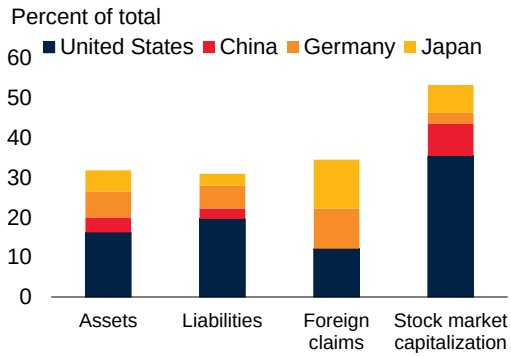

(F) Exports to the United States, 2010-15



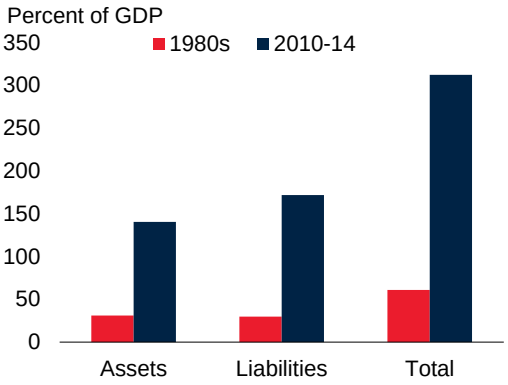

Sources: World Bank, International Monetary Fund, UN Population Statistics.
A.C. "PPP" stands for purchasing power parity exchange rates.
B. Trade is the sum of exports and imports of goods.
D. Trade is the sum of exports and imports of goods and services.
E. Goods imports.
F. "EAP" stands for East Asia and Pacific; "ECA" stands for Europe and Central Asia; "LAC" stands for Latin America and the Caribbean; "MNA" stands for Middle East and North Africa; "SAR" stands for South Asia; and "SSA" stands for Sub-Saharan Africa.

Figure 2: United States: Size and financial linkages

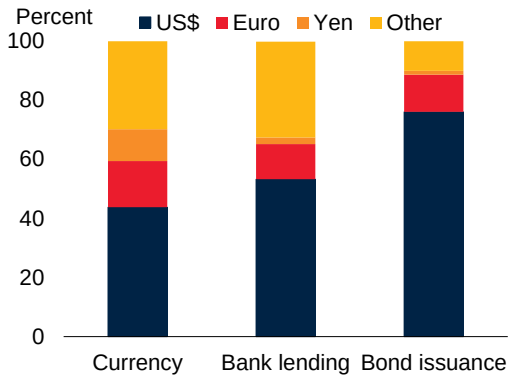
(A) Financial market size, 2010-15



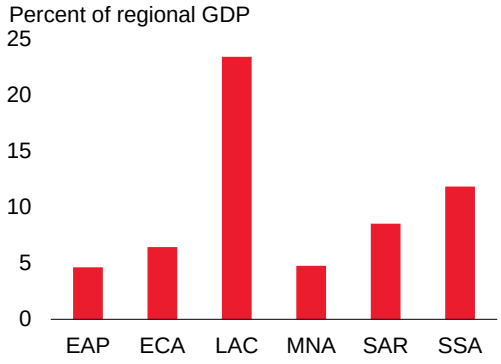

(B) U.S. financial openness, 2010-14




(C) Share of cross-border financial market transactions denominated in U.S. dollar, 2016




(D) Capital investment by the United States, 2010-15




Sources: World Bank, Lane and Milesi-Ferretti (2007), Bank for International Settlements, International Monetary Fund, World Federation of Exchange.
A. Foreign claims are consolidated foreign claims of BIS-reporting banks headquartered in respective countries or locations (data unavailable for China). Assets and liabilities are international investment positions. Average share for 2010-15, except for assets and liabilities (2010-14).
B. Total is the sum of assets and liabilities. Average shares in GDP over the periods of 1980-89 and 2010-14.
C. For currency, totals sum to 100 percent because each foreign exchange transaction involves two different currencies. "Euro" includes all legacy currencies of the Euro as well as the European Currency Unit. Data for the center and right bars are for June 2016.
D. Capital investment refers to stocks of foreign direct investment (FDI), portfolio investment, and cross-border bank lending from the United States to EMDE regions. Country coverage varies by capital investment component. As FDI data are not available for 2015, data up to 2014 are used for FDI.

percent of imports), the European Union (20 percent of imports), Mexico and Canada (combined 24 percent of imports).

The United States is the single largest export destination for one-fifth of the world's countries. It is the largest export market for more than half of the EMDEs in Latin America and the Caribbean, and South Asia, and the primary export market for several countries in other EMDE regions, especially in East Asia Pacific. Mexico, Colombia, Ecuador and many smaller Central American EMDEs rely particularly heavily on exports to the United States.

The growth of trade linkages between the United States and other countries has taken place in an era of trade liberalization. Since 1948, the General Agreement on Trade and Tariffs (GATT) and, since 1995, the World Trade Organization (WTO) have provided a multilateral framework for this process. The majority of U.S. trade is conducted under the Most Favored Nation (MFN) regime, with average tariffs at 3.5 percent (5.2 percent for agricultural products). In addition to multilateral agreements, the United States has negotiated 14 bilateral or regional trade agreements with 20 partner countries, which cover 32 percent of its imports of goods and services.[4] The largest of these agreements is the North American Free Trade Agreement (NAFTA), in force since 1994. The United States also grants unilateral preferences to a number of EMDEs through it Generalized System of Preferences (GSP) and African Growth Opportunity Act (AGOA) which cover about 3.3 percent of U.S. imports (Frazer and Biesebroek 2010; Mattoo, Roy, and Subramaniam 2003).

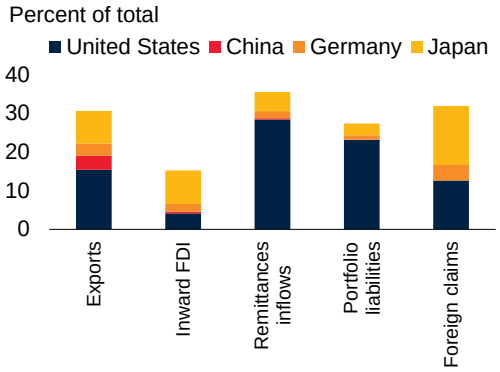
## 2.2 Financial links

The U.S. financial markets are highly integrated with global markets. Following a rapid expansion over three decades, by 2010-14, its international assets and liabilities were on average three times GDP, broadly in line with that of other advanced economies (Figure 2). The United States remains the world's largest source and recipient of foreign direct investment (FDI) flows, accounting for about one-fourth of world FDI inflows and outflows in 2015. The European Union (EU), Japan, Canada and Switzerland together hold about 90 percent of FDI assets in the United States, while the EU and Canada are the largest recipients of U.S. FDI. The countries of the Latin America and Caribbean region are the most exposed to FDI inflows originating in the United States, in particular, Brazil, Chile, and Mexico (Figure 5). Reflecting the size and depth of its financial markets, the United States accounts for the largest share of portfolio assets in one-third of EMDEs.

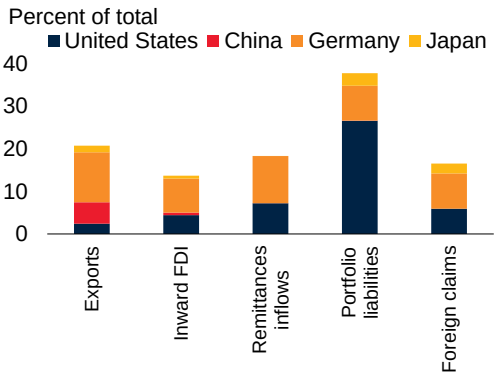
[4]For discussions of the implications of the NAFTA and CAFTA-DR, see De Hoyos and Iacovone (2013); Kose, Meredith and Towe (2005); Kose, Rebucci and Schipke (2005); Lederman, Maloney, and Serven (2005); and Romalis (2007).

Figure 3: Linkages between the United States and EMDE regions

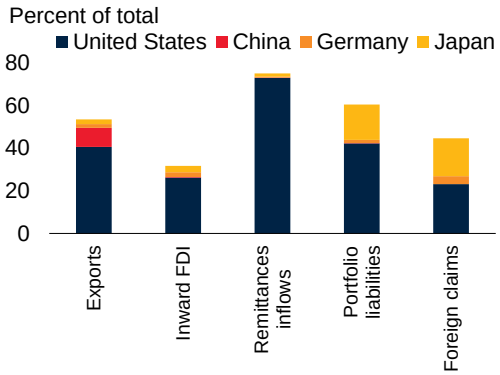
(A) East Asia and Pacific



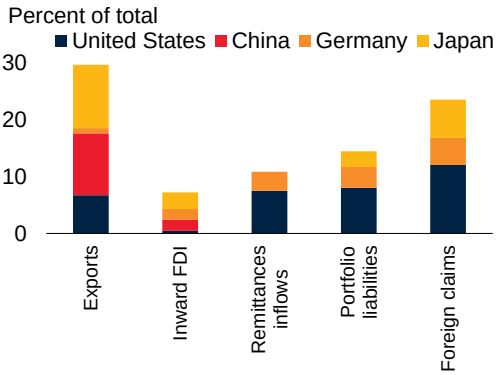

(B) Europe and Central Asia



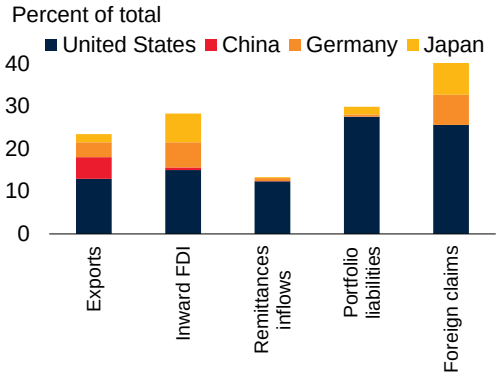

(C) Latin America and the Caribbean



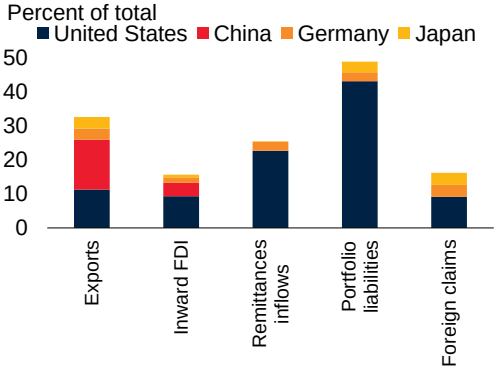

(D) Middle East and North Africa




(E) South Asia




(F) Sub-Saharan Africa

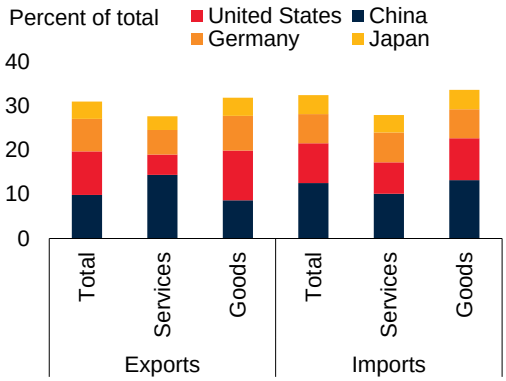



Sources: World Integrated Trade Statistics, Bank for International Settlements, International Monetary Fund, World Bank.

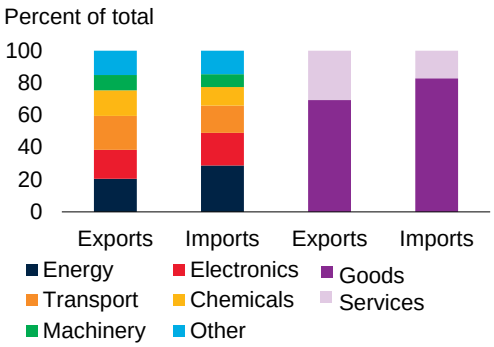
Notes: Averages for 2010-15, except for FDI (2010-14 average). In percent of total exports of each EMDE region, total inward FDI stocks in each EMDE region, total portfolio liabilities (derived from creditor data) in each EMDE region, total foreign claims of BIS-reporting banks on each EMDE region, and total remittance flows to each region.

Figure 4: U.S. trade flows: Composition and partners

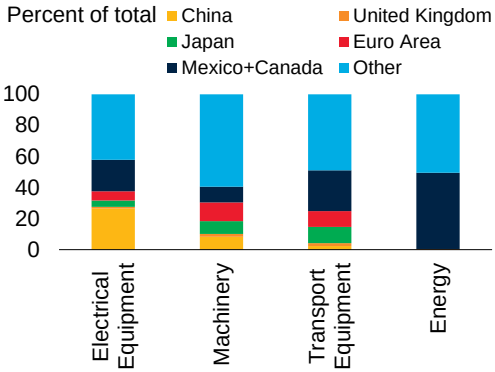
(A) U.S. share of global goods and services trade



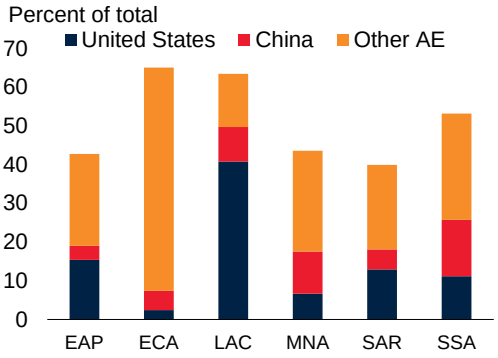

(B) Composition of U.S. exports and imports



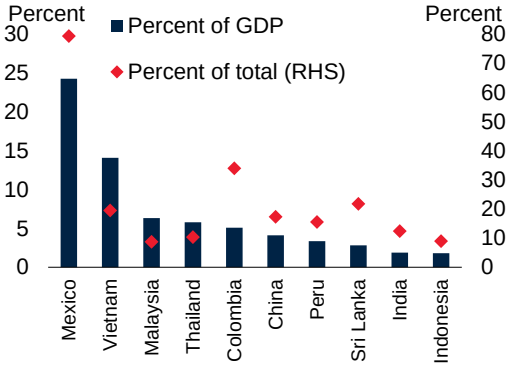

(C) Main sources of U.S. imports



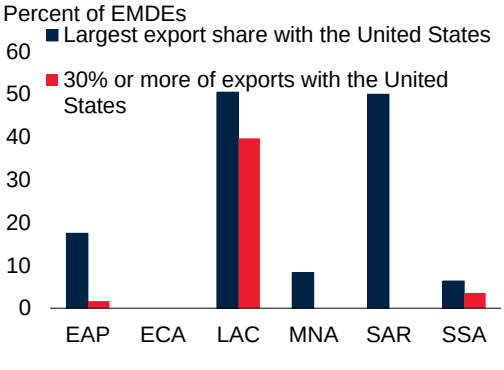

(D) Exports destinations of EMDE regions




(E) Selected EMDEs: Exports to the United States




(F) Share of EMDEs for which United States is a major export destination




Sources: World Trade Organization, World Integrated Trade Statistics, Bureau of Economic Analysis, IMF, World Bank.
Note: Averages for 2010-15 unless otherwise specified.
A. U.S. imports of goods and services in percent of global goods and services imports.
B. U.S. imports of goods or services in percent of total U.S. imports of goods and services (purple bars); U.S. imports in each sector in percent of total U.S. goods imports (other bars). Averages for 2010-2014.
D. Exports to the United States, other advanced economies, and China in percent of total exports of each EMDE region. "AE" stands for advanced economies.
E. Exports to the United States in percent of total exports or in percent of GDP of each EMDE economy.
F. Share of EMDE economies in each region for which exports to the United States account for the single largest share of total exports or for which exports to the United States account for at least 30 percent of total exports.

The U.S. dollar is the most widely used currency in international trade and financial markets and is the world's preeminent reserve currency. Around 80 percent of EMDE bond issuance and more than 50 percent of cross-border bank flows to EMDEs are denominated in U.S. dollars. Europe and Central Asia is the only EMDE region where the U.S. dollar is surpassed—by the euro—as the currency of denomination for cross-border bank flows. Ecuador, El Salvador, and Panama use the U.S. dollar as their official currency; more than 30 other EMDEs maintain exchange rate pegs against the U.S. dollar. A large share of official foreign exchange reserves (63 percent) are dollar-denominated. The U.S. dollar is widely used in international trade transactions for current account transactions, accounting for about one-third of invoicing for goods and services in Europe and two-thirds in Asia (Goldberg and Tille 2008, 2016; Devereux and Shi 2013).

## 2.3 Commodity market links

The United States is a large producer and consumer of commodities (Figure 6). For example, it has re-emerged as the largest producer of oil and natural gas in recent years, accounting for 13 percent of global oil production (similar to its share in the early 1990s). U.S. production is almost evenly split between natural gas and petroleum, in contrast to the predominantly petroleum-based production of other major hydrocarbon producers such as Russia and Saudi Arabia (EIA 2016). U.S. shale oil production, which tripled during 2009-14, requires little capital investment and can be brought onstream rapidly; hence, it has become a highly flexible source of global oil supply, responding quickly to price changes (Baffes et al. 2016).

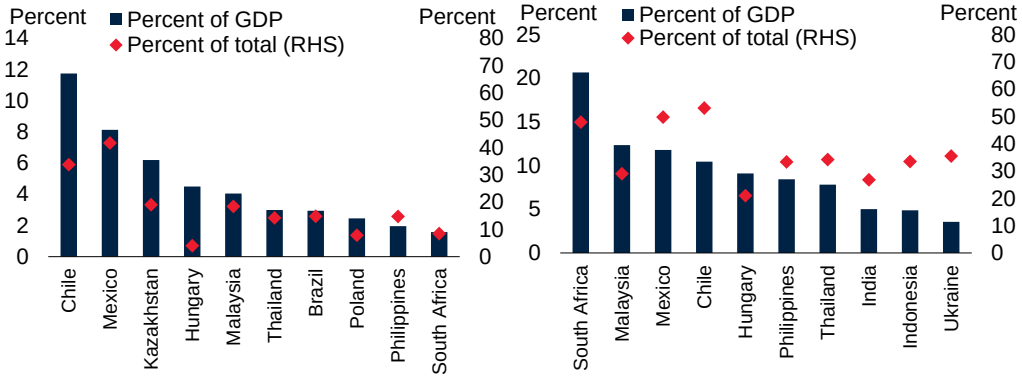
The United States is also the world's largest biofuel producer, accounting for 42 percent of global production. Rapid growth in maize-based production was encouraged by the Renewable Fuel Standard (RFS), mandated by the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, which requires transportation fuel sold in the United States to contain a minimum volume of renewable fuels.

Historically, the United States has been a major consumer of agricultural, energy, and metal commodities. With the rise of large EMDEs, such as China and India, this role has diminished over time (World Bank 2015a). However, the United States is still the largest consumer of natural gas and oil, accounting for more than one-fifth of global consumption. It is the second largest consumer of a wide range of commodities, including aluminum, copper, lead, and coffee.

Figure 5: U.S. financial flows: Composition and partners

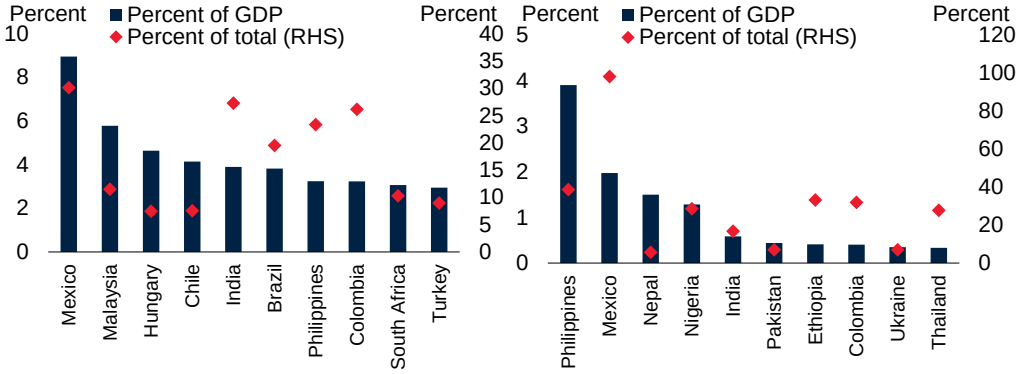
(A) FDI inflows from the United States

(B) Portfolio inflows from the United States




(C) Cross-border bank claims of U.S. banks on selected EMDEs

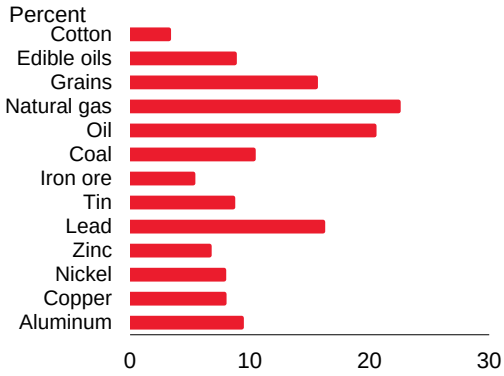
(D) Remittance inflows from the United States



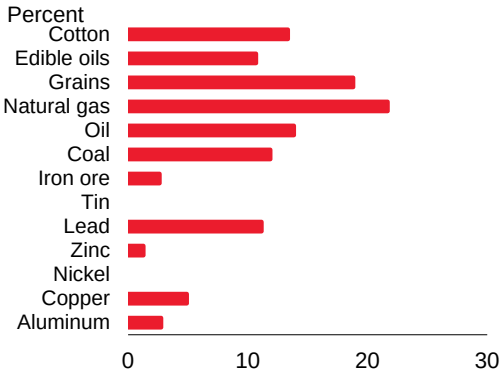

Sources: Bank for International Settlements, International Monetary Fund, World Bank.
A. Share of FDI inflows from United States in total FDI inflows into (and in percent of GDP of) each EMDE, average of 2010-2014.
B. Share of portfolio investment from United States in total portfolio inflows into (and in percent of GDP of) each EMDE, average of 2010-2015.
C. Share of consolidated U.S.-headquartered BIS-reporting banks' claims on each EMDE in total consolidated BIS-reporting banks' claims on (and in percent of GDP of) each EMDE, average of 2010-2015.
D. Share of remittances inflows from United States in total remittances inflows into (and in percent of GDP of) each EMDE, average of 2010-2015.

Figure 6: The U.S. economy and commodity markets

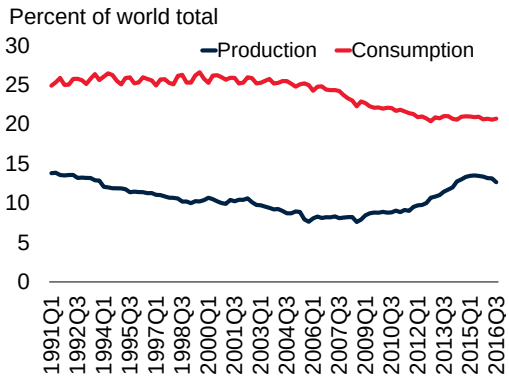
(A) U.S. share of global consumption, 2015



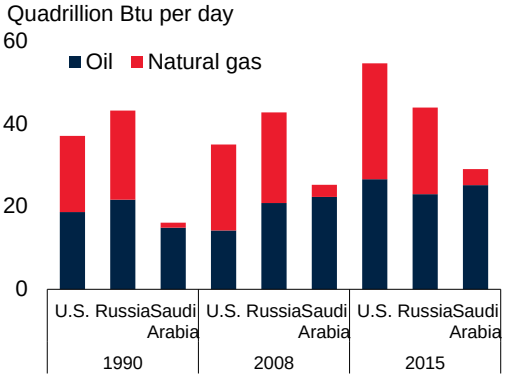

(B) U.S. share of global production, 2015




(C) U.S. share of global crude oil consumption and production




(D) Oil and gas production, 2015




Sources: Haver Analytics, World Bank, BP Statistical Review of World Energy Efficiency, U.S. Energy Information Administration.

A.B. Data for metals represent refined consumption and production. Iron ore consumption is estimated with crude steel production. Grains include wheat, maize and rice; edible oils include coconut oil, cottonseed oil, palm oil, palm kernel oil, peanut oil, rapeseed oil and soybean oil. Oil includes inland demand plus international aviation and marine bunkers and refinery fuel and loss. Coal includes commercial solid fuels only, i.e., bituminous coal, anthracite, lignite and brown coal, and other commercial solid fuels. Natural gas excludes natural gas converted to liquid fuels but includes derivatives of coal as well as natural gas consumed in gas-to-liquids transformation.

D. Oil and natural gas production in British thermal units (Btu), assuming that 1 barrel of crude oil is equivalent to 5,729,000 Btu and 1 cubic foot of natural gas is equivalent to 1,032 Btu.

# 3 Synchronization of U.S. and global cycles

## 3.1 Synchronization of business cycles

Business cycles in the United States, other advanced economies and EMDEs have been highly synchronous (Figure 7). This is partly a reflection of the strength of global trade and financial linkages of the U.S. economy with the rest of the world. In addition, it is also a reflection of global shocks that had a common effect on many countries at the same time. Business cycles in the United States are somewhat more correlated with those in other advanced economies than those in EMDEs (with the important exception of Mexico) because of deeper economic integration.

## 3.2 Concordance of cyclical turning points

International business cycle synchronization tends to be particularly strong when the U.S. economy is in recession but, over the phases of the U.S. business cycle, GDP growth in the rest of the world correlates with the U.S. cycle substantially. For example, growth was on average higher in other advanced economies and EMDEs during periods of U.S. expansions than it was when the U.S. economy was in recession. More importantly, although the four recessions the global economy experienced since 1960 (1975, 1982, 1991, and 2009) were driven by a host of problems in many corners of the world, they all overlapped with severe recessions in the United States.[5]

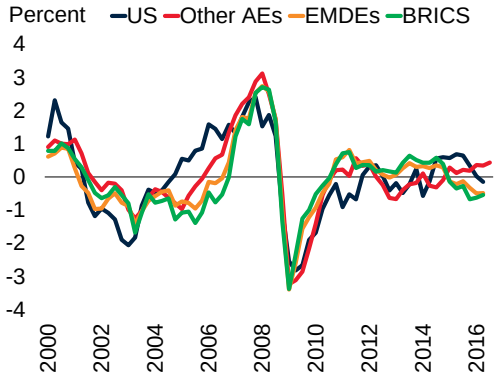
The global recession of 1975 coincided with the beginning of a prolonged period of stagflation, with low output growth and high inflation in the United States. During the 1982 recession, the United States and several other advanced economies experienced a sharp decline in activity along with a steep increase in unemployment in the wake of anti-inflationary monetary policies. The economy again went into recession in July 1990 following a period of depressed activity in the housing market and a credit crunch. The deep global recession of 2009 was driven by the global financial crisis, which had its origins in the U.S. mortgage market but turned into a truly global crisis after the collapse of Lehman Brothers in September 2008. These four U.S. recessions coincided with global recessions; there were, however, four other U.S. recessions post-1960 that did not.

An event study of the last two U.S. recessions, in 2001 and 2009, illustrates the concordance of the turning points of the U.S. business cycle with those of other advanced economies

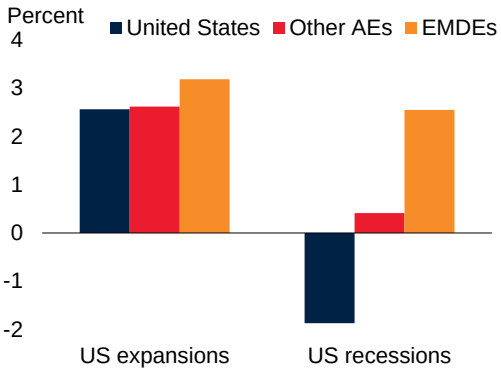
[5]Global recessions are contractions in inflation-adjusted output per capita accompanied by broad, synchronized declines in various other measures, such as world industrial production, employment, trade and capital flows, and energy consumption (Kose and Terrones 2015).

Figure 7: Synchronization of business and financial cycles

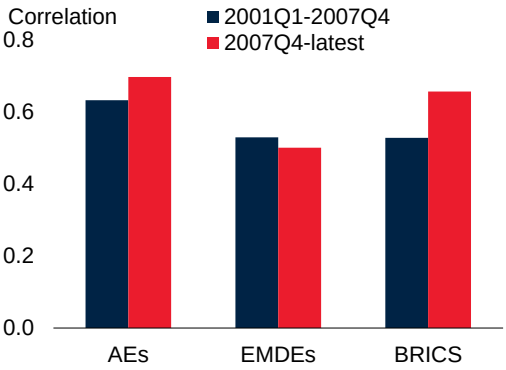
(A) Cyclical component of GDP



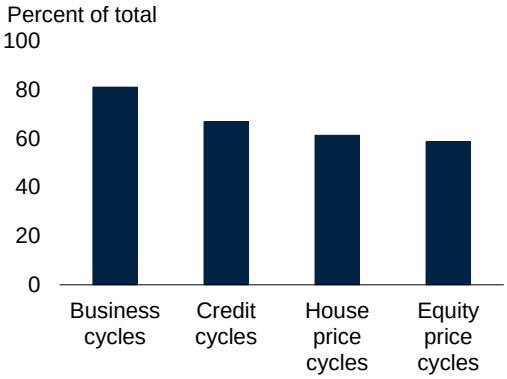

(B) Growth during U.S. business cycles, 1960-2015



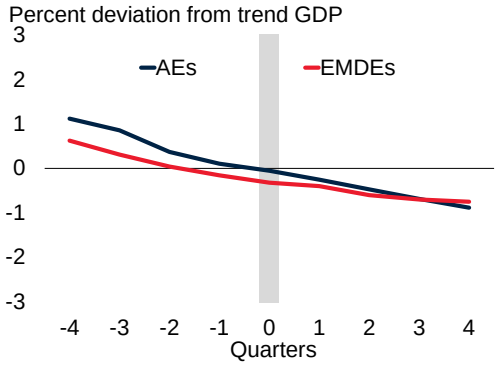

(C) Correlations with U.S. business cycles



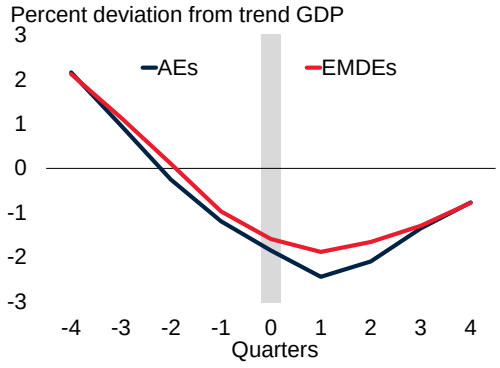

(D) Concordance with U.S. business and financial cycles




(E) Activity around the U.S. recession of 2001




(F) Activity around the U.S. recession of 2009




Sources: Haver Analytics, World Bank, Kose and Terrones (2015), International Monetary Fund.
A. Cyclical component is defined as deviation from Hodrick-Prescott-filtered trend.
B. Annual average per capita growth rates in purchasing power parity during years of expansions and recessions in the United States. Years of expansions and recessions are defined as those with annual positive and negative GDP per capita purchasing power parity growth in the United States, respectively. Other AEs exclude the United States.
C. Contemporaneous correlations between cyclical component of U.S. real GDP and cyclical component of real GDP of advanced economies (AEs) and EMDEs.
D. Average share of years in which business cycles in the United States and all economies were in the same phase. A higher share suggests more synchronization between two countries.
E.F. The graph shows cyclical component of GDP measured as the deviation from trend GDP computed using a Hodrick-Prescott filter on seasonally adjusted quarterly GDP around a trough in U.S. business cycle (t = 0) indicated by the solid bar. Troughs are 2001Q4 and 2009 Q2, defined by the National Bureau of Economic Research. The line refers to median of 35 advanced economies and 51 EMDEs.

and EMDEs (Figure 7).[6] The 2009 recession was particularly severe for the United States whereas the U.S. economy experienced a mild recession in 2001 following the burst of the "dot com" bubble of the late 1990s. In the four quarters leading up to the last two U.S. business cycle troughs, other advanced economies also experienced a decline in the cyclical component of their GDP of, respectively, 0.5 and 4 percent, while their subsequent recoveries have been sluggish. Among EMDEs, slower activity was also observed around these two cyclical troughs.

Concordance statistics illustrate the degree of synchronization between the phases of the U.S. business and financial cycles and those of other economies. Business cycles are more highly synchronized than financial cycles: other countries tend to be in the same business cycle phase (specifically, troughs, peaks, expansions and downturns) with the U.S. cycle roughly 80 percent of the time. While the degree of synchronization of financial cycles with the U.S. financial cycle is lower than that of business cycles, they are quite often in the same phase—about sixty percent of the time for credit, housing, and equity price cycles (Figure 7). While it is difficult to establish empirically whether the U.S. economy leads business and financial cycle turning points in other major economies, recent research indicates that the United States appears to influence the timing and duration of recessions in a number of other major economies (Francis et al. 2015).

# 4 Spillovers from the United States to the global economy

Developments in the U.S. economy have significant impacts on the global economy. Shocks to the U.S. economy transmit to the rest of the world through the range of channels discussed above. An acceleration in U.S. activity can lift growth in its trading partners directly, through an increase in import demand, and indirectly, by strengthening productivity spillovers embedded in trade.[7] Given its sizable role in global commodity markets, an acceleration in U.S. activity tends to lift global commodity demand and raise prices. This supports activity and eases balance of payments pressures in commodity exporters. Financial market developments in the United States may have even wider global implications. Changes in U.S. policies could therefore be expected to affect domestic activity and generate wide-ranging cross-border spillovers through real and financial channels.

[6]Two U.S. business cycle peaks (March 2001 and December 2007) and two U.S. business cycle troughs (November 2001 and June 2009) are identified since 2000 by the NBER's Business Cycle Dating Committee.

[7]For a detailed analysis of the intensity of business cycle linkages between the United States and other countries, see Dées and Vansteenkiste (2007); Stock and Watson (2005); Kose (2003); Kose, Prasad, and Terrones (2004); Jansen and Stokman (2004); Eickmeier (2007); IMF (2007); and Roache (2008).

Independently of growth, policy, or financial market developments in the United States, shocks to confidence of U.S. businesses and consumers can themselves reverberate across borders and be sources of business cycle fluctuations (Levchenko and Pandalai-Nayar 2015). Elevated uncertainty about changes in U.S. policies can reduce incentives to commit to capital investment at home and abroad, and this in turn could adversely affect long-term global growth prospects (Kose and Terrones 2015).

## 4.1 Growth spillovers

U.S. growth shocks are expected to have sizable effects on activity in the rest of the world. Our estimates show that a 1 percentage point increase in U.S. growth could lift growth in advanced economies by 0.8 percentage point and in EMDEs by 0.6 percentage points after one year, while global growth (excluding the United States) could rise by 0.7 percentage point (Figure 8).[8] Growth spillovers reported here are based on a Bayesian vector autoregression model with Cholesky ordering based on a sample that covers other AEs includes such as the Euro Area (19 countries), Canada, Japan, and the United Kingdom and 19 EMDEs for 1998Q1-2016Q2. The model includes growth in the United States, other advanced economies, EMDEs and the rest of the world, as well as U.S. 10-year Treasury yields and emerging market bond spreads (World Bank 2016a; World Bank 2017).

The impact of U.S. growth shocks on investment in these economies would be approximately twice as large. NAFTA members (Canada and Mexico) would particularly benefit from trade spillovers (Yifan and Abeysinghe 2016). Terms of trade effects through commodity markets would be another transmission channel (World Bank 2016b).

## 4.2 Financial market spillovers

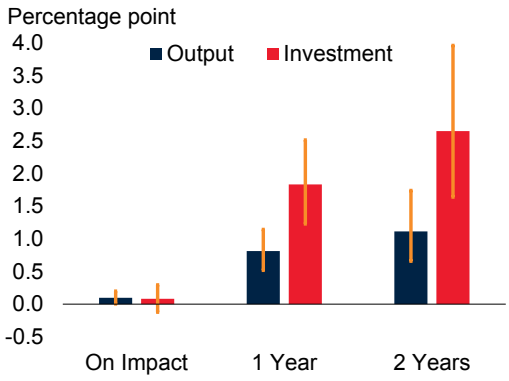
The role of the United States in global financial markets goes well beyond direct capital flows to and from the United States.[9] U.S. bond and equity markets are the largest and most liquid in the world. Swings in U.S. sovereign bond yields are often closely mirrored in other large financial markets. Similarly, cross-border spillovers from U.S. equity markets are significant and depend more on openness to the global economy than on the size of actual

[8]This estimate for advanced economies is in line with other estimates for Canada (Swiston and Bayoumi 2008). For Mexico and Caribbean economies with strong economic ties to the United States, considerably larger spillovers in excess of 1 percentage point have been estimated (Sun and Samuel 2009; Swiston and Bayoumi 2008).

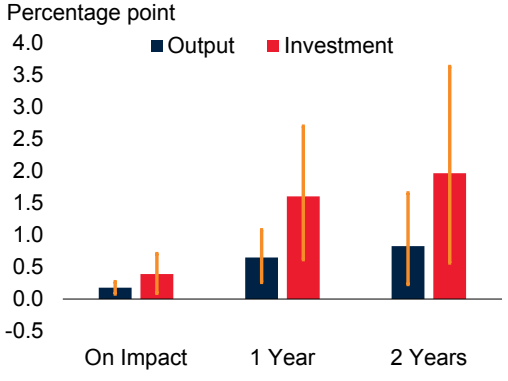
[9]See Berkmen et al. (2012); de Grauwe and Yi (2016); Frankel and Saravelos (2012); Helbling et al. (2011); Metiu, Hilberg, and Grill (2015).

Figure 8: Spillovers from U.S. growth shocks

(A) Output and investment growth in other advanced economies




(B) Output and investment growth in EMDEs




Sources: World Bank; Haver Analytics; OECD.
Note: Figures reflect cumulative impulse responses of weighted average other AE and EMDE GDP growth to a 1 percentage point increase in growth in real GDP in the United States. Growth spillovers are based on a Bayesian vector autoregression of global GDP growth excluding the United States and other AEs or EMDE, U.S GDP growth, the U.S. 10-year sovereign bond yield plus JP Morgan's EMBI index and AE or EMDE GDP growth. The oil price is assumed to be exogenous. Bars represent medians, and error bars 16-84 percent confidence bands. The Sample for other AEs includes Euro Area (19 countries), Canada, Japan, and the United Kingdom and 19 EMDE for 1998Q1-2016Q2.

bilateral portfolio flows (Ehrmann, Fratzscher, and Rigobon 2011; Rose and Spiegel 2011). This makes U.S. monetary policy and investor confidence important drivers of global financial conditions (Ehrmann and Fratzscher 2009; Arteta et al. 2015; Rey 2015).

Because of its predominant use in global trade and financial transactions, broad-based U.S. dollar exchange rate movements have global implications. Episodes of U.S. dollar appreciation tend to coincide with bank deleveraging, tighter global financial conditions, greater incidence of financial crises and subdued EMDE growth.[10] Although the share of private and public debt denominated in foreign currency has declined since the 1990s, the exposure of some EMDEs to foreign currency movements is still high, especially in commodity exporters, as well as importers that have received large capital inflows after the global financial crisis (Arteta et al. 2016). If the U.S. dollar goes through a period of significant appreciation,

[10]See Bruno and Shin (2015a and b); IMF (2015a and b); Druck, Magud, and Mariscal (2015); Abbate et al. (2016).

previous experience indicates that EMDEs with substantial short-term dollar-denominated debt could become vulnerable to rollover and interest rate risks and to a drying up of foreign exchange liquidity.[11]

## 4.3 Monetary policy spillovers

Changes in U.S. monetary policy have sizable cross-border effects through their impact on domestic activity and global financial markets, including currency and asset markets. In the aftermath of the global financial crisis, highly accommodative monetary policies in advanced countries have coincided with an acceleration in capital inflows to EMDEs. In turn, higher U.S. interest rates could reduce such flows, especially those intermediated by banks, and push up global interest rates.[12]

Although actual or expected changes in U.S. monetary policy have significant impacts on U.S. and global long-term yields, the implications for EMDEs would likely depend on underlying drivers. A panel vector autoregression model is used to analyze the differentiated effects on EMDEs of "real" and "monetary" shocks driving U.S. long-term bond yields (Arteta et al. 2015).[13] The model includes EMDE industrial production, long-term bond yields, stock prices, nominal effective exchange rates and bilateral exchange rates against the U.S. dollar, and inflation. Monetary and real shocks are considered exogenous regressors.

Results show that if a rise in long-term U.S. yields is supported by prospects of a strengthening U.S. economy (a favorable "real shock"), the net effect for EMDEs could be positive (Figure 9). In particular, it could bolster equity valuations and activity, and lead to less pronounced currency pressures. Alternatively, if financial markets are surprised by prospects of a less accommodative stance of U.S. monetary policy, one that is not supported by strengthening growth, this could have adverse consequences for EMDEs through asset price and capital flow channels (an adverse "monetary shock"). Financial stress associated with such a change could combine with domestic fragilities and increase the risks of sudden stops in capital inflows to more vulnerable EMDEs.

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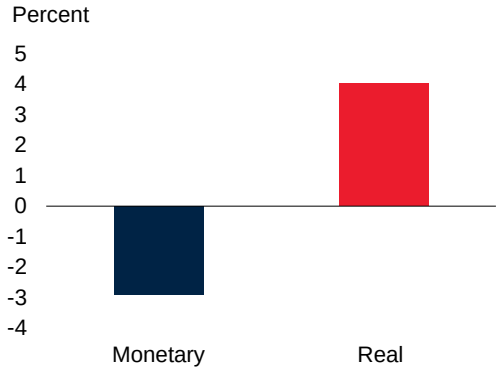
[11] See Chow et al. (2015); Chui, Fender, and Sushko (2014); McCauley, McGuire, and Sushko (2015).

[12] See Ammer et al. (2016); Glick and Leduc (2013); Georgiadis (2015); Borio and Zhu (2012); Bowman, Londono, and Sapriza (2015); Bruno and Shin (2015a); Neely (2015).

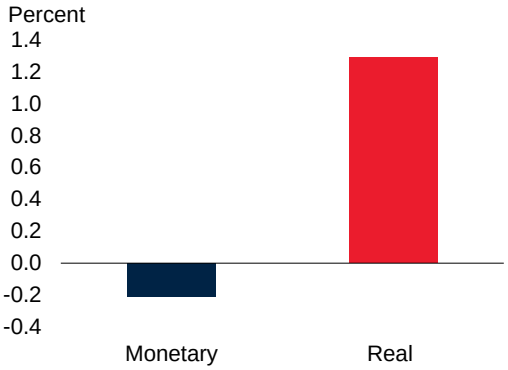
[13] An adverse monetary shock is assumed to increase long term yields and reduce stock prices in the United States, while a favorable real shock is assumed to increase both long-term yields and stock prices in the United States. The decomposition is derived from a structural vector autoregression with sign restrictions (Arteta et al. 2015).

Figure 9: Spillovers from U.S. interest rate shocks to EMDEs

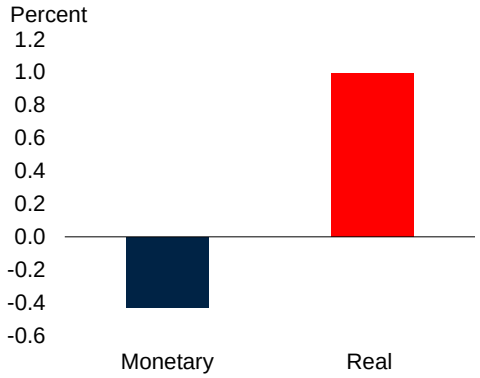
(A) Impact of rising U.S. long-term yields on EMDE equity prices



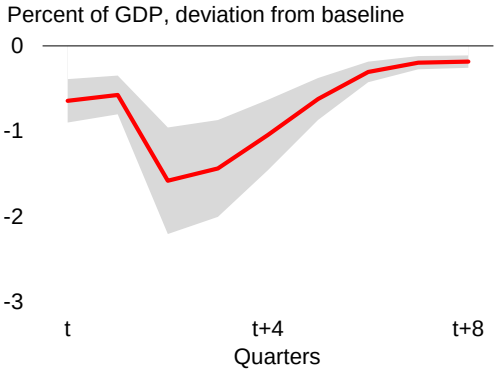

(B) Impact of rising U.S. long-term yields on EMDE industrial production




(C) Impact of rising U.S. long-term yields on EMDE real exchange rate




(D) Impact of interest rate shock in four major economies on EMDE capital flows




Sources: Haver Analytics, Bloomberg, World Bank.
A.B.C. Impulse responses were derived in two steps. First, "real" and "monetary" shocks are identified using a structural vector autoregression with sign restrictions, assuming that an adverse U.S. monetary shock increases long-term yields and reduces stock prices in the United States, while a favorable U.S. real shock increases both yields and stock prices. Second, "real" and "monetary" shocks are included as exogenous regressors in a separate vector autoregression model including EMDE industrial production, long-term bond yields, stock prices, nominal effective exchange rates and bilateral exchange rates against the U.S. dollar. Based on a sample of 23 EMDEs and estimated over the period January 2013-September 2015.
D. Figure shows the impulse response of capital inflows to 64 EMDEs, according to a six-dimensional vector regression model linking capital inflows (including foreign direct investment, portfolio investment and other investment as a share of GDP), to quarterly real GDP growth in both EMDE and G4 countries (United States, Euro Area, Japan and the United Kingdom), real G4 short-term interest rates (three-month money market rates minus annual inflation measured as changes in GDP deflator), G4 term spread (10-year government bond yields minus three month money market rates), and the VIX index of implied volatility of U.S. SP 500 options. The 100 basis point shock on the U.S. term spread was applied to the model assuming a range of pass-through rates to Euro Area, U.K. and Japanese bond yields, from zero to 100 percent. Grey area shows the range of estimated effects on capital inflows depending on pass-through rates (the lower bound corresponds to a zero pass-through rate implying a 40 basis points shock to global bond yields, while the upper bound corresponds to a 100 percent pass-through rates, or a 100 basis points shock to global bond yields). In the median case, global bond yields increase initially by 70 basis points.

The ultimate impact on capital flows of unexpected U.S. monetary policy tightening (beyond one warranted by strengthening U.S. activity) would also depend on the reaction of long-term yields in other major advanced economies, and in particular how market participants reassess monetary policy expectations in these economies. Effects would be amplified if it coincided with synchronized increases in long term yields across G4 economies (United States, Euro Area, Japan, and the United Kingdom), but would be dampened if long term yields only increase in the United States.

A 100 basis point increase in long-term U.S. bond yields could reduce capital flows to EMDEs by 20-45 percent, with the upper bound of this range reflecting simultaneous increases in long term yields across G4 economies. These results are derived from a vector autoregression model including capital flows to EMDEs (foreign direct investment, portfolio investment, and other investment as a share of GDP), quarterly real GDP growth in EMDEs and G4 countries, real G4 short-term interest rates, G4 term spread, and the VIX index of implied volatility of U.S. S&P 500 options (Arteta et al. 2015).

## 4.4 Fiscal policy spillovers

Changes in U.S. fiscal policy could generate international spillovers by affecting U.S. demand for imports from abroad, by causing exchange rate movements or by influencing international borrowing conditions. Simulations using the Federal Reserve Board's model (FRB/US) suggest that a fiscal stimulus of 1 percent of GDP could be expected to raise U.S. growth by between 0.7 and 1.5 percent after two years (World Bank 2017; Brayton, Laubach and Reifschneider 2014). However, the effectiveness of fiscal stimulus in lifting U.S. growth over the short and medium run depends critically on the circumstances of its implementation.

Fiscal multipliers—the additional output generated by an additional U.S. dollar of government spending or tax cut—depend on the presence of economic slack, the reaction of monetary policy, and the nature of the fiscal measures (Laforte and Roberts 2014; Brayton, Laubach, and Reifschneider 2014; Whalen and Reichling 2015). In particular, fiscal stimulus measures could be expected to have different effects if they take the form of tax cuts or measures to bolster government spending and infrastructure investment.

The short-term fiscal multiplier associated with corporate tax cuts is generally estimated to be below one, although considerable uncertainty surrounds these estimates (Chahrour, Schmitt-Grohé, and Uribe 2012; Ljungqvist and Smolyansky 2016; Whalen and Reichling 2015). Regarding personal income tax cuts, empirical studies find that fiscal multipliers vary considerably, from 0.3 and 1.5 (Whalen and Reichling 2015). The effect on growth depends

notably on the structure of the tax cuts and as well as the way in which they are financed (Gale and Samwick 2016; Zidar 2015).

Public infrastructure spending is generally estimated to have larger short-term effects on U.S. activity, with fiscal multiplier comprised between 0.4 and 2.2 (Auerbach and Gorodnichenko 2012; Bivens 2014; Whalen and Reichling 2015). This reflects the direct impact of public investment on aggregate demand, a relatively low import content of infrastructure spending and positive effects on private investment and productivity.

Fiscal loosening in the United States could have positive cross-border spillover effects, raising U.S. demand for trading partners' exports and hence leading to faster global growth in the near-term. However, some factors could mitigate these positive effects, including offsetting cuts in government spending and fluctuations in exchange rate and financing conditions.

Further dollar appreciation associated with fiscal stimulus measures in the United States could trigger financial stability concerns in economies with elevated U.S.-dollar denominated liabilities. Empirical evidence of the impact of U.S. fiscal policy on the strength of the U.S. dollar is mixed, however.[14] If U.S. fiscal stimulus leads to a higher level of U.S. public debt in the long-term, this could also cause an increase in global interest rates and be a source of adverse cross-border spillovers through tightening financial conditions (Cardarelli and Kose 2004).

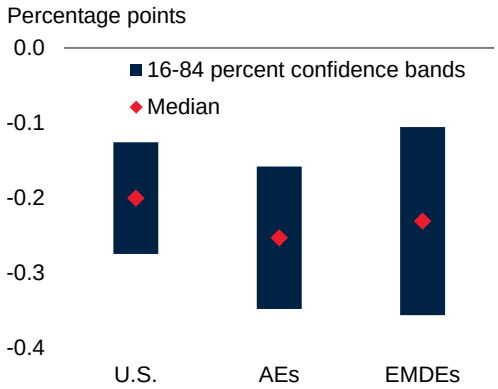
## 4.5 Uncertainty spillovers

Increased uncertainty driven by financial market volatility or ambiguity about the direction and scope of policies could discourage investors in the United States and elsewhere that base their decisions about long-term investments on stable financing conditions and predictable policies. Sustained increases in financial market uncertainty, e.g., as captured in the implied volatility of the U.S. stock market (VIX), could set back output and investment growth in the United States, other advanced economies and EMDEs (Carriére-Swallow and Céspedes 2013; Bloom 2009). In particular, a 10 percent increase in the VIX could reduce average EMDE output growth by about 0.2 percentage point and EMDE investment growth by about 0.6 percentage point after one year (Figure 10). These estimates are based on a vector autoregression model including the VIX index, emerging market equity prices, emerging market bond spreads, and GDP and investment growth in 18 EMDEs (World Bank 2017). The impact on other advanced economies would be broadly comparable.

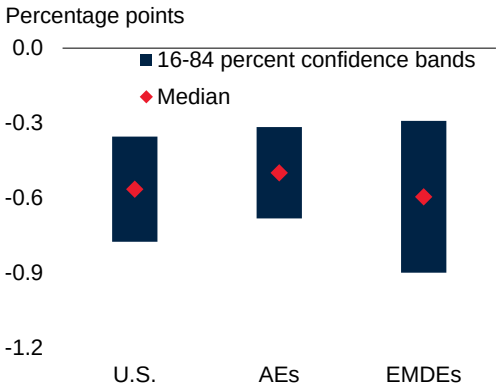
[14] See Enders, Müller, and Scholl (2011); Ravn, Schmitt-Grohé, and Uribe (2012); and Corsetti, Meier, and Müller (2012); Forni and Gambetti (2016); and Auerbach and Gorodnichenko (2016).

Figure 10: Spillovers from U.S. uncertainty shocks

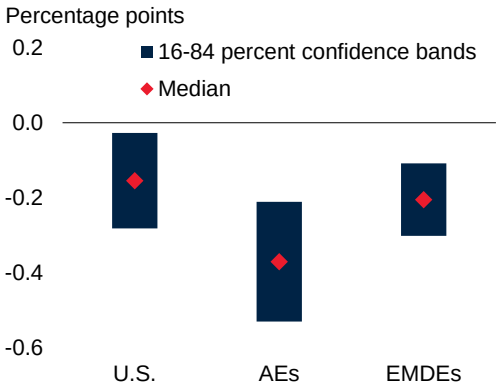
(A) Impact of 10-percent rise in VIX on output growth



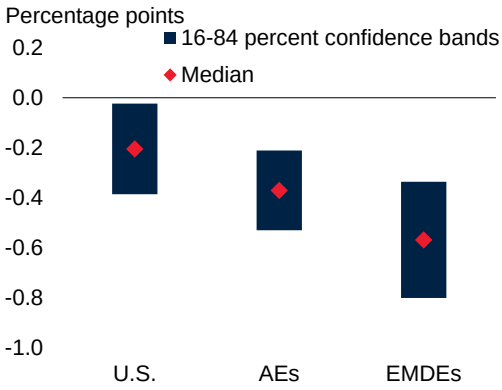

(B) Impact of 10-percent rise in VIX on investment growth




(C) Impact of 10-percent rise in U.S. EPU on output growth




(D) Impact of 10-percent rise in U.S. EPU on investment growth




Sources: Haver Analytics, OECD, World Bank estimates.
Note: Figures reflect cumulative impulse responses after one year on output and investment growth in the United States, 23 other AEs, and 18 EMDEs to a 10-percent increase in the VIX and U.S. EPU. Vector autoregressions were estimated for 1998Q1-2016Q2 with two lags. The model for the U.S. includes, in this order, uncertainty index (VIX or U.S. EPU), U.S. stock price index (SP 500), U.S. 10-year bond yields, U.S. real GDP, and investment growth. The model for AEs includes uncertainty indexes (VIX or U.S. EPU), MSCI Index for advanced economies (MXGS), U.S. 10-year bond yields, aggregate real output, and investment growth in 23 other AEs. The model for EMDEs includes uncertainty indexes (VIX or U.S. EPU), the MSCI emerging market equity price index, J.P. Morgan Emerging Market Bond Index (EMBIG), aggregate real output and investment growth in 18 EMDEs. G7 real GDP growth, U.S. 10-year bond yields, and the MSCI world equity price index are added as exogenous regressors.

Financial market volatility does not necessarily coincide with policy uncertainty, yet both appear to be detrimental to investment. Policy uncertainty is measured by the Economic Policy Uncertainty Index (EPU), a news-based measure of policy uncertainty (Baker, Bloom and Davies 2015). A sustained 10 percent increase in the index of U.S. EPU could, after one year, reduce U.S. output growth by about 0.15 percentage point, EMDE output growth by 0.2 percentage point, and EMDE investment growth by 0.6 percentage point (Figure 10). Similar to the results presented above, these estimates are based on vector autoregression models including the U.S. EPU, equity prices, bond yields, and GDP and investment growth in the respective economies for 18 EMDEs for 1998Q1-2016Q2 (World Bank 2017).

# 5 Spillovers to the United States from the global economy

Important as the U.S. economy is to the global economy, the U.S. economy is also affected by the strength of its linkages with the rest of the world (Figure 11). Moreover, global economic and financial developments play an important role in driving activity and financial markets in the United States.

## 5.1 Global trade

In 2015, trade accounted for more than one-quarter of U.S. GDP (28 percent) and manufacturing output for slightly more than one-fifth (22 percent) of GDP. Most U.S. goods exports are manufacturing goods (87 percent of U.S. goods exports), followed by agricultural products (4 percent) and oil, gas and minerals (2 percent). The most prominent goods export categories are petroleum oils (other than crude), motor vehicles and their parts, and electronic parts. Most U.S. goods and services exports are shipped to Canada, the EU, Mexico, and China, which altogether account for more than 60 percent of total U.S. exports. Export-intensive industries in the United States have tended to be more productive and offered higher wages than non-export-intensive industries: during 1989-2009, on average, their total factor productivity growth was 51 percent higher; labor productivity was 10 percent higher; and wages were 17 percent higher (Council of Economic Advisors 2015).

## 5.2 Global value chain participation

Many U.S. companies are deeply integrated into global supply chains. As a result, U.S. exports themselves are often an input into other countries' production for exports ("forward participation"). One-quarter of U.S. exports represents U.S. value added embodied in other countries' exports. Such forward participation is particularly high in chemicals, business services, and electronics, and with China, Canada, and Mexico. "Backward participation" is

more limited: the average import content of U.S. exports was 13 percent in 2014, well below the average for other advanced economies (27 percent). However, in some U.S. industries, imports account for more than 20 percent of inputs. These include apparel and leather products, motor vehicles, and computers and electronics (U.S. International Trade Commission 2011). Imports are often essential components that do not have readily available domestic substitutes.

## 5.3 Multinational corporations

Much global value chain activity is conducted through U.S. multinational corporations and their affiliates abroad. Although U.S. multinationals account for less than 1 percent of the total number of U.S. firms, since 1990, they accounted for one-third of U.S. real GDP growth and almost half of U.S. labor productivity growth (McKinsey Global Institute 2010). As part of global supply chains, U.S. multinationals rely heavily on exports and imports; in fact, the largest U.S. exporters are multinationals (Moran and Oldenski 2016). Multinationals' presence in financial markets is large; for example, they account for about 85 percent of the stock market capitalization of the S&P500.

About 43 percent of total U.S. trade occurs within multinational firms (intra-firm trade), especially in the case of U.S. trade with advanced economies. Since the global financial crisis, intra-firm trade has continued to grow robustly (especially with EMDEs) whereas arm's-length trade has slowed sharply. Access to foreign markets has also benefited domestic U.S. activity. For example, a 10 percent increase in foreign direct investment by U.S. multinationals abroad was accompanied by 2.6 percent greater domestic investment in the United States (Desai, Foley, and Hines 2009). In turn, foreign multinationals operating in the United States provided 10 percent of U.S. employment and 19 percent of U.S. exports, on average, during 2010-13 (Figure 11).

## 5.4 Global finance

Financial linkages between the United States and the rest of the world, including emerging market economies, have grown rapidly over the past decade, potentially leading to two-way spillovers. Financial market stress or sharp growth slowdowns in the rest of the world can put pressure on the U.S. financial system (IMF 2013; 2014). For example, financial stress that raises risk premia and widens output gaps by 1 percent in some major economies, could widen the U.S. output gap by 0.1-0.35 percent (IMF 2013).

A significant appreciation of the U.S. dollar, which could be driven by increasingly divergent monetary policies with other reserve currencies, weakening growth prospects in the rest

of the world, or relatively sizable fiscal stimulus in the United States, could have a negative impact on U.S. growth as well. For example, a 10 percent appreciation of the trade-weighted U.S. dollar, could reduce U.S. GDP from baseline by over 1 percent after three years, assuming no change in monetary policy (Fischer 2015). The adverse effect would materialize only gradually, with over half of the impact occurring after more than a year. Monetary policy accommodation could substantially ease the impact of a strengthening dollar to about one-half to two-thirds of its direct trade effect.[15]

## 5.5 Consumer and labor markets

About one-third of U.S. consumer spending is on goods, of which about one-sixth is on imported goods. The share of imports in consumption expenditures is larger for durable goods (29 percent)—especially durable household equipment, motor vehicles, and recreational goods—and clothing and footwear (32 percent). The United States hosts the world's largest number of immigrants (Chandy and Seidel 2016). Immigrants accounted for 17 percent of the U.S. civilian labor force, on average, in 2015, and more than one-quarter in some parts of the United States. Immigrants originate from all over the world, but mainly from Mexico, China, and India.[16]

## 5.6 Spillovers from the world to the United States

Because of strengthening multidimensional linkages between the United States and the rest of the world, U.S. business cycles are highly synchronized with the global business cycle. Global developments account for a sizable fraction of variation in business cycles in the United States. According to a dynamic factor model estimated over the period 1985-2015, close to 40 percent of the variance of U.S. growth can be attributable to a global factor (Figure 11; Hirata, Kose, and Otrok 2013; World Bank 2016a).

In addition, growth shocks originating in other economies, especially in other advanced economies, have a significant impact on activity in the United States (Bems, Johnson, and Yi 2010).[17] A vector autoregression model including GDP or industrial production growth in the United States, other advanced economies and EMDEs, as well as 10-year U.S. bond

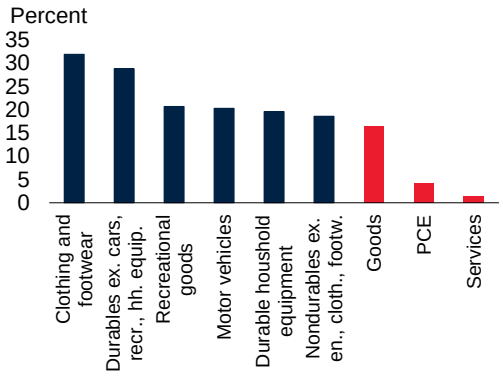
[15]See Erceg, Guerrieri, and Gust (2006); Laforte and Roberts (2014); Brayton, Laubach, and Reifschneider (2014).

[16]Immigration generally appears to raise aggregate wages and lower prices as well as stimulate investment and innovation (Peri 2010; Greenstone and Looney 2012; Hunt and Gaultier-Loiselle 2010; Chellaraj, Maskus and Mattoo 2008).

[17]Some recent studies examine the impact of shocks originating in other countries on activity in the United

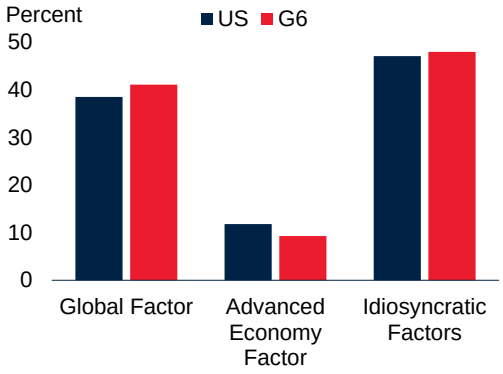
Figure 11: Importance of the global economy for the U.S. economy

(A) Share of imports in U.S. consumption expenditures, 2009

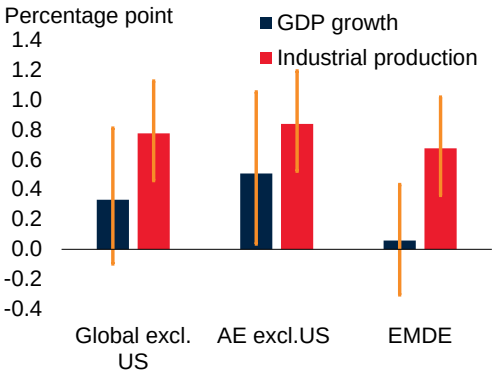



(B) Role of foreign multinational corporations in the United States


(C) Variance share of U.S. and G6 growth




(D) Spillover to United States from 1 percentage point increase in global, other AE and EMDE growth




Sources: Bureau of Economic Analysis, World Bank estimates.
A. Share of imports in U.S. personal consumption expenditures. "Durables ex. cars, recr., hh. equip." stands for durables excluding motor vehicles and parts, recreational goods and vehicles, and furnishings and durable household equipment. "Recreational goods" stands for recreational goods and vehicles. "Durable household equipment" stands for furnishings and durable household equipment. "Motor vehicles" stands for motor vehicles and parts. "Nondurables ex. en., cloth., footw." stands for nondurables excluding gasoline and other energy goods, clothing and footwear. "PCE" stands for personal consumption expenditure and consists of goods and services.
B. Share of multinational corporations in U.S. sales, exports and imports of goods and employment. "Sales" indicates sales of multinational corporations in gross output of U.S. private sector industries. Data covers 2010-2013.
C. The figure reflects the contribution of global, group-specific, and other factors to the variance of GDP growth. A dynamic factor model is estimated over the period 1985-2015, using a sample of 106 countries grouped into three regions: advanced economies (AEs), emerging and frontier markets, and other developing countries. Variance decompositions are computed for each country and, within each country, for output. Each bar represents the variance share of U.S. and G6 (Canada, France, Germany, Italy, Japan, Russia, the United Kingdom and the United States) output growth attributable to the global factor, the AE-specific factor, the country-specific factor and the idiosyncratic term.
D. The figure shows cumulative impulse responses after one year of GDP or industrial production (IP) growth in the United States following a 1 percentage point increase in GDP or industrial production growth in 22 other AEs and 19 EMDEs (13 EMDEs for industrial production). "Global" indicates the weighted average impact of AEs and EMDEs. Vertical lines indicate 16th-84th percentile confidence bands. Vector autoregression models are estimated for 1998Q1-2016Q2 with four lags. The model includes, in this order, global GDP or industrial production growth excluding the United States and AE or EMDE, U.S. GDP or industrial production growth, the U.S. 10-year sovereign bond yield plus JP Morgan's EMBI index and AE or EMDE GDP or industrial production growth. The oil price is assumed to be exogenous.

yields and emerging market bond spreads, points to particularly significant effects of external growth shocks on industrial activity in the United States (World Bank 2017). Furthermore, investment in the United States is increasingly affected by global conditions (Shambaugh 2016).

# 6 Conclusion

The objective of this paper is to fill a gap in the literature by providing a comprehensive overview of the role of the United States in the global economy and quantifying the extent of the global spillovers from changes in U.S. growth, monetary and fiscal policies, and uncertainty in its financial markets and economic policies. Specifically, the paper addresses the following questions:

*What are the major channels of transmission of developments in the U.S. economy to other countries?* The United States is the world's single largest economy: it accounts for roughly one-quarter of global output and about one-tenth of total trade flows. It is also the single largest international creditor and debtor. Given its massive size and the strength of its ties with the global economy, shocks to the U.S. economy are transmitted globally through a variety of channels, including trade, finance, and commodity market linkages.

*How strong are business cycle linkages between the United States and other economies?* U.S. business cycles are highly synchronized with global business cycles. Growth is often higher in the rest of the world during periods of U.S. expansions than it is during U.S. recessions. The four global recessions since 1960 all coincided with severe recessions in the United States.

*How large are global spillovers from shocks originating in the United States?* Shocks to U.S. growth, changes in U.S. fiscal and monetary policies, or uncertainty in U.S. financial markets or policies have significant global spillovers. For example, a surge in U.S. growth can be expected to accelerate activity in the rest of the world. Our estimates suggest that a 1 percentage point increase in U.S. growth could boost growth in other advanced economies by 0.8 percentage point, and in EMDEs by 0.6 percentage point, after one year. Investment could respond even more strongly.

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States (Bayoumi and Swiston 2009; Osborn and Vehbi 2013; IMF 2014; Cashin, Mohaddes and Raissi 2012). For the cyclical spillovers between U.S. and global business cycles, see Kose, Otrok and Whiteman (2008); Dees and Saint-Guilhem (2009); Huidrom, Kose, and Ohnsorge (2016); World Bank (2016a).

In contrast, lingering uncertainty about the direction of U.S. policy could dampen activity and investment abroad. A sustained 10 percent increase in U.S. economic policy uncertainty could, after one year, reduce U.S. output growth by about 0.15 percentage point and EMDE output growth by 0.2 percentage point.

*How important is the global economy for the United States?* Because of its size and reach, the United States is at the center of global trade and financial networks. U.S. multinational corporations and their affiliates abroad are deeply integrated into global supply chains. Financial linkages between the U.S. and the rest of the world, including emerging market economies, have grown rapidly, widening the potential for spillovers in either direction. These two-way channels imply that, important as the U.S. economy is for the global economy, the U.S. economy is in turn affected by developments in the rest of the world.

In a highly integrated global economy, cross-border linkages translate into significant cyclical spillovers. These spillovers have material implications for all countries, irrespective of their size. Understanding these linkages and associated spillovers remains a fertile area of future research.

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