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STOP CURRENCY MANIPULATION AND CREATE MILLIONS OF JOBS

With Gains across States and Congressional Districts

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Six years after the start of the Great Recession nearly 8 million jobs are still needed to return to prerecession labor market health (EPI 2013). Job creation should still be goal number one. Yet prospects for any fiscal policy action to boost jobs have disappeared under the weight of congressional dysfunction, and the Federal Reserve has begun to wind down monetary stimulus (Wall Street Journal 2013). But besides fiscal and monetary policy, there is a third tool of macroeconomic stabilization that could provide a huge boost to economic activity and job growth: realigning exchange rates to lower the U.S. trade deficit. The best part of this solution is that there is broad, bipartisan support for congressional action on this issue. In addition, under existing authority, the president can initiate policies that would make currency manipulation costly and/or futile. Together, these policies could lead to exchange rate movements that would create 2.3 million to 5.8 million jobs over the next three years by ending currency manipulation by a group of about 20 countries, with China as the linchpin. These actions would create jobs in every state and in most or all congressional districts. They would boost GDP, boost jobs and reduce unemployment, and actually *reduce* the federal deficit by spurring economic growth—all without direct budget costs. No other policies could achieve this economic trifecta.

Many of the new jobs would be in manufacturing, a sector devastated by rising trade deficits over the past 15 years. Rising trade deficits are to blame for most of the 5.7 million U.S. manufacturing jobs (nearly a third of manufacturing employment) lost since April 1998. Although half a million manufacturing jobs have been added since 2009, a full manufacturing recovery requires greatly increasing exports, which support domestic job creation, relative to imports, which eliminate domestic jobs. The overall U.S. goods trade deficit did decline slightly in 2012, to $741.5 billion, but the trade deficit in manufactured products increased by $10.2 billion in 2012, threatening manufacturing employment and the overall recovery.

Currency manipulation, which distorts trade flows by artificially lowering the cost of U.S. imports and raising the cost of U.S. exports, is the primary cause of these growing trade deficits.[1] Currency manipulation has increased global trade imbalances by between $700 billion and $900 billion per year, but the United States has absorbed the largest share. Halting global currency manipulation by penalizing or offsetting currency manipulation is the best way to reduce trade deficits, create jobs, and rebuild the economy.

This paper describes the positive effects of ending currency manipulation in three years by estimating the effects of reducing trade deficits on GDP, jobs, the federal budget deficit, and state and local budget deficits in 2015. This study is the first to estimate the job impacts of trade for the congressional districts served by the current 113th Congress, using new congressional districts based on the 2010 Census. Our research shows:

- Eliminating currency manipulation would reduce the U.S. trade deficit by $200 billion in three years under a "low-impact" scenario and $500 billion under a "high-impact scenario." This would increase annual U.S. GDP by between $288 billion and $720 billion (between 2.0 percent and 4.9 percent).
- The reduction of U.S. trade deficits and expansion of U.S. GDP would create 2.3 million to 5.8 million jobs, reducing the U.S. jobs deficit by between 28.8 percent and 72.5 percent.
- About 40 percent of the jobs gained would be in manufacturing, which would gain between 891,500 and 2,337,300 jobs. Agriculture would also gain 246,800 to 486,100 jobs, heavily affecting some rural areas.
- Reducing trade deficits by eliminating currency manipulation would cost the federal government nothing; in fact, increased tax revenues and reduced safety net expenditures would reduce federal budget deficits by between $107

billion and $266 billion in 2015 (34.4 percent to 86.1 percent), and net state and local resources would increase by between $40 billion and $101 billion.

- Each of the 50 states and the District of Columbia would gain jobs in both the low- and high-impact scenarios. Job gains in the low-impact scenario would range from 1.06 percent of state employment in Washington, D.C., to 2.29 percent of employment in Wisconsin. Job gains in the high-impact scenario would range from 2.64 percent in Washington, D.C., to 5.55 percent in Wisconsin.
- Nine of the top 10 states gaining the most jobs (as a share of total employment) in both scenarios are in the Midwest, including six states where manufacturing predominates: Wisconsin (64,700 to 156,600 jobs), Indiana (61,000 to 152,600 jobs), Iowa (34,000 to 79,600 jobs), Minnesota (55,900 to 135,300 jobs), Michigan (82,800 to 207,200 jobs), and Ohio (103,200 to 254,600 jobs); and three states that also benefit from manufacturing and/or agricultural job growth: South Dakota (9,200 to 21,100 jobs); Kansas, a major producer of aircraft and parts (28,900 to 67,000 jobs); and Nebraska (19,000 to 44,200 jobs). In the West, Idaho, a significant employer in computer and electronic parts production (13,900 to 32,700 jobs), rounds out the top 10 states gaining the most jobs.
- Jobs are gained in most congressional districts in the low-impact scenario, and in all congressional districts in the high-impact scenario. In the high-impact scenario, each of the top 20 districts by jobs created as a share of district employment would gain at least 14,700 jobs and as many as 24,400 jobs (gains representing between 5.79 percent and 8.65 percent of total district employment). Of the top 20 congressional districts, five are in California; three are in Wisconsin; two each in Indiana, Ohio, and Michigan; and one each in Kansas, Nebraska, Illinois, Minnesota, Washington, and Iowa. In the high-impact scenario, among *all* districts net job gains range from a low of 6,300 jobs in the 34th Congressional District in California to a high of 24,400 jobs in the 17th Congressional District in California.

The paper reviews the causes of currency manipulation and recommends three steps for bringing it to an end. First, Congress should pass pending legislation (H.R. 1276 and S. 1114) that would allow the Commerce Department to treat currency manipulation as a subsidy in Countervailing Duty trade cases (nearly identical legislation was passed by large majorities in the last three years but never enacted). Second, as a majority of the House has insisted, the proposed Trans-Pacific Partnership (TPP) trade agreement should include "strong, enforceable currency manipulation provisions." Third, the administration must implement strategies that would tax and/or offset purchases of foreign assets by currency manipulating governments, which would make efforts to manipulate the dollar and other currencies costly and/or futile.

Background: Exchange rates, trade, and currency manipulation

Ending currency manipulation is the best possible means available for rebalancing global demand, reflating the U.S. economy, and ending the jobless recovery. Addressing currency manipulation requires understanding how exchange rates are set and the tools available to discourage or offset currency manipulation.

Exchange rates

Exchange rates measure the value of a country's currency relative to other currencies (Nelson 2013). The nominal exchange rate is simply the rate at which one currency can be exchanged for another. On November 1, 2013, one U.S. dollar (USD) could be exchanged for 6.1 Chinese yuan (CNY),[2] 1,060.9 Korean won (KRW), 98.8 Japanese yen (YPY),

or 0.91 Swiss francs (CHF) (Board of Governors of the Federal Reserve System 2013). Exchange rates can be expressed in home or foreign currency units. Thus, the exchange rate between dollars and Chinese yuan on November 1, 2013, can be expressed as 0.164 USD/CNY or, identically, as 6.1 CNY/USD.

If the exchange rate is expressed in terms of USD per unit of foreign currency, then increases in the exchange rate reflect a rising value of the foreign currency, and vice versa. Or put differently, up is up, and down is down. This paper will refer to exchange rates in terms of USD per unit of foreign currency. Thus, an increase in the value of the yuan would be reflected in an increase in the USD/CNY exchange rate.

Exchange rates are used to calculate the value of foreign goods, services, and assets in terms of U.S. dollars. Thus, consumers and businesses in the United States use exchange rates to compute the cost of Japanese and Korean cars in terms of U.S. dollars. In the same way, consumers and businesses in Japan and South Korea use exchange rates to calculate the cost of U.S. cars in Japanese yen or Korean dollars.

Exchange rates are determined by the relative supply and demand for currencies in foreign exchange (FX) markets. The relative demand for currencies is determined by the demand for goods, services, and assets denominated in each currency. Large international capital flows can have a major influence on the relative demand for individual currencies. Trading in global FX markets was $5.3 trillion per day in April 2013, a substantial increase from the $3.3 trillion daily trading average in April 2007 (Nelson 2013, 3). However, a large share of such daily international currency transactions consist of two-way trades in financial derivatives, currency swaps, and other hedging devices that rarely affect market exchange rates.

Recent research has shown that net private financial flows are poorly correlated with the level of exchange rates, an indication that financial markets are not operating efficiently (Gagnon 2013). There are periods, of course, when even private financial flows can be destabilizing and lead to large trade imbalances—and policymakers should certainly have, and be willing to use, tools to fight this. However, the current constellation of trade imbalances is primarily the result of governments that use intentional policies, especially official purchases of foreign assets (public financial flows), to influence exchange rates (Gagnon 2013). This issue is discussed in more detail below.

Effects of exchange rates on trade

The price of all a country's exports and imports are strongly influenced by the exchange rate; it is one of the most fundamental prices in the economy. Therefore, changes in the exchange rate can have a large impact on the level of imports and exports, and on the trade balance. When a country's exchange rate declines, relative to other currencies (a depreciation or devaluation[3]), its exports become cheaper in foreign markets, and imports from other countries become more expensive. Over time, devaluation will increase the level of exports and reduce the level of imports.[4]

Thus, if the Chinese yuan is devalued against the U.S. dollar, Chinese exports become cheaper in the United States, and U.S. exports become more expensive in China. This will increase U.S. imports from China, and U.S. exports to China will fall. A devaluation of the yuan also lowers the relative cost of China's exports in every country where it competes with U.S. exports (and China is the most important competitor of the United States in third-country markets). Thus, devaluation of the yuan by China will also tend to reduce U.S. exports to the rest of the world, and increase the U.S. trade deficit with China and the world as a whole.

Exchange rate regimes and currency manipulation

There are two basic policy approaches countries can take toward exchange rates (Nelson 2013, 4–6). Some countries "float" their currencies, allowing the price or value of the currency to be determined by supply and demand in FX markets. Under a pure floating regime, governments do not "intervene" by taking policy actions to determine or guide the value of their currencies. In 2012, over a third (35 percent) of countries "had floating currencies… includ[ing] major currencies, such as the U.S. dollar, the euro, Japanese yen, and the British pound, whose economies together account for 50% of global GDP" (Nelson 2013, 5).

Other countries "fix" or "peg" their exchange rates, setting a fixed value for their currency relative to another, major currency (such as the U.S. dollar), or relative to a group or basket of currencies, or to a commodity such as gold or silver. The government, usually the central bank, uses a variety of tools to manage the supply of and demand for its currency in FX markets to achieve the target price for the currency. Central banks often "maintain exchange rate pegs by buying and selling currency in international markets, or 'intervening' in FX markets" (Nelson 2013, 4).

Governments usually intervene in FX markets by purchasing foreign assets such as treasury bills, which are usually held by the central bank as FX reserves. Some governments also have sovereign wealth funds (SWFs) which sometimes invest in foreign stocks and other private-market assets (e.g., land, access to natural resources) (Bergsten and Gagnon 2012).

Purchases of foreign assets by central banks and other government agencies, including SWFs, over any period of time, are a key measure of FX intervention. Central banks often report total holdings (stocks) of reserves, including FX, at year-end.[5] Changes in the stock of total reserves are thus used as an indicator of foreign currency intervention. When the People's Bank of China (its central bank) purchases U.S. treasury bills, this increases demand for U.S. dollars, putting upward pressure on the dollar and depressing the Chinese yuan.

Purchases of foreign assets represent a flow of capital out of the investing country. For example, by purchasing U.S. treasury bills, China is lending money to the United States. Legitimate questions have been raised about the wisdom of such loans from a developing country, where rates of return on public and private investment are likely very high, to a large developed country where capital is much more plentiful and interest rates are much lower.

As Nelson (2013) notes, in practice, a few smaller countries use a "hard" peg that anchors the value of the home currency to another, including countries such as Ecuador, which uses the U.S. dollar as its national currency. Overall, in 2012, about 13 percent of countries maintained a hard currency peg, and 40 percent of countries used a "soft" peg, which lets the exchange rate fluctuate within a desired range (Nelson 2013, 5). Many of these countries buy and sell FX reserves and otherwise intervene in capital markets as needed to maintain their exchange rate within a target band.

Defining currency manipulation and differentiating it from quantitative easing

Not all countries that peg their currency are considered currency manipulators. Currency manipulators accumulate growing FX reserves over time, whereas other countries (for example, Brazil or India) both buy and sell reserves, as needed, to maintain the target exchange rate. Currency manipulators also maintain large and growing trade and current-account surpluses, relative to GDP. (The current account is the broadest measure of the overall balance of a country's trade in goods, services, and other income, e.g., profit and interest payments, and outflows, e.g., foreign aid.) According to Bergsten and Gagnon (2012, 5) currency manipulators are countries that meet the following four criteria:

- They held FX reserves that exceeded six months of goods and services imports.
- They maintained a total (global) current-account surplus between 2001 and 2011.
- Their total FX reserves grew faster than their GDP between 2001 and 2011.
- They have gross national income in 2010 of at least $3,000 per capita, the median among 215 countries ranked by the World Bank (this criterion excludes low-income developing economies).

The first criteria accounts for countries that do not maintain a purely floating currency but have valid, precautionary motives for maintaining financial reserves, and a widely accepted standard target for reserves is three months of goods imports (IMF 2011).

These criteria also account for how the growth of international capital flows has made it increasingly difficult for many smaller and developing countries to maintain stable exchange rates, which can be buffeted by changes in underlying business cycle conditions (booms and busts) or by the development of mineral or agricultural resources. These countries have been particularly hard hit by currency manipulation by large trading countries such as China, Korea, and Japan, which has made it difficult for other developing countries to compete in international markets. Dozens of smaller countries have been forced to intervene "on a smaller scale, mainly as a defensive reaction" to remain competitive internationally (Bergsten and Gagnon 2012, 1).

Some countries have complained that quantitative easing (QE) by central banks in large countries such as the United States and United Kingdom, and in the eurozone, has caused their exchange rates to rise (Reuters 2010). However, there is a clear, substantive distinction between QE and currency manipulation. Currency manipulators make large purchases of *foreign* assets, which has the first-order effect of changing exchange rates and influencing foreign demand for a country's output. However, central banks in the United States and the eurozone buy and sell assets *denominated in their own currencies*, with the aim of changing domestic interest rates, which directly affects *domestic* demand. While the interest rate changes do have possible spillover effects on exchange rates, if all countries undertook QE, there would be no net change in exchange rates or trade flows. That contrasts with a situation where one country—say, China—purchases the foreign assets of another—for example, the United States—and does not have open capital markets that allow a reciprocal purchasing of Chinese assets by U.S. investors or the Fed.

Identifying the currency manipulators

Overall, at least 20 to 25 countries that employ a "soft" currency peg are actively managing or manipulating their exchange rates in order to maintain or increase trade and current-account surpluses. But not all of these countries are currency manipulators. Bergsten and Gagnon identify 20 countries that have substantial excess reserves and meet the criteria outlined in the previous section. Collectively, over the last few years, these countries have been investing nearly $1 trillion per year on average in FX reserves to maintain large trade (and current-account) surpluses. Over the past decade, there is a near-perfect correlation between FX purchases by these countries and their collective current-account surpluses (Gagnon 2013, Figure 1).[6]

China is by far the largest holder of total FX reserves, both in terms of the size of its reserve fund and its economic impact on global trade flows. But several other Asian countries and oil-exporting nations, as well as a few countries in Europe, have also intervened heavily in FX markets. Total FX reserves equaled 45 percent of China's GDP at the end

of 2011. The reserve share of GDP was comparable for other currency manipulators such as Switzerland (43 percent) and Malaysia (46 percent). It was substantially higher than the Chinese level in Azerbaijan (53 percent), Qatar (58 percent), Taiwan (83 percent), Saudi Arabia (91 percent), Algeria (95 percent), Norway (113 percent), Hong Kong (118 percent), Kuwait (133 percent), Singapore (187 percent), and the United Arab Emirates (216 percent) (Bergsten and Gagnon 2012, Table 1 at 3).

China's estimated, self-reported, current-account balance fell to 2 percent of GDP in 2012. Other currency manipulators had current-account surpluses that were much larger, relative to output, such as Taiwan (7 percent), Malaysia (8 percent), Switzerland (10 percent), Norway (15 percent), and Singapore (21 percent). Many oil-exporting countries had much larger current-account surpluses, ranging from Saudi Arabia (26 percent) and Qatar (30 percent) up to Kuwait (44 percent) (Bergsten and Gagnon 2012, Table 1 at 3).

However, China dwarfs all other currency manipulators in terms of its total global current-account surplus, and total FX holdings, due in part to the size of its economy. Among all currency manipulators, China had the largest 2012 current-account surplus ($191 billion), as estimated by the IMF (Bergsten and Gagnon 2012, Table 1 at 3). Furthermore, trade data from the United Nations Comtrade program suggest that China has been substantially underreporting its trade and current-account surpluses for at least the last six years. Adding up the bilateral trade balances reported by all of China's trading partners yields annual estimates of China's global goods trade surpluses that for recent years are as much as twice as large as those reported by China, as shown in **Figure A**.

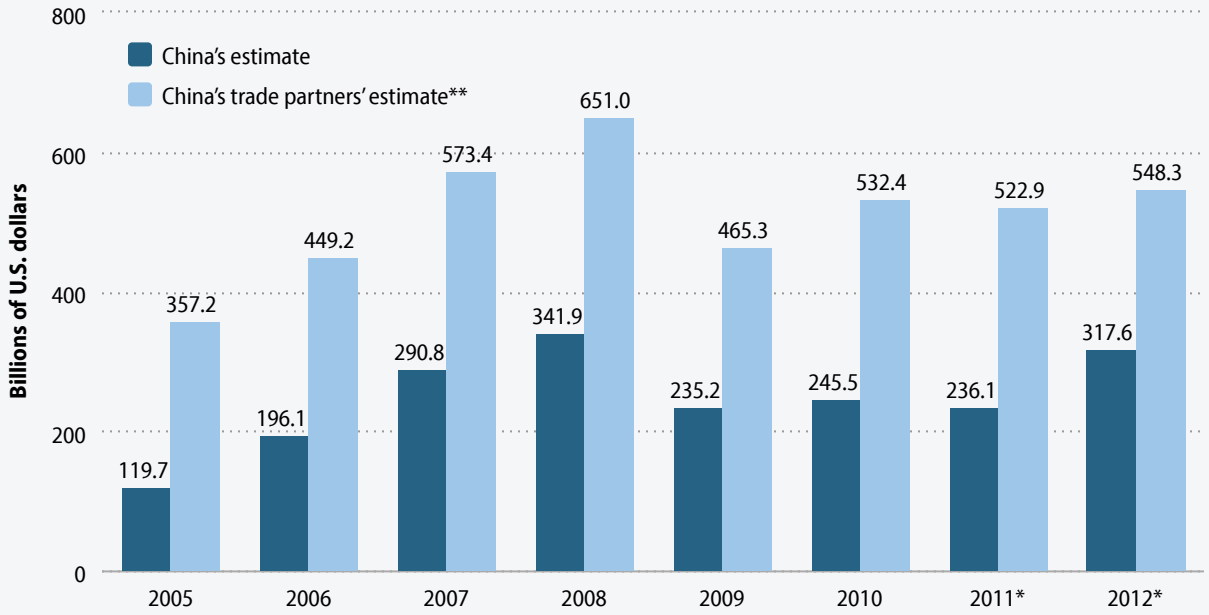
Figure A presents two views of China's goods trade surplus. According to its own trade statistics, China's global goods trade surplus increased from $119.7 billion in 2005 to $341.9 billion in 2008, fell to roughly $235 billion in 2009, and remained roughly constant through 2011 before increasing to $317.6 billion in 2012.[7] Aggregate trade statistics compiled from China's trading partners reveal a very different picture, with China's estimated global goods trade surplus (adjusted for differences in transportation costs) rising from roughly $357 billion in 2005 to $651 billion in 2008, falling to about $465 billion in 2009, and then increasing gradually to $548.3 billion in 2012.[8]

The sharp drop in China's self-reported goods trade surplus shown in Figure A has been used to argue that Chinese currency manipulation is no longer an issue (Krugman 2012). However, the persistence of very large and growing trade deficits with China, as reported by the universe of trading nations, suggests that China has not abandoned its dependence on currency manipulation as a primary engine of its export-led development strategy. Evidence that China's massive trade and current-account surpluses are the result of currency manipulation is provided in **Figure B**.

China's total holdings of total reserves reached $3,262 billion at the end of 2011, nearly three times larger than Japan's total reserves of $1,225 billion (IMF 2013a). China's purchases of FX reserves slowed briefly in 2012, and increased dramatically in 2013. As shown in Figure B, at the end of the third quarter of 2013 (i.e., September 30), China had total additions of reserves of $328.9 billion, with $163.3 billion of those total additions to reserves made in the third quarter alone, bringing total reserve holdings to $3,660 billion as of September 30, 2013 (Silk 2013). In addition, the holdings of China's sovereign wealth fund, the China Investment Corporation, increased from $200 billion in 2007 to $575 billion at the end of 2012, further adding to China's total FX holdings (Silk 2013). Thus China has apparently resumed its interventions in foreign exchange markets, as shown in Figure B, which reports the change in China's total reserve funds in each year, one measure of its annual interventions in foreign exchange markets.

FIGURE A VIEW INTERACTIVE *on epi.org*

China's global goods trade surplus, Chinese vs. trading partner country reports, 2005–2012



*Estimates for 2011 and 2012 are based on incomplete data, with fewer than 152 out of 171 countries reporting.

**The estimates are adjusted for differences in transportation costs, assuming that China pays 10 percent CIF (cost, insurance, and freight) and receives 1/1+.10 in export revenues. See appendix in Scott (2013) for further details on the methodology.

Source: Author's analysis of United Nations Commodity Trade statistics and IMF (2013a)

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Since 2006, China has increased its total reserve holdings by between about $128 billion and $467 billion per year. Between 2006 and 2012, the average increase in reserves was $359 billion per year, and China is on pace to increase reserves by more than $450 billion in 2013 (IMF 2013a; Silk 2013, 2014). Increased reserve holdings reflect net purchases of foreign assets, and about two-thirds of China's total reserves are held in dollar-denominated assets. The steady and massive increase in China's reserves is a capital export from China, one that is depressing the value of the yuan below what it would otherwise be if markets were allowed to determine its value.

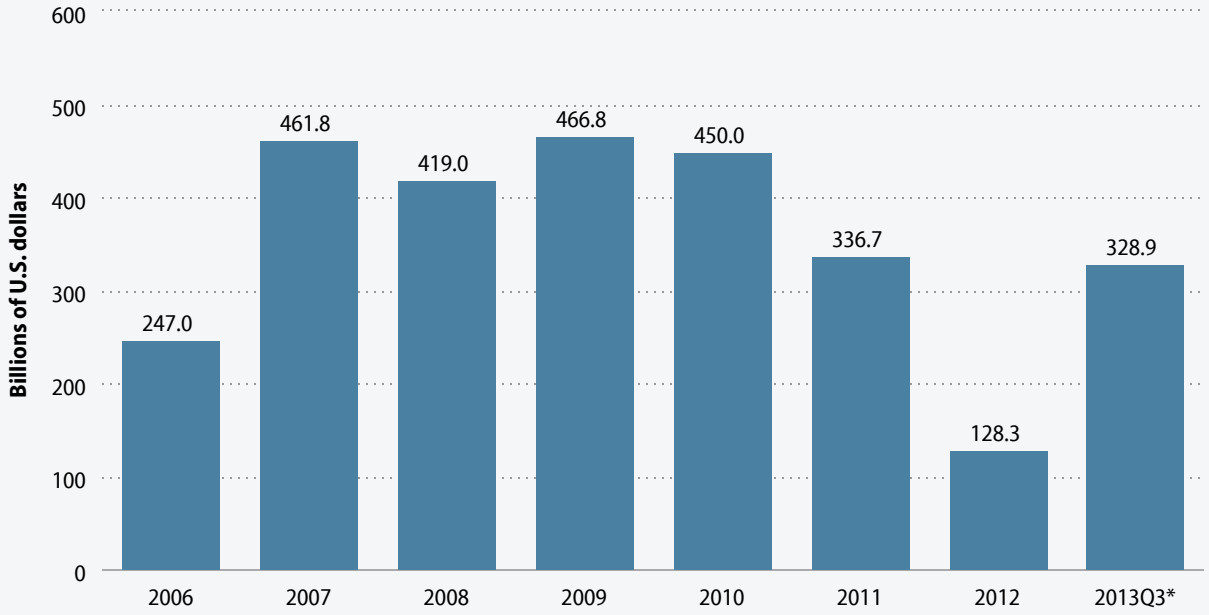
Taken together, Figures A and B demonstrate that China is manipulating its currency to artificially increase its competitiveness and its trade surplus. New economic analysis has shown that there is a strong statistical relationship between large, persistent current-account surpluses and purchases of official reserves, including holdings of foreign assets in sovereign wealth funds (Gagnon 2013).

Currency manipulation can be dealt with

The definition of currency manipulation in the United States has undergone a significant and underappreciated change over the past few years, as a growing number of experts reject the approach codified in U.S. law.

FIGURE B VIEW INTERACTIVE *on epi.org*

Change in China's total foreign-exchange reserves, 2006–2013



*The $328.9 billion figure is through the end of the third quarter and includes data through the second quarter from the IMF (2013a) and data for the third quarter from Silk (2013).

Source: Author's analysis of International Financial Statistics (IMF 2013a) and Silk (2013)

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Recent research on the links between currency intervention and trade flows provides an economic foundation for a new approach to supervision and intervention in FX markets.

Treatment of currency manipulation under U.S. law

The Omnibus Trade and Competitiveness Act of 1988 required the Treasury secretary to issue semiannual reports that consider "whether countries manipulate the rate of exchange between their currency and the United States dollar for purposes of preventing effective balance of payments adjustment or gaining unfair competitive advantage in international trade" (U.S. Department of the Treasury 2013, 2). The act required the president to "seek to confer and negotiate with other countries" (Treasury.gov) if countries were found to be manipulating their currencies for commercial advantage.

This definition created two elements that must be present to justify a finding of currency manipulation, as currently interpreted under the law. First, the Treasury secretary must determine that a currency is "misaligned," or that its value differs from the "fundamental" or "equilibrium" value of the exchange rate (Nelson 2013, 6). Some economists believe that a currency is misaligned when the pegged or managed value differs from "what would be set by the market if it were

allowed to float" (Nelson 2013, 6). Others have argued that the equilibrium value is that level which would restrict or eliminate trade or current-account surpluses (Cline 2013).

The second necessary aspect of currency manipulation as defined under the Omnibus Trade and Competitiveness Act of 1988, Sec. 3004, is the element of intent (U.S. Department of the Treasury 2013, 5). It is not enough to show that a currency's value differs from its equilibrium level; the Treasury must determine that the currency is manipulated to improve the issuing country's trade balance ("balance of payments") or competitiveness.

It is difficult to prove "intent" in the conduct of international exchange rate policy, and this has allowed the Treasury to determine that "no major trading partner of the United States has met the standard of manipulating the exchange rate between their currency and the United States dollar for purposes of preventing effective balance of payments adjustments or gaining unfair competitive advantage in international trade as identified" in the Omnibus Trade and Competitiveness Act of 1988 (U.S. Department of the Treasury 2013, 5).

The new view of currency manipulation

Recent research has shown that there is a strong correlation between aggregate current account (trade) balances and the accumulation of net official foreign assets, through 2010 (Gagnon 2013, 2). In recent years these collective flows ranged between $500 billion and nearly $1 trillion per year, respectively, in the current account and net official asset flows. The key finding of Gagnon's research is that "large current account imbalances…probably would not have occurred, and certainly would not have persisted, without massive official net purchases of foreign assets" (Gagnon 2013, 2). Gagnon estimated that the "implied effect on the current account balance is between 60 and 100 percent of net official flows. This is a much larger effect than is widely assumed" (Gagnon 2013, 17).

This finding suggests that the entire framework for thinking about exchange rate misalignment and the intent to manipulate, as specified in Sec. 3004 of the 1988 trade act, is wrong. Although China's currency has appreciated significantly since 2005, a fact that weighed heavily in the Treasury's analysis, it hasn't appreciated enough. This is true simply because the Chinese government[9] has been investing hundreds of billions of dollars in purchasing U.S. and other foreign assets, and China has been running large (very large, as shown in Figure A) trade and current-account surpluses with the world, and large bilateral deficits with the United States. The proof that the U.S.-China exchange rate should be lower is the high level of capital exports from China. Period.

In the new view, for any country that has significant, sustained current-account surpluses, the growth in FX reserves (or in holdings of foreign assets in SWFs) is sufficient to demonstrate that exchange rates are being manipulated. It is not necessary to specify what the equilibrium exchange rate would be, or to prove that it intended to manipulate for commercial advantage. Under these conditions, intervention is tantamount to currency manipulation.

Gagnon's careful research shows that if large, government purchases of foreign assets are ended, market exchange rates will realign, and large trade and current account imbalances will shrink. This will be good for the United States and other victims of currency manipulation, and for China and other currency manipulators. Trade balances and current accounts in the United States, Europe, and other countries hurt by currency manipulation will improve, creating millions of jobs in those countries. Consumers in China and other currency manipulators will enjoy lower-cost imports and rising standards of living. Currency manipulators will have to shift resources to support domestic, demand-led growth,

but they will have ample public savings to support such investments, especially if they stop investing hundreds of billions of dollars per year in excess purchases of low-return, FX reserves.

Policy tools for ending currency manipulation

China, Denmark, Hong Kong, South Korea, Malaysia, Singapore, Switzerland, and Taiwan are the most significant currency manipulators, and Japan is also a threat, as it has recently announced its intent to intervene in its exchange rate. For decades the United States has pursued diplomatic remedies and ultimately acquiesced as these countries amassed massive stocks of government-owned FX reserves and other foreign assets. There are at least three distinct steps that policymakers should take to confront currency manipulation.

In the short run, the most promising course is for Congress to pass legislation that would more clearly define currency manipulation as an illegal subsidy and authorize the Commerce Department to address currency manipulation in countervailing duty (CVD) complaints. The Ryan-Murphy Currency Reform for Fair Trade Act (H.R. 2378) was approved by the House of Representatives on September 29, 2010 (OpenCongress.org 2010), but the Senate failed to consider a companion measure in the 111th Congress (S. 1027, OpenCongress.org 2009). The bill received a veto-proof 80 percent approval margin, with a vote of 348 to 79, with six abstentions. In the 112th Congress, the Senate passed a similar bill—the Currency Exchange Rate Oversight Reform Act of 2011 (S. 1619), authored by Sen. Sherrod Brown (D-Ohio)—by a margin of 63 to 25 (OpenCongress.org 2011). These bills would revise the Tariff Act of 1930 to include a "countervailable subsidy" that would allow tariffs to be imposed on some imports from countries with a "fundamentally undervalued currency." There is strong bipartisan support for such legislation in Congress.

Nearly identical legislation was introduced in the House and the Senate in 2013. The Currency Reform for Fair Trade Act (H.R. 1276), which was introduced by Rep. Sander Levin (D-Mich.), now has 147 cosponsors (OpenCongress.org 2013b). In the Senate, Sherrod Brown has introduced the Currency Exchange Rate Oversight Reform Act of 2013 (S. 1114), with 17 cosponsors (OpenCongress.org 2013a). Momentum appears to be building for passing this legislation in the near future. Its passage and implementation would increase economic and political pressure on currency manipulators to reform.

The second course of action is to address currency manipulation in future trade agreements. A majority of members of Congress have insisted that the Trans-Pacific Partnership, a proposed trade agreement between the United States and 11 Asian and Latin American nations, include "strong and enforceable currency manipulation provisions" (Michaud 2013). Setting a high bar against currency manipulation in the TPP will set an important precedent for global trade and financial regulations.

Finally, the most effective tool for stopping currency manipulation is to tax or offset the acquisition of FX and foreign assets by currency manipulators. In the case of China, Gagnon and Hufbauer (2011) suggest that "the U.S. government should tax the income (the interest payments) on Chinese holdings of U.S. financial assets." This would discourage China from holding U.S. assets. China currently holds about $2.2 trillion in U.S. Treasury bonds and other government assets. Gagnon and Hufbauer suggest that the U.S. Treasury withhold tax in interest paid on Treasury bonds. With a rate of 30 percent, for every $10 billion in Treasury bond interest paid to China's central bank, the Treasury could withhold $3 billion in taxes. The authors conclude that "taxing Chinese assets would certainly raise hackles in China, yet

Chinese leaders would have no way to retaliate in kind," since the U.S. government does not have significant holdings of Chinese government assets.

Taxing foreign holdings of U.S. Treasury bonds and other U.S. financial assets could be cumbersome and unpopular with foreign governments. As an alternative, Bergsten and Gagnon (2012, 1) suggest that the U.S. government should offset foreign purchases of U.S. financial assets through "countervailing currency interventions." This proposal calls for buying amounts of currencies equal to the amounts being bought by currency manipulating governments.

The United States possesses the policy tools and executive authority to engage in countervailing currency interventions (CCI) against the effects of currency manipulation by other countries that have open capital markets, such as Japan, Hong Kong, South Korea, and other large currency manipulators listed previously. Recently, China has opened an offshore market in Hong Kong for assets issued by the Chinese government and Chinese banks, offering a vehicle for CCI in Chinese assets (Joseph 2013). The Treasury and Federal Reserve should begin to use the authority and resources they already have to offset efforts by the other manipulators to suppress their currencies. In essence, the Fed has unlimited ability to create money to purchase foreign assets in such quantity as to offset any and all currency manipulation by other countries.[10]

Bergsten and Gagnon argue that the United States should cooperatively intervene to end currency manipulation, working in coordination with its trading partners, especially those in Europe and others in the G-20 that have been injured by currency manipulation. This plan may be preferable, from a foreign policy perspective, but it would be exceedingly difficult to implement. It will be much easier to persuade other countries to get tough with currency manipulators if the United States leads the way by mounting a massive, unilateral "countervailing currency intervention" campaign first.

A new, comprehensive approach to estimating the benefits of ending currency manipulation

This paper uses existing research on the effect of currency manipulation on trade deficits to estimate the impact of ending currency manipulation on U.S. trade deficits, GDP, and jobs. It updates a prior EPI report on job gains nationally and in Ohio (Scott, Jorgensen, and Hall 2013) by estimating the job impacts of trade for the congressional districts served by the 113th Congress.

The analyses in this paper, like that in the 2013 paper, start with Bergsten and Gagnon (2012), who found that currency manipulation by about 20 developed and developing countries raised their collective current-account surplus (the broadest measure of their trade balance) by between $700 billion and $900 billion per year in 2011. The estimated corresponding U.S. share of the global trade deficit caused by currency manipulation was $200 billion to as much as $500 billion in that year. The European Area share was an estimated $150 billion to $200 billion in 2011.

Ending currency manipulation could, in turn, improve trade and current accounts in the United States by between $200 billion and $500 billion over the next two to three years. (Bergsten and Gagnon 2012, 7–10)

The increase in net exports would increase manufacturing output and employment, which would have a multiplier effect on output (gross domestic product, or GDP). According to Bergsten and Gagnon, eliminating excessive currency intervention would reduce the U.S. trade deficit by between 1 and 3 percent of GDP. They note that the effect on GDP

would be even larger once "multiplier effects on domestic demand are taken into consideration" (Bergsten and Gagnon 2012, 3). The increase in wages and output would generate increased tax revenues and a decrease in public spending at the federal, state, and local levels as unemployment declines and is accompanied by declining spending on unemployment insurance, food stamps, Medicaid, and other social safety net supports for low-income families.

This paper extends Bergsten and Gagnon's macroeconomic analysis of the effects of trade-deficit reduction to include full consideration of economic multipliers derived from respending of wages as trade deficits are reduced. It uses employment-output relationships estimated by the Congressional Budget Office to project the distribution of jobs gained and lost by industry, and U.S. Census Bureau employment data to estimate jobs gained by state and congressional district. Our analysis focuses on the goods trade deficit, for which there exists the most detailed data on production and employment.[11]

Most traded goods are manufactured products. Between 2000 and 2012, more than two-thirds (68.5 percent) of the U.S. goods trade deficit was composed of manufactured products (USITC 2013), and most of the rest was composed of crude oil. Growing U.S. trade deficits over the past 15 years have eliminated millions of U.S. jobs, with manufacturing particularly hard-hit. Since April 1998, the United States has lost 5.7 million manufacturing jobs (Bureau of Labor Statistics 2013b), nearly a third of manufacturing employment, and most of those job losses were due to the growing U.S. trade deficit. For example, the rise in the U.S. trade deficit with China alone between 2001 and 2011 eliminated 2.7 million U.S. jobs, over 2.1 million (76.9 percent) of which were in manufacturing (Scott 2012).

Although half a million manufacturing jobs have been added since 2009, a full manufacturing comeback has not happened in the recovery from the Great Recession and never happened in the recovery following the 2001 recession. Full recovery requires greatly increasing exports relative to imports, because while exports support domestic job creation, imports (and growing trade deficits) eliminate domestic jobs.

Although the overall U.S. trade deficit declined slightly in 2012, the trade deficit in manufactured products increased by $10.2 billion (USITC 2013). This growing manufacturing trade deficit is a threat to manufacturing employment and the overall recovery.

Currency manipulation by China and other countries, such as Japan and Singapore, is the largest single cause of U.S. trade deficits. China is the most important competitor for U.S. exporters in markets around the world. It is no coincidence that China is also the world's foremost currency manipulator.

The models used in this research

A February 2013 report from the Economic Policy Institute (Scott, Jorgensen, and Hall 2013) employed the IMPLAN (Impact Analysis for Planning) modeling system of MIG, Inc., to estimate the employment effects of ending currency manipulation on the United States and on Ohio. This paper uses a different overall macroeconomic model, one based, in part, on employment-output relationships estimated by the Congressional Budget Office, and updated estimates of the effects of ending currency manipulation on overall GDP and employment, including respending effects. It extends the analysis of the employments effects of reducing goods trade deficits beyond Ohio to include all 50 states and all 436 congressional districts (including the District of Columbia).

As part of our overall model, an input-output (IO) model was used to estimate the distribution of jobs gained and lost by industry. It provides estimates of the direct and indirect labor requirements of producing output in a given domestic industry.[12] The model includes 195 U.S. industries as tracked by the Bureau of Labor Statistics (BLS), 77 of which are in the manufacturing sector (see Appendix A, for details on model structure and data sources). The model estimates the amount of labor (number of jobs) required to produce a given volume of exports and the labor displaced when a given volume of imports is substituted for domestic output. The difference between these two numbers is essentially the number of jobs supported by reducing U.S. goods trade deficits, holding all else equal.

Jobs supported by reducing U.S. trade deficits will directly increase employment in trade-related industries, especially those in manufacturing. The IO model also estimates the number of "indirect" jobs supported in supplier industries, including those in manufacturing, and in related service sectors such as law, accounting, managerial, and temporary help services. Finally, wages supported by new, trade-related jobs in the economy will support additional rounds of "respending" which will have a multiplier effect on output (GDP) and employment.

The trade forecasts used in the models are based on observed trends in goods trade flows in 2011–2012, at the sector level, for each of the 195 BLS industries in the IO model. Rates of growth in real trade at the sector level were used to project trade flows between 2013 and 2015 if currency manipulation ended in 2013, under two scenarios explained in the next section and in Appendix A. A vector of consumer spending in the domestic economy (from the IO final demand tables) is used to estimate the distribution of jobs that will result from respending of wages in the domestic economy (the multiplier effect). Total employment effects of reducing trade deficits, by industry, are estimated as the sum of the direct, indirect, and respending jobs.

These techniques generated estimates of direct, indirect, and respending jobs gained by industry. These results were used with data on the distribution of employment by industry by state and congressional district (discussed below under "Job gains by state and congressional district" and in Appendix A) to estimate the impacts of reducing trade deficits on employment in these areas.

Impact of ending currency manipulation on the U.S. economy and state spending

Each $1 billion in U.S. exports supports some American jobs. However, each $1 billion in U.S. imports displaces the American workers who would have been employed making these products in the United States. The net employment effect of trade depends on the changes in the trade balance. An improving trade balance will, all else equal, support job creation, while growing trade deficits will result in growing net U.S. job displacement. The United States has run trade deficits since 1975, which have increased steadily since the early 1990s, and especially since the Asian financial crisis of 1997–1998, when many Asian currency manipulators experienced sharp depreciations. U.S. trade deficits did contract sharply in 2009, when U.S. trade with all countries collapsed due to the recession of 2007–2009, but they have grown significantly since then.[13]

As this research shows, ending currency manipulation would sharply reduce U.S. trade deficits, creating millions of U.S. jobs over a three-year period. This in turn would provide a considerable boost to federal and state finances.

TABLE 1

Impact of ending currency manipulation, on U.S. economy and state spending, 2015*

Change in 2015	Scenario** Low impact	High impact
Trade deficit (billions of dollars)	-$200	-$500
Gross domestic product		
in annual billions of dollars	+$288	+$720
*as a share of GDP****	+2.0%	+4.9%
Number of jobs	+2,300,000	+5,800,000
Federal budget deficit		
in annual billions of dollars	-$107	-$266
*as a share of federal deficit****	-34.4%	-86.1%
State and local budget funds		
in annual billions of dollars	+$40	+$101
*as a share of state spending****	+2.0%	+4.9%
*as a share of state/local deficits****	-27.4%	-68.4%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

***Percentages shown are relative to baseline forecasts for 2015.

Note: Dollar calculations are in 2005 dollars.

Source: Author's analysis of Bergsten and Gagnon (2012), the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

A falling U.S. trade deficit

The main macroeconomic results of this research are summarized in **Table 1**. Two scenarios are evaluated. In the low-impact case, eliminating currency manipulation in 2013 reduces the U.S. goods trade deficit by $200 billion relative to what it was in 2012. In the high-impact case, the U.S. trade deficit is reduced by $500 billion. These results are all expressed in constant 2005 dollars for consistency with the underlying models used in this study (see the previous section and Appendix A for further detail). These are the exogenous changes that drive all of the other results in the model.

The $200 billion to $500 billion trade-deficit reductions discussed above come from Bergsten and Gagnon (2012). Bergsten and Gagnon asked the staff of the Federal Reserve Board to use the Fed's macroeconomic model to simulate the effects of a 10 percent depreciation of the real trade-weighted dollar beginning in the first quarter of 2013. In the Bergsten and Gagnon base case, a 10 percent depreciation resulted in a $200 billion improvement in the current account in the Fed model. They scaled up and assumed that a $500 billion improvement in the current account would require a real trade-weighted depreciation of up to 25 percent. Bergsten and Gagnon (2012, 5) therefore assumed that "the permanent elimination of excessive currency intervention would be associated with a long-lasting depreciation of the dollar of between 10 and 25 percent in real terms."

It is important to set the trade-deficit reduction assumptions used here in some context. In 2012 the United States had a goods trade deficit of $741.5 billion (4.6 percent of GDP) and a current account deficit of $440.6 billion (2.7 percent of GDP) (U.S. Department of Commerce 2013a and 2013c).[14] The last time the United States engaged in a major international intervention to realign the U.S. dollar was the Plaza Accord in 1985 (Funabashi 1989). At that time, agreement was reached with Japan, Germany, and other major trading nations to reduce the value of the dollar by approximately 30 percent. The U.S. economy was growing very rapidly (with real average growth from 1985 through 1989 of 3.8 percent).[15] As a result, the goods trade deficit continued to grow for several years after the Plaza Accord took effect, despite devaluation, rising from 2.8 percent of GDP in 1985 to 3.3 percent in 1987 (Appendix Table A1). However, export growth accelerated rapidly (reaching a peak of 28.0 percent in 1988) and import growth, though still positive, contracted after peaking in 1987. Although not shown in the table, the trade deficit as a share of GDP fell by 2 percentage points between 1987 and 1991 (a recession year).

With a U.S. trade deficit, as of 2012, of over $740 billion (4.6 percent of GDP), and a current account of $440 billion—which the International Monetary Fund (IMF 2013b) projects will rise to $525 billion in 2015 and $639 billion in 2018—it would appear that a $200 billion reduction in the U.S. trade deficit is a far too modest goal for a major currency realignment. Based on past experience under the Plaza Accord, it is much more likely that a major currency realignment will reduce U.S. trade deficits by $400 to $500 billion, more in keeping with the high-impact scenario used here.

Macroeconomic impacts of a falling trade deficit

This report assumes that the economy will continue to be plagued by anemic growth over the next two to three years. The Congressional Budget Office and other macroeconomic forecasters frequently assume that the economy will "naturally and quickly" recover over the next four years or so (Bivens, Fieldhouse, and Shierholz 2013, Figure J at 19). However, the CBO forecasts have consistently issued premature dates for when recovery will occur, dating back to at least 2009, Bivens, Fieldhouse, and Shierholz note. In the absence of substantial and sustained demand-side stimulus, the economy is likely to remain well below potential output for the next seven years (Bivens, Fieldhouse, and Shierholz 2013, Figure K at 21).

With the economy operating well below potential in the forecast period (2013–2015), reductions in the trade deficit would have a strong multiplier effect on GDP; specifically, a multiplier of 1.44, equivalent to that for infrastructure spending (Zandi 2011). (Wages in manufacturing are high, so reductions in the trade deficit would have larger effects on output than, for example, tax cuts, part of which are saved.)

Thus, a $200 billion reduction in the trade deficit would increase GDP by $288 billion in 2015 relative to forecasted GDP in 2015, and a $500 billion trade-deficit reduction would increase GDP by $720 billion, as shown on line 2 of Table 1. The projected increases in GDP are between 2.0 percent and 4.9 percent of projected GDP in 2015, relative to baseline economic forecasts from the Congressional Budget Office (2013a).

The overall number of jobs supported by the increase in output (GDP) are estimated from a simple rule of thumb developed by Bivens (2011), based on historical relationships between output and employment. In 2011, each 1 percent increase in GDP was associated with a 0.9 percent increase in employment (approximately 1.2 million workers). Thus, this research assumes that the employment-to-output relationship will remain roughly constant between 2013 and 2015 at its 2011 level.

To estimate the overall number of jobs created by the fall in the trade deficit, we do not compare the incremental number of jobs created with the CBO employment forecast for 2015 because recent trends suggest that the CBO forecast is too optimistic. Although unemployment fell from an average of 8.9 percent in 2011 to 7.0 percent in November 2013 (Bureau of Labor Statistics 2013c), broader measures of unemployment that account for discouraged workers and involuntary part-time workers seeking full-time employment show that the labor market in 2013 remained very weak. CBO forecasts ignore the U6 unemployment rate, a measure of un- and underemployment, which was 13.2 percent in November 2013 (Bureau of Labor Statistics 2013a).

Overall, trends in employment-to-population measures indicate that "four years into the recovery … we have climbed only about one-fifth out of the [labor market] hole left by the Great Recession" (Shierholz 2013). One reason for this is that job growth since the start of the Great Recession (in December 2007) has not kept pace with underlying growth in the labor force, which has itself been suppressed by the lack of job opportunities. The U.S. labor force increased by about 1.6 million workers per year between 2004 and 2008, and only 1.1 million workers in total between 2008 and 2013, in the wake of the recession (BLS 2014). However, total employment at the end of 2013 remained 1.4 million jobs *below* the level of actual employment at year-end in 2007. Projected rates of underlying growth in the economy are unlikely to eliminate excess unemployment, much less sustain *any* growth in the labor force by 2015. For this reason, we assume that employment at year-end 2013 is a reasonable proxy for the health of the labor market in 2015.

Using the relevant multiplier, we find that a 2.0 to 4.9 percentage-point increase in U.S. output (GDP) would create 2.3 million to 5.8 million jobs (Table 1). And when we compare the incremental increase in jobs with the jobs gap in December 2013, we find that this increase in jobs reduces the U.S. jobs deficit by between 28.8 percent and 72.5 percent (not shown).[16]

Increases in domestic employment will increase tax revenues (through the rise in national income and wages) and decrease safety-net expenditures (through reduced spending for unemployment insurance, food stamps, Medicaid, and other forms of public assistance). Analysis of the effects of falling unemployment on net federal budget deficits indicates that federal deficits are reduced by $0.37 for each dollar of increased GDP (Bivens and Edwards 2010). As a result, the projected increases in GDP would decrease federal deficits in 2015 relative to projections (Congressional Budget Office 2013b) by between $107 billion and $266 billion (Table 1), and the reductions would continue as long as trade deficits are suppressed. These benefits are generated at no cost to the federal government. Federal budget deficits in 2015 would

TABLE 2

Number of U.S. jobs created by ending currency manipulation, 2015*

	Scenario**	
	Low impact	**High impact**
Direct jobs	1,112,700	2,280,800
Indirect jobs	487,300	1,719,200
Respending jobs	700,000	1,800,000
Total	2,300,000	5,800,000

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

Source: Author's analysis of the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

be 34.4 percent to 86.1 percent lower, relative to baseline budget projections from the Congressional Budget Office (2013b).

State and local revenues and spending would also improve relative to projections, as increases in national and state GDP flow from reductions in U.S. trade deficits. Recent empirical research has estimated that, on average, state budgets (spending minus revenues) will improve by $0.14 for each dollar of improvement in GDP (Kondo and Svec 2009, 10). Increases in GDP associated with falling U.S. trade deficits would thus improve state and local finances by between $40 billion and $101 billion, which would reduce estimated state and local deficits by between 27.4 percent and 68.4 percent in 2015 (Table 1).

Job growth as trade deficits fall

Projections of the growth of imports and exports and reductions in U.S. trade deficits allow us to estimate jobs gained and lost overall and at the sector level.

Direct, indirect, and respending jobs (aggregated over all industries) are reported in **Table 2**. Reducing trade deficits by eliminating currency manipulation would support an additional 1,112,700 to 2,280,800 direct jobs, relative to underlying trends. An additional 487,300 to 1,719,200 indirect jobs in supplier industries would also be supported, including jobs in manufacturing, commodity, and service industries, as shown below. Finally, wages generated in these jobs would support an additional 700,000 to 1,800,000 respending jobs. Combining direct, indirect, and respending jobs yields a total of 2.3 million to 5.8 million jobs created by ending currency manipulation.

Job gains and losses by industry

Projected increases in imports and exports over the 2013–2015 period were used to estimate the distribution of jobs (direct, indirect, and respending) by industry for the 45 unique industries (plus eight aggregate sectors) in the U.S. Census Bureau sector plan (U.S. Census Bureau 2009). Our analysis compares jobs with 2011 employment data as a baseline to estimate jobs gained or lost as a share of industry employment. Since both imports and exports were allowed to rise in the forecast, trade deficits increased in some sectors and fell in others. As a result, there were job gains in some industries and job losses in others, despite the overall, projected reduction in the U.S. trade deficit in the 2013–2015 period. The breakdown by industry is shown in **Table 3.**

Overall, reducing U.S. goods trade deficits would create between 891,500 and 2,337,300 jobs in manufacturing (38.8 percent to 40.3 percent of jobs gained across industries), representing the largest jobs gain of any major industry. Within manufacturing, the largest gains would occur in durable goods, specifically "machinery, except electrical," with 170,500 to 353,900 jobs gained (respectively, 7.4 percent and 6.1 percent of total jobs gained). Jobs gained in non-electrical machinery would increase total employment by 14.4 percent to 29.8 percent in that sector. Other manufacturing industries with large gains would include transportation equipment (164,100 to 352,400 jobs), computer and electronic parts (127,600 to 338,000 jobs), fabricated metal products (104,200 jobs to 251,800 jobs), and miscellaneous manufactured commodities (99,400 to 243,300 jobs).

Major job winners outside of manufacturing include agriculture, forestry, and fisheries (246,800 to 486,100 jobs); health care and social assistance (167,900 to 430,600 jobs); administrative and support industries (166,700 to 413,900 jobs); professional, scientific, and technical services (140,300 to 357,100 jobs); and accommodation and food services (142,500 to 358,600 jobs).

Growing imports did result in net job losses in some industries, including apparel and accessories (107,400 and 66,000 jobs). Although losses in apparel and accessories represent a small share of jobs gained (-4.7 percent and -1.1 percent of the total gains), these losses would represent 39.4 percent and 24.2 percent of 2011 employment in these industries, which have been decimated by trade over the past few decades. Other industries suffering losses include (crude) oil and gas (extraction), with losses of 24,900 and 11,400 jobs, and leather and apparel products, with losses of 22,200 and 10,800 jobs, representing 46.5 percent and 22.6 percent, respectively, of employment in this industry in 2011.

Job losses in these industries are the net result of projected changes in trade flows in sectors where the growth in imports exceeds that of exports. However, in the high-impact scenario, which assumes faster rates of growth for all types of exports, the *growth* in the trade deficit in each of these industries is therefore smaller. Hence, the number of jobs lost is smaller in the high-impact scenario than in the low-impact case (where import growth dominates), in these particular sectors.

Job gains by state and congressional district

Estimates of job gains and losses by industry form the foundation for the estimation of job gains by state and congressional district. Estimates of employment by state and congressional district for each of the 45 unique industries in the model were obtained from the U.S. Census Bureau (2013). These were used to estimate employment shares by state and congressional district for each industry. These shares were used to estimate total jobs gained per district, with 2011

TABLE 3

Net U.S. jobs created or displaced by eliminating currency manipulation, by industry, 2015*

	Scenario**					
	Low impact			High impact		
	Net jobs gained/ lost	Jobs gained/ lost as share of industry employment (2011 average)	Jobs gained/ lost as share of job gains across industries	Net jobs gained/ lost	Jobs gained/ lost as share of industry employment (2011 average)	Jobs gained/ lost as share of job gains across industries
Agriculture, forestry, and fisheries	246,800	12.6%	10.7%	486,100	24.9%	8.4%
Mining	7,400	1.0%	0.3%	53,000	6.9%	0.9%
Oil and gas	-24,900	-29.6%	-1.1%	-11,400	-13.5%	-0.2%
Minerals and ores	32,400	4.7%	1.4%	64,400	9.4%	1.1%
Utilities	18,600	1.5%	0.8%	45,000	3.7%	0.8%
Construction	13,400	0.2%	0.6%	54,400	0.6%	0.9%
Manufacturing	891,500	6.1%	38.8%	2,337,300	15.9%	40.3%
Nondurable goods	-65,300	-2.7%	-2.8%	85,900	3.6%	1.5%
Food and kindred products	54,100	3.4%	2.4%	119,700	7.6%	2.1%
Beverage and tobacco products	2,300	1.0%	0.1%	8,800	3.7%	0.2%
Textile mills and textile product mills	8,000	2.9%	0.3%	34,100	12.4%	0.6%
Apparel and accessories	-107,400	-39.4%	-4.7%	-66,000	-24.2%	-1.1%
Leather and allied products	-22,200	-46.5%	-1.0%	-10,800	-22.6%	-0.2%
Industrial supplies	206,900	5.6%	9.0%	477,300	12.9%	8.2%
Wood products	9,100	2.4%	0.4%	28,000	7.4%	0.5%
Paper	29,100	7.3%	1.3%	63,400	16.0%	1.1%
Printed matter and related products	17,000	2.9%	0.7%	36,700	6.3%	0.6%
Petroleum and coal products	7,700	3.6%	0.3%	16,200	7.5%	0.3%
Chemicals	87,800	7.0%	3.8%	189,000	15.1%	3.3%
Plastics and rubber products	42,700	9.1%	1.9%	106,100	22.7%	1.8%
Nonmetallic mineral products	13,500	3.3%	0.6%	38,100	9.3%	0.7%

TABLE 3 (CONTINUED)

	Scenario**					
	Low impact			High impact		
Durable goods	749,900	8.7%	32.6%	1,774,100	20.7%	30.6%
Primary metal	59,500	11.2%	2.6%	138,500	26.1%	2.4%
Fabricated metal products	104,200	9.0%	4.5%	251,800	21.8%	4.3%
Machinery, except electrical	170,500	14.4%	7.4%	353,900	29.8%	6.1%
Computer and electronic parts	127,600	10.1%	5.5%	338,000	26.7%	5.8%
Computer and peripheral equipment	12,300	5.5%	0.5%	48,800	21.9%	0.8%
Communications, audio, and video equipment	-2,500	-1.5%	-0.1%	25,700	15.1%	0.4%
Navigational, measuring, electromedical, and control instruments	52,500	25.1%	2.3%	107,100	51.2%	1.8%
Semiconductors and other electronic components and magnetic and optical media production	65,300	9.8%	2.8%	156,400	23.6%	2.7%
Electrical equipment, appliances, and component	33,900	8.2%	1.5%	90,800	21.9%	1.6%
Transportation equipment	164,100	8.2%	7.1%	352,400	17.6%	6.1%
Motor vehicles and parts	47,000	4.5%	2.0%	140,400	13.4%	2.4%
Aerospace product and parts	108,900	15.0%	4.7%	195,500	27.0%	3.4%
Railroad, ship, and other transportation equipment	8,200	3.7%	0.4%	16,500	7.4%	0.3%
Furniture and fixtures	-9,200	-2.2%	-0.4%	5,300	1.3%	0.1%
Miscellaneous manufactured commodities	99,400	6.2%	4.3%	243,300	15.1%	4.2%
Wholesale trade	0	0.0%	0.0%	0	0.0%	0.0%

TABLE 3 (CONTINUED)

	Scenario**					
	Low impact			High impact		
Retail trade	0	0.0%	0.0%	0	0.0%	0.0%
Transportation	113,000	2.0%	4.9%	275,200	4.8%	4.7%
Information	26,000	0.9%	1.1%	65,400	2.2%	1.1%
Finance and insurance	75,500	1.1%	3.3%	188,100	2.8%	3.2%
Real estate and rental and leasing	43,400	1.7%	1.9%	109,800	4.2%	1.9%
Professional, scientific, and technical services	140,300	1.5%	6.1%	357,100	3.9%	6.2%
*Management of companies and enterprises****	68,500	62.4%	3.0%	174,200	158.8%	3.0%
Administrative and support and waste mgmt. and remediation services	166,700	2.8%	7.2%	413,900	7.0%	7.1%
Education services	36,400	0.3%	1.6%	93,200	0.7%	1.6%
Health care and social assistance	167,900	0.9%	7.3%	430,600	2.2%	7.4%
Arts, entertainment, and recreation	31,600	1.1%	1.4%	80,600	2.7%	1.4%
Accomodation and food services	142,500	1.4%	6.2%	358,600	3.5%	6.2%
Other services	99,800	1.4%	4.3%	251,400	3.6%	4.3%
Government	10,300	0.1%	0.4%	26,000	0.4%	0.4%
Total	2,300,000	1.6%	100.0%	5,800,000	4.1%	100.0%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

***Shares are based on Current Population Survey definition of industries; the Bureau of Labor Statistics' establishment survey (BLS 2013b) reports that 1,891,000 workers were employed in "Management of companies and enterprises" (NAICS 55), on average, in the 2009–2011 period (see text for details). The reported gains in employment in this sector represented 3.6 percent to 9.2 percent of employment in NAICS 55 in this period.

Source: Author's analysis of the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

employment as the baseline for estimating jobs gained or lost as a share of total state or district employment (see Appendix A for further details). Thus, states and congressional districts that have proportionately high shares of employment in industries with high job growth due to falling trade deficits (such as non-electrical machinery, transport equipment,

or agriculture) were projected to be the largest gainers from reducing trade deficits. Likewise, states and districts that intensively employ workers in industries with growing trade deficits, such as apparel and accessories, and leather and allied products, suffered smaller job gains (or, for two districts only, under the low-impact scenario, outright job losses).

Job gains by state, ranked by shares of total state employment under the high-impact scenario, are reported in **Table 4.** Wisconsin is the top-ranked state by jobs as a share of total state employment, with 64,700 to 156,600 jobs gained (2.29 percent to 5.55 percent of the total state employment in 2011). Nine of the top 10 states gaining the most jobs (as a share of total employment) in both scenarios are in the Midwest, including six states where manufacturing predominates: Wisconsin (64,700 to 156,600 jobs), Indiana (61,000 to 152,600 jobs), Iowa (34,000 to 79,600 jobs), Minnesota (55,900 to 135,300 jobs), Michigan (82,800 to 207,200 jobs), and Ohio (103,200 to 254,600 jobs); and three states that also benefit from manufacturing and/or agricultural job growth: South Dakota (9,200 to 21,100 jobs); Kansas, a major producer of aircraft and parts (28,900 to 67,000 jobs); and Nebraska (19,000 to 44,200 jobs). In the West, Idaho, a significant employer in computer and electronic parts production (13,900 to 32,700 jobs), rounds out the top 10 states gaining the most jobs. The distribution of job gains in the 50 states and the District of Columbia is shown in **Figure C**.

States 11 through 20 are dominated by manufacturing states such as Oregon, New Hampshire, Arkansas, South Carolina, Washington, Illinois, Kentucky, Connecticut, and Pennsylvania. North Dakota, at number 12, is a large agricultural producer that has also become a major oil producer (refined petroleum and chemicals are two of the most rapidly growing U.S. manufacturing export industries).

States in the industrial Midwest were particularly hard hit by the Great Recession. Eliminating trade deficits will eliminate most or all of the remaining jobs gaps—the number of jobs needed to return to pre–Great Recession employment— in many of these states.[17] In the high-impact scenario, job growth would entirely eliminate the jobs gap in Wisconsin, Iowa, Minnesota, and Michigan. It would also eliminate 84 percent to 94 percent of the jobs gap in Indiana, Ohio, Kansas, and Nebraska.[18]

Job gains by state, ranked by the total number of jobs gained under the high-impact scenario, are shown in Appendix Table B1. Job gains by state, sorted alphabetically are shown in Appendix Table B2. Every state and the District of Columbia will gain jobs in both the low- and high-impact scenarios. Job gains in the low-impact scenario range from 1.06 percent of state employment in the District of Columbia to 2.29 percent of employment in Wisconsin. Job gains in the high-impact scenario range from 2.64 percent in the District of Columbia to 5.55 percent in Wisconsin.

This study is the first to estimate trade-related employment changes by congressional district for the current, 113th Congress. Data were obtained from the 2011 American Community Survey (U.S. Census Bureau 2013) using new congressional districts based on the 2010 Census and used in congressional elections in 2012.

Our analysis compares jobs with 2011 employment data as a baseline to estimate job gains as a share of district employment. The data show that reducing trade deficits by eliminating currency manipulation would create thousands of jobs in all congressional districts but two in the low-impact scenario and in all districts in the high-impact scenario. The 20 congressional districts with the largest shares of jobs created in the low-impact scenario are shown in **Table 5**. Each of the top 20 districts would gain at least 6,700 jobs, with the 21st Congressional District in California gaining as many as 10,100 jobs. Job gains as a share of district employment range from 2.39 percent to 4.14 percent. Of the states with

TABLE 4

Net U.S. jobs created by eliminating currency manipulation, by state, 2015 (ranked by jobs gained as a share of total state employment under high-impact scenario)*

			Scenario**			
			Low impact		High impact	
Rank	State	State employment (2011 average)	Net jobs created	Jobs created as a share of state employment	Net jobs created	Jobs created as a share of state employment
1	Wisconsin	2,819,475	64,700	2.29%	156,600	5.55%
2	Indiana	2,934,500	61,000	2.08%	152,600	5.20%
3	Iowa	1,538,755	34,000	2.21%	79,600	5.17%
4	South Dakota	415,625	9,200	2.21%	21,100	5.08%
5	Minnesota	2,728,880	55,900	2.05%	135,300	4.96%
6	Michigan	4,191,880	82,800	1.98%	207,200	4.94%
7	Ohio	5,213,455	103,200	1.98%	254,600	4.88%
8	Kansas	1,389,040	28,900	2.08%	67,000	4.82%
9	Idaho	684,915	13,900	2.03%	32,700	4.77%
10	Nebraska	943,645	19,000	2.01%	44,200	4.68%
11	Oregon	1,710,335	31,300	1.83%	78,600	4.60%
12	North Dakota	370,830	7,400	2.00%	17,000	4.58%
13	New Hampshire	684,805	12,700	1.85%	31,300	4.57%
14	Arkansas	1,235,755	22,500	1.82%	56,300	4.56%
15	South Carolina	1,968,925	35,600	1.81%	89,300	4.54%
16	Washington	3,118,000	61,300	1.97%	140,300	4.50%
17	Illinois	5,926,850	107,500	1.81%	266,400	4.49%
18	Kentucky	1,838,400	31,800	1.73%	82,500	4.49%
19	Connecticut	1,742,495	32,400	1.86%	77,000	4.42%
20	Pennsylvania	5,853,320	101,400	1.73%	253,000	4.32%
21	Alabama	1,981,095	33,000	1.67%	85,000	4.29%
22	Missouri	2,742,055	47,200	1.72%	116,800	4.26%
23	Tennessee	2,784,460	45,800	1.64%	118,100	4.24%
24	Oklahoma	1,681,760	27,900	1.66%	71,100	4.23%
25	California	16,426,695	258,400	1.57%	687,100	4.18%
26	Vermont	327,300	5,600	1.71%	13,600	4.16%
27	Utah	1,260,805	20,800	1.65%	51,600	4.09%
28	Mississippi	1,181,295	18,900	1.60%	47,900	4.05%
29	North Carolina	4,195,810	63,400	1.51%	170,000	4.05%
30	Rhode Island	511,235	8,300	1.62%	20,700	4.05%
31	Texas	11,455,070	179,100	1.56%	460,400	4.02%
32	Montana	479,990	8,200	1.71%	19,200	4.00%
33	Georgia	4,193,775	65,900	1.57%	167,600	4.00%
34	Arizona	2,687,990	43,500	1.62%	105,100	3.91%
35	Massachusetts	3,284,720	50,600	1.54%	128,400	3.91%

TABLE 4 (CONTINUED)

			Scenario**			
			Low impact		High impact	
36	Delaware	420,365	6,700	1.59%	16,200	3.85%
37	West Virginia	748,560	11,800	1.58%	28,800	3.85%
38	Colorado	2,492,420	38,300	1.54%	95,700	3.84%
39	Wyoming	289,975	4,200	1.45%	10,900	3.76%
40	Maine	643,105	9,300	1.45%	24,000	3.73%
41	New Jersey	4,152,515	57,200	1.38%	150,900	3.63%
42	New Mexico	869,775	12,500	1.44%	30,800	3.54%
43	Louisiana	1,973,940	27,800	1.41%	69,700	3.53%
44	Virginia	3,860,130	52,500	1.36%	131,300	3.40%
45	Florida	8,101,900	110,200	1.36%	274,000	3.38%
46	New York	8,959,015	109,900	1.23%	296,400	3.31%
47	Nevada	1,204,880	16,000	1.33%	39,800	3.30%
48	Maryland	2,894,565	35,800	1.24%	89,400	3.09%
49	Alaska	344,345	3,900	1.13%	10,300	2.99%
50	Hawaii	629,525	7,200	1.14%	18,200	2.89%
51	District of Columbia	310,605	3,300	1.06%	8,200	2.64%
Total***		140,399,600	2,300,000	1.64%	5,800,000	4.13%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

***Total may vary slightly due to rounding.

Source: Author's analysis of the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

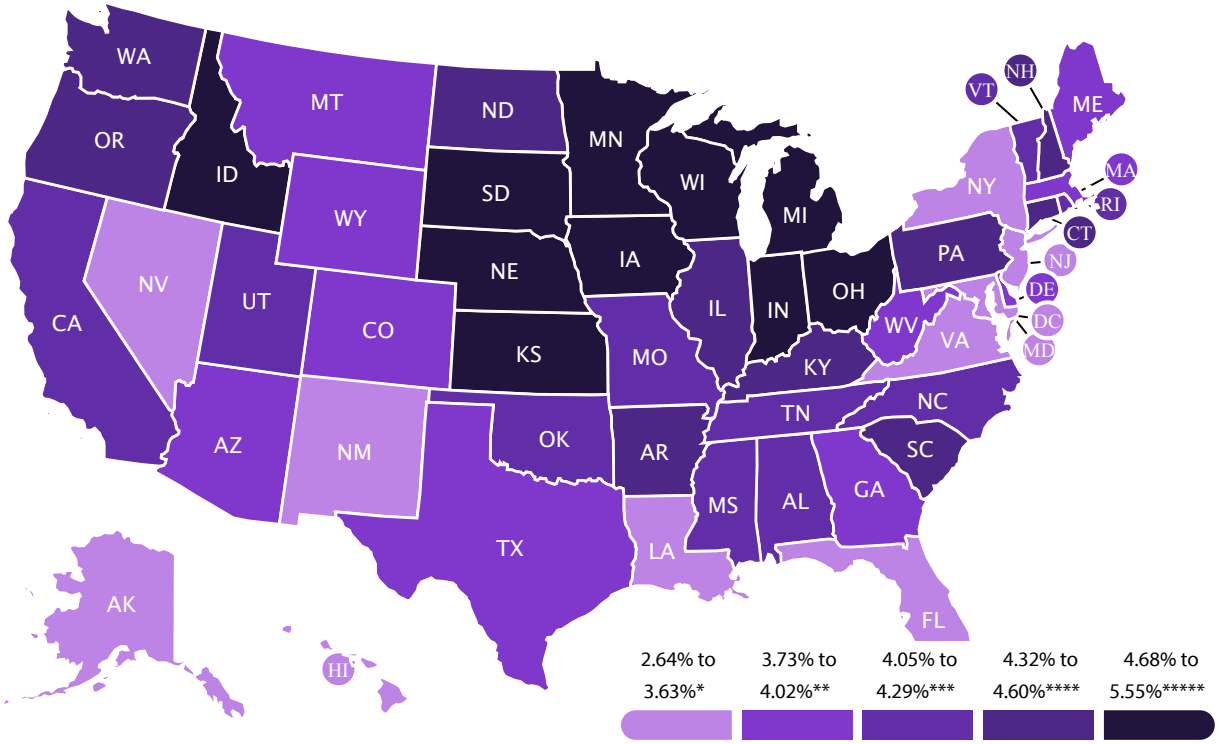
top-20 job-gaining districts are California and Wisconsin (four each); Ohio, Indiana, and Michigan (two each); and Kansas, Nebraska, Washington, Minnesota, Illinois, and Iowa (one each).

Complete lists of jobs gained by congressional district are included in supplemental tables posted online with this paper. As Supplemental Tables 1 and 2 show, only two districts would experience trade-related job losses in the low-impact scenario, including the 34th and 40th congressional districts, which are both in Los Angeles County, California. Both would be negatively impacted by projected increases in apparel imports.

The 20 congressional districts with the largest shares of jobs created in the high-impact scenario are shown in **Table 6**. Each of the top 20 districts would gain at least 14,700 jobs, with the 17th Congressional District in California gaining 24,400 jobs. Job gains as a share of district employment range from 5.79 percent to 8.65 percent. Of the states with top-20 job-gaining districts are California (with five); Wisconsin (three); Indiana, Ohio, and Michigan (two); and Kansas, Nebraska, Illinois, Minnesota, Washington, and Iowa (one each).

FIGURE C

Jobs created as a share of state employment from ending currency manipulation (shares under high-impact scenario), 2015



*10 least-impacted states, plus D.C.
**10 next-least impacted states
***10 middle-impacted states
****10 next-most impacted states
*****10 most-impacted states

Note: The map shows estimates of the effects of ending currency manipulation over three years, modeled as having begun in 2013. The high-impact scenario assumes ending currency manipulation would reduce the trade deficit by $500 billion in 2015 relative to the trade deficit in 2012. The number of jobs gained (or lost) is relative to 2011 employment.

Source: Author's analysis of U.S. International Trade Commission (2013), Bureau of Labor Statistics (2013d), and Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b). For a more detailed explanation of data sources and computations, see the Appendix.

Supplemental Tables 3 and 4 report jobs gained or lost by congressional district in the high-impact scenario. As the tables show, each congressional district in the United States gains jobs in the high-impact scenario, ranging from a low of 6,300 jobs in the 34th Congressional District of California to a high of 24,400 jobs gained in California's 17th Congressional District.

Conclusion

Currency manipulation has created large and growing trade deficits in the United States and other countries, and its elimination could create millions of good jobs here and in other hard-hit regions and countries, such as those in the

TABLE 5

20 congressional districts that would gain the most jobs from eliminating currency manipulation, low-impact scenario, 2015 (ranked by jobs gained as a share of district employment)*

Rank	State	District	Net jobs created	District employment (2011 average)	Jobs created as a share of district employment
1	California	21	10,100	243,800	4.14%
2	Kansas	4	9,800	332,900	2.94%
3	Wisconsin	6	9,900	353,600	2.80%
4	Nebraska	3	8,500	305,600	2.78%
5	California	16	6,700	244,900	2.74%
6	California	17	9,300	346,100	2.69%
7	Washington	4	7,600	284,500	2.67%
8	California	20	8,000	302,500	2.64%
9	Minnesota	7	8,400	328,700	2.56%
10	Ohio	4	8,000	317,900	2.52%
11	Wisconsin	5	9,300	370,600	2.51%
12	Illinois	17	7,800	311,700	2.50%
13	Indiana	2	7,900	317,800	2.49%
14	Wisconsin	8	9,000	362,800	2.48%
15	Michigan	6	7,700	310,400	2.48%
16	Iowa	1	9,700	392,300	2.47%
17	Indiana	3	8,000	327,000	2.45%
18	Ohio	8	8,000	328,800	2.43%
19	Michigan	10	7,400	308,700	2.40%
20	Wisconsin	1	8,200	342,500	2.39%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

Note: The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012.

Source: Author's analysis of the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

European Union. There are a number of steps that should be taken to address currency manipulation. In the short run, Congress should pass legislation authorizing the Commerce Department to treat currency manipulation as a countervailable subsidy in countervailing duty (CVD) trade complaints. This would provide immediate relief to importers that

TABLE 6

20 congressional districts that would gain the most jobs from the elimination of currency manipulation, high-impact scenario, 2015 (ranked by jobs gained as a share of district employment)*

Rank	State	District	Net jobs created	District employment (2011 average)	Jobs created as a share of district employment
1	California	21	21,100	243,800	8.65%
2	California	17	24,400	346,100	7.05%
3	Wisconsin	6	23,800	353,600	6.73%
4	Indiana	3	20,800	327,000	6.36%
5	Kansas	4	21,000	332,900	6.31%
6	Indiana	2	20,000	317,800	6.29%
7	Ohio	4	19,700	317,900	6.20%
8	Nebraska	3	18,800	305,600	6.15%
9	Wisconsin	5	22,500	370,600	6.07%
10	California	16	14,700	244,900	6.00%
11	California	19	19,300	324,000	5.96%
12	Michigan	6	18,400	310,400	5.93%
13	Illinois	17	18,300	311,700	5.87%
14	Michigan	10	18,100	308,700	5.86%
15	California	20	17,700	302,500	5.85%
16	Wisconsin	8	21,200	362,800	5.84%
17	Minnesota	7	19,100	328,700	5.81%
18	Ohio	8	19,100	328,800	5.81%
19	Washington	4	16,500	284,500	5.80%
20	Iowa	1	22,700	392,300	5.79%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

Note: The high-impact scenario assumes ending currency manipulation would reduce the trade deficit by $500 billion in 2015 relative to the trade deficit in 2012.

Source: Author's analysis of the American Community Survey (U.S. Census Bureau 2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

have been hurt by unfair competition from imports from currency manipulators. It would also send a strong signal to these countries that the United States is willing to confront currency manipulators.

The United States should also insist that currency manipulation be addressed in the proposed Trans-Pacific Partnership trade agreement. Members of the agreement should agree to not engage in currency manipulation. Penalties for engaging in currency manipulation should include a snap-back provision that would repeal all benefits of TPP membership for violators. Violators should also be subject to additional trade penalties, such as the currency-CVD measures discussed earlier.

Ultimately, the United States must develop measures to prevent or offset any efforts to manipulate currency through purchases of FX reserves by all countries with significant, sustained trade surpluses and excessive reserves of government-owned foreign assets. The administration must implement strategies that would tax and/or offset purchases of foreign assets by currency manipulating governments, which would make efforts to manipulate the dollar and other currencies costly and/or futile, as recommended by Gagnon and Hufbauer (2011) and Bergsten and Gagnon (2012). The United States should also announce its intent to take these measures and encourage other countries to adopt similar measures to block or offset currency manipulation.

Ending currency manipulation can reduce U.S. trade deficits by between $200 billion and $500 billion within three years, increasing GDP by between 2.0 percent and 4.9 percent (by between $288 billion and $720 billion), and creating 2.3 million to 5.8 million U.S. jobs. Expanding income would reduce U.S. budget deficits by between $107 billion and $266 billion in that period, and improve state and local finances by between $40 billion and $101 billion. Given that gridlock in Washington makes significant, new fiscal stimulus all but impossible, ending currency manipulation is the best available tool for stimulating demand for domestic output and ending the hangover of excess unemployment from the Great Recession.

Ending currency manipulation can also be good for workers and consumers in China and other currency manipulators, which would experience falling prices for food, fuel, and other imported commodities. These countries will need to stimulate domestic demand through measures such as increased infrastructure investment and increased safety-net spending, needed to offset the rebalancing of global trade.

It is time for the United States to take concrete steps to end currency manipulation. Decades of diplomatic arm twisting and passive acquiescence to wanton abuse of the rules of the International Monetary Fund and World Trade Organization have failed to reverse a growing tide of currency manipulation. Ending currency manipulation is the best available tool for rebalancing global demand, reflating the U.S. economy, and ending the jobless recovery.

About the author

Robert E. Scott is director of trade and manufacturing policy research at the Economic Policy Institute. He joined EPI as an international economist in 1996. Before that, he was an assistant professor with the College of Business and Management of the University of Maryland at College Park. His areas of research include international economics and trade agreements and their impacts on working people in the United States and other countries, the economic impacts of foreign investment, and the macroeconomic effects of trade and capital flows. He has a Ph.D. in economics from the University of California-Berkeley.

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Appendix A: Methodology

This analysis uses a simple macroeconomic model, based on Congressional Budget Office forecasts, to estimate the impact of ending currency manipulation on U.S. jobs and GDP. It then uses an input-output model based on Bureau of Labor Statistics (BLS) data to allocate jobs gains from ending currency manipulation to industries, states, and congressional districts. In most cases, the research uses data from 2012 as a baseline to project the state of affairs in 2015 had currency manipulation ended beginning in 2013, and compares this 2015 projection with baseline forecasts for 2015 from the Congressional Budget Office. This appendix identifies the specific data sources and comparisons used.

The macroeconomic model

The macroeconomic model used to estimate the overall impacts of reducing trade deficits on U.S. GDP and employment starts with a trade forecast from Bergsten and Gagnon (2012a), which found that currency manipulation caused a $200 billion to $500 billion increase in the U.S. trade deficit. The model assumes that eliminating currency manipulation beginning in 2013 would reduce trade deficits in 2015 by between $200 billion at the low end to $500 billion at the high end, relative to trade deficits in 2012. Our model estimates the incremental effect on GDP (and other macroeconomic variables) in 2015 of the given reductions in the trade deficit. These results are compared with baseline forecasts from the Congressional Budget Office (2013a and 2013b) for GDP and the federal budget deficit in 2015.

In our macroeconomic model, reductions in the trade deficit would have a multiplier impact on GDP of 1.44, with each dollar in trade-deficit reduction increasing GDP by $1.44. This is equivalent to the multiplier for infrastructure spending (Zandi 2011). Thus, a $200 billion reduction in the trade deficit would increase GDP by an estimated $288 billion in 2015, and a $500 billion reduction in the trade deficit would increase GDP by $720 billion. GDP in 2015 would be 2.0 percent to 4.9 percent larger than 2015 GDP projected by baseline economic forecasts from the Congressional Budget Office (2013a).

Estimates of the impact of incremental growth in GDP on the federal budget deficit were developed using GDP multipliers from Bivens and Edwards (2010). These were compared with CBO baseline estimates of the federal budget deficit in 2015. The incremental effect of trade deficit reduction on state and local budgets is estimated using regression estimates (of GDP multipliers) from Kondo and Svec (2009). Baseline estimates of state budget deficits are estimated from historical relationships between GDP and state spending, and from estimates of baseline GDP in 2015 from the U.S. Department of Commerce (2013b) and Congressional Budget Office (2013a).

The overall number of jobs supported by a given increase in output (GDP) is estimated from a simple rule of thumb developed by Bivens (2011), based on historical relationships between output and employment. In 2011, each 1 percent increase in GDP was associated with a 0.9 percent increase in employment (approximately 1.2 million workers). This research assumes that the employment-to-output relationship between 2013 and 2015 will remain roughly constant at

the 2011 level. This report estimates that a 2.0 percent to 4.9 percent increase in GDP would create an additional 2.3 million to 5.8 million jobs relative to trend growth.

Trade projections

Projections of the growth of imports and exports and reductions in U.S. trade deficits, based on recent trends in trade growth, were used to estimate jobs gained and lost by industry. The study assumes that eliminating currency manipulation would reduce trade deficits by between $200 billion under the low-impact scenario and $500 billion under the high-impact scenario by 2015. The level of real imports and exports for each of 195 BLS industries in 2011 and 2012 were estimated using deflators from the Bureau of Labor Statistics as explained below. Forecasts of imports and exports that matched projected changes in the trade balance were developed using data on actual trade flows in 2011–2012 and assumed changes in rates of growth for each BLS sector. Projections assumed that ending currency manipulation would result in a significant (10 percent to 25 percent) depreciation in the real, trade-weighted value of the U.S. dollar.

Trade projections assumed that the rate of import growth responds with a lag (the J-curve effect), increasing in 2013 and then declining in 2014 and 2015. It is assumed that export growth accelerates (at a declining rate) in each year of the forecast. Rates of growth vary from sector to sector, based on differences in baseline (2011–2012) growth rates. Overall average rates of growth of imports and exports are summarized in **Appendix Table A1**. Appendix Table A1 also includes data on rates of growth in exports and imports following the Plaza Accord in 1985, the last time there was a major, coordinated effort to reduce the dollar (which fell approximately 30 percent between 1985 and 1987).

APPENDIX TABLE A1

Trade and GDP growth, Plaza Accord (1985–1987) vs. eliminating currency manipulation (2012–2015)

	Plaza Accord					Trade scenario*						
						Low impact			High impact			
						+$200 billion			+$500 billion			
	Year	Imports	Exports	GDP growth	Trade deficit as a share of GDP	Year	Imports	Exports	Trade deficit as a share of GDP**	Imports	Exports	Trade deficit as a share of GDP**	GDP growth**
Base year	1985	1.7%	-1.8%	4.2%	2.8%	2012	4.8%	3.3%	5.9%	4.8%	3.3%	5.9%	2.3%
Year 1	1986	9.0%	3.4%	3.5%	3.2%	2013	5.3%	8.3%	5.8%	5.3%	10.4%	5.6%	1.4%
Year 2	1987	11.2%	12.0%	3.5%	3.3%	2014	4.7%	12.3%	5.2%	3.8%	17.8%	4.3%	2.6%
Year 3	1988	9.1%	28.0%	4.2%	2.4%	2015	4.3%	14.9%	4.1%	2.6%	21.6%	2.0%	4.1%
Year 4	1989	6.8%	12.4%	3.7%	2.1%								
Average		7.6%	10.8%	3.8%	2.7%		4.8%	9.7%	5.2%	4.1%	13.3%	4.5%	2.6%

Addenda

Changes in trade flows ($ billions)				Changes in trade flows ($ billions)				
1985–1988	109.1	104.3		2012–2015	314.6	514.6	253.8	753.8

*The scenarios estimate the effects of ending currency manipulation over three years, modeled as having begun in 2013. The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

**These columns show change in the measure relative to CBO forecast for GDP.

Source: Author's analysis of U.S. Census Bureau, Foreign Trade Division (2013), U.S. Department of Commerce, Bureau of Economic Analysis (2013c), Congressional Budget Office (2013a)

In comparing trade performance in the Plaza Accord era with projections for 2012–2015, it is important to note that actual (real) GDP growth in the 1985–1988 period averaged 3.9 percent per year, while (optimistic) CBO forecasts assume that GDP will grow only 2.6 percent per year, on average, over the 2012–2015 period. High rates of GDP growth in the late 1980s explain, in part, the very high rates of growth of imports during that period.[19]

The input-output model

The trade and employment analyses in this report are based on a detailed, industry-based study of the relationships between changes in trade flows and employment for each of approximately 195 individual industries of the U.S. economy, specially grouped into 45 unique sectors[20] and using the North American Industry Classification System (NAICS) with data obtained from the U.S. Census Bureau (2013) and the U.S. International Trade Commission (USITC 2013).

The number of jobs supported by $1 million of exports or imports for each of 195 different U.S. industries is estimated using a labor requirements model derived from an input-output table developed by the Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a).[21] This model includes both the direct effects of changes in output (for example, the number of jobs supported by $1 million in auto assembly) and the indirect effects on industries that supply goods used in the manufacture of cars. The indirect impacts include jobs in auto parts, steel, and rubber, as well as service industries such as accounting, finance, and computer programming. This model estimates the labor content of trade using empirical estimates from the U.S. Department of Commerce and the BLS-EP of labor content and trade flows in various years (2012 to 2015) between U.S. industries in a given base year (an input-output table for the year 2010 was used in this study, the most recent IO table that was available from the BLS-EP). It is not a statistical survey of actual jobs gained or lost in individual companies, or the opening or closing of particular production facilities (Bronfenbrenner and Luce 2004 is one of the few studies based on news reports of individual plant closings).

To develop the trade projections, nominal trade data for 2011–2012 were converted to constant 2005 dollars using industry-specific deflators (see next section for further details). This was necessary because the labor requirements table was estimated using price levels in that year. Data on real trade flows were converted to constant 2005 dollars using industry-specific price deflators from the BLS–EP (2011b). These price deflators were updated to 2012 using Bureau of Labor Statistics producer price indexes (industry and commodity data; Bureau of Labor Statistics 2013d). Use of constant 2005 dollars was required for consistency with the other BLS models used in this study.

Estimation and data sources

The findings in this paper come from a four-step data retrieval process followed by a four-step analysis.

Data requirements

Step 1. U.S. trade data were obtained from the U.S. International Trade Commission DataWeb (U.S. International Trade Commission 2013) in four-digit, three-digit, and two-digit NAICS format for total U.S. General Imports and Total Exports.

Step 2. To conform to the BLS Employment Requirements tables (BLS-EP 2011a), trade data must be converted into the BLS industry classifications system. For NAICS-based data, there are 195 BLS industries. The data are then mapped from NAICS industries onto their respective BLS sectors.

The trade data, which are in current dollars, are deflated into real 2005 dollars using published price deflators from the BLS-EP (2011b) and the Bureau of Labor Statistics (2013d).

Step 3. A 1×195 vector of data for total personal consumer expenditures (PCE) in 2005 dollars for 2010 was extracted from historical input-output data assembled by the BLS-EP (2011c). These data were used to estimate total employment supported by PCE expenditures (using the job-equivalents analysis described below). The results were used to estimate the share of respending jobs supported in each of 195 BLS industries.

Step 4. Real domestic employment requirements tables are downloaded from the BLS (2011a). These matrices are input-output industry-by-industry tables that show the employment requirements for $1 million in outputs in 2005 dollars. So, for industry i the a_{ij} entry is the employment indirectly supported in industry i by final sales in industry j and where $i=j$, the employment directly supported.

Analysis

Step 1. Job equivalents. BLS trade data are compiled into matrices. Let $[T_{2013}]$ be the 195×2 matrix made up of a column of imports and a column of exports for 2013. $[T_{2015}]$ is defined as the 195×2 matrix of 2015 trade data. Define $[E_{2010}]$ as the 195×195 matrix consisting of the real 2010 domestic employment requirements tables. To estimate the jobs displaced by trade, perform the following matrix operations:

$$[J_{2013}]=[T_{2013}]\times[E_{2010}]$$

$$[J_{2015}]=[T_{2015}]\times[E_{2010}]$$

$[J_{2013}]$ is a 195×2 matrix of job displacement by imports and jobs supported by exports for each of 195 industries in 2013. Similarly, $[J_{2015}]$ is a 195×2 matrix of jobs displaced or supported by imports and exports (respectively) for each of 195 industries in 2015.

The employment estimates for retail trade, wholesale trade, and advertising were set to zero for this analysis. We assume that goods must be sold and advertised whether they are produced in the United States or imported for consumption.

To estimate jobs created/lost over certain time periods, we perform the following operations:

$$[J_{nx13–15}]=[J_{2015}]-[J_{2013}]$$

Similarly, for respending (multiplier) analysis, let $[PCE_{2010}]$ be the 195×1 matrix of total U.S. personal consumer expenditures by industry in 2010 (in real 2005 dollars). To estimate the distribution of jobs supported by respending, perform the following matrix operations:

$$[J_{PCE2010}]=[PCE_{2010}]\times[E_{2010}]$$

Direct and indirect jobs. In order to estimate the direct jobs, the diagonal vector was extracted from the employment requirements matrix $[E_{2010}]$. This vector was multiplied times the trade vector to estimate direct trade-related jobs (e.g., $[J_{NX\text{-}DIRECT13–15}]$). Indirect jobs just equal total jobs less direct (e.g. $[J_{INDIRECT13–15}] = [J_{nx13–15}] - [J_{NX\text{-}DIRECT13–15}]$).

Step 2. Combining macroeconomic and IO jobs analyses. The IO jobs estimates in vectors [$J_{nx13–15}$] and [$J_{PCE2010}$] are converted into share vectors, representing the share of total jobs supported in each of 195 industries by reductions in trade deficits and related respending in the domestic economy. The shares in each vector sum to 1. Share vectors are used to allocate jobs gained by industry. The sum of direct and indirect jobs gained (Table 2) in each scenario are multiplied by the trade jobs share vector derived from [$J_{nx13–15}$], and the respending (also Table 2) jobs are multiplied by respending jobs share vector derived from [$J_{PCE2010}$]. The results yield estimates of jobs gained or lost by industry in the total economy as a result of projected reductions in U.S. trade deficits.

Step 3. State-by-state analysis. For states, employment-by-industry data were obtained from the U.S. Census Bureau's American Community Survey (U.S. Census Bureau 2013) data for the 2011 period and were mapped into 45 unique census industries and eight aggregated total and subtotals for a total of 53 sectors.[22] We look at job gains from 2013 to 2015, so from this point, we use macroeconomic jobs estimates derived from the vectors [$J_{nx13–15}$] and [$J_{PCE2010}$]. In order to work with 45 sectors, we group the 195 BLS industries into a new matrix, defined as [$Jnew_{13–15}$], a 45×1 matrix of job gains and losses. Define [St_{2011}] as the 45×51 matrix of state shares (with the addition of the District of Columbia) of employment in each industry. Calculate:

$$[Stj_{nx13–15}]=[St_{2011}]_T\,[Jnew_{13–15}]$$

where [$Stj_{nx13–15}$] is the 45×51 matrix of job gains and losses supported by state by industry. To get state total job gains, we add up the subsectors in each state.

Step 4. Congressional district analysis. Employment by congressional district, by industry, by state is obtained from the ACS data for 2011, which for the first time use geographic codings which match the boundaries of the 113th Congress (elected in 2012). In order to calculate job gains in each congressional district, we use each column in [$Stj_{nx13–15}$], which represent individual state job-gain-by-industry estimates, and define them as [Stj_{01}], [Stj_{02}], [Stj_i]…[Stj_{52}], with i representing the state number and each matrix being 45×1.

Each state has Y congressional districts, so [Cd_i] is defined as the 45xY matrix of congressional district employment shares for each state. Congressional district shares are calculated thus:

$$[Cdj_{01}]=[Stj_{01}]_T\,[Cd_{01}]$$

$$[Cdj_i]=[Stj_i]_T\,[Cd_i]$$

$$[Cdj_{51}]=[Stj_{51}]_T\,Cd_{51}]$$

where [Cdj_i] is defined as the 45xY job gains and losses in state i by congressional district by industry.

To get total job displacement by congressional district, we add up the subsectors in each congressional district in each state.

Appendix B: State job gains tables

Job gains by state, ranked by the total number of jobs gained under the high-impact scenario, are shown in **Appendix Table B1**. Job gains by state, sorted alphabetically are shown in **Appendix Table B2**. Complete lists of jobs gained by congressional district are included in supplemental tables posted online with this paper.

APPENDIX TABLE B1

Net U.S. jobs created by eliminating currency manipulation, by state, 2015 (ranked by jobs gained under high-impact scenario)*

			Scenario**			
			Low impact		High impact	
Rank	State	State employment (2011 average)	Net jobs created	Jobs created as a share of state employment	Net jobs created	Jobs created as a share of state employment
1	California	16,426,695	258,400	1.57%	687,100	4.18%
2	Texas	11,455,070	179,100	1.56%	460,400	4.02%
3	New York	8,959,015	109,900	1.23%	296,400	3.31%
4	Florida	8,101,900	110,200	1.36%	274,000	3.38%
5	Illinois	5,926,850	107,500	1.81%	266,400	4.49%
6	Ohio	5,213,455	103,200	1.98%	254,600	4.88%
7	Pennsylvania	5,853,320	101,400	1.73%	253,000	4.32%
8	Michigan	4,191,880	82,800	1.98%	207,200	4.94%
9	North Carolina	4,195,810	63,400	1.51%	170,000	4.05%
10	Georgia	4,193,775	65,900	1.57%	167,600	4.00%
11	Wisconsin	2,819,475	64,700	2.29%	156,600	5.55%
12	Indiana	2,934,500	61,000	2.08%	152,600	5.20%
13	New Jersey	4,152,515	57,200	1.38%	150,900	3.63%
14	Washington	3,118,000	61,300	1.97%	140,300	4.50%
15	Minnesota	2,728,880	55,900	2.05%	135,300	4.96%
16	Virginia	3,860,130	52,500	1.36%	131,300	3.40%
17	Massachusetts	3,284,720	50,600	1.54%	128,400	3.91%
18	Tennessee	2,784,460	45,800	1.64%	118,100	4.24%
19	Missouri	2,742,055	47,200	1.72%	116,800	4.26%
20	Arizona	2,687,990	43,500	1.62%	105,100	3.91%
21	Colorado	2,492,420	38,300	1.54%	95,700	3.84%
22	Maryland	2,894,565	35,800	1.24%	89,400	3.09%
23	South Carolina	1,968,925	35,600	1.81%	89,300	4.54%
24	Alabama	1,981,095	33,000	1.67%	85,000	4.29%
25	Kentucky	1,838,400	31,800	1.73%	82,500	4.49%
26	Iowa	1,538,755	34,000	2.21%	79,600	5.17%
27	Oregon	1,710,335	31,300	1.83%	78,600	4.60%
28	Connecticut	1,742,495	32,400	1.86%	77,000	4.42%
29	Oklahoma	1,681,760	27,900	1.66%	71,100	4.23%
30	Louisiana	1,973,940	27,800	1.41%	69,700	3.53%
31	Kansas	1,389,040	28,900	2.08%	67,000	4.82%
32	Arkansas	1,235,755	22,500	1.82%	56,300	4.56%
33	Utah	1,260,805	20,800	1.65%	51,600	4.09%
34	Mississippi	1,181,295	18,900	1.60%	47,900	4.05%
35	Nebraska	943,645	19,000	2.01%	44,200	4.68%

APPENDIX TABLE B1 (CONTINUED)

			Scenario**			
			Low impact		High impact	
36	Nevada	1,204,880	16,000	1.33%	39,800	3.30%
37	Idaho	684,915	13,900	2.03%	32,700	4.77%
38	New Hampshire	684,805	12,700	1.85%	31,300	4.57%
39	New Mexico	869,775	12,500	1.44%	30,800	3.54%
40	West Virginia	748,560	11,800	1.58%	28,800	3.85%
41	Maine	643,105	9,300	1.45%	24,000	3.73%
42	South Dakota	415,625	9,200	2.21%	21,100	5.08%
43	Rhode Island	511,235	8,300	1.62%	20,700	4.05%
44	Montana	479,990	8,200	1.71%	19,200	4.00%
45	Hawaii	629,525	7,200	1.14%	18,200	2.89%
46	North Dakota	370,830	7,400	2.00%	17,000	4.58%
47	Delaware	420,365	6,700	1.59%	16,200	3.85%
48	Vermont	327,300	5,600	1.71%	13,600	4.16%
49	Wyoming	289,975	4,200	1.45%	10,900	3.76%
50	Alaska	344,345	3,900	1.13%	10,300	2.99%
51	District of Columbia	310,605	3,300	1.06%	8,200	2.64%
Total***		140,399,600	2,300,000	1.64%	5,800,000	4.13%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

***Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau American Community Survey (2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

APPENDIX TABLE B2

Net U.S. jobs created by eliminating currency manipulation, by state, 2015 (in alphabetical order)*

			Scenario**			
			Low impact		High impact	
Rank under high-impact scenario	State	State employment (2011 average)	Net jobs created	Jobs created as a share of state employment	Net jobs created	Jobs created as a share of state employment
21	Alabama	1,981,095	33,000	1.67%	85,000	4.29%
49	Alaska	344,345	3,900	1.13%	10,300	2.99%
34	Arizona	2,687,990	43,500	1.62%	105,100	3.91%
14	Arkansas	1,235,755	22,500	1.82%	56,300	4.56%
25	California	16,426,695	258,400	1.57%	687,100	4.18%
38	Colorado	2,492,420	38,300	1.54%	95,700	3.84%
19	Connecticut	1,742,495	32,400	1.86%	77,000	4.42%
36	Delaware	420,365	6,700	1.59%	16,200	3.85%
51	District of Columbia	310,605	3,300	1.06%	8,200	2.64%
45	Florida	8,101,900	110,200	1.36%	274,000	3.38%
33	Georgia	4,193,775	65,900	1.57%	167,600	4.00%
50	Hawaii	629,525	7,200	1.14%	18,200	2.89%
9	Idaho	684,915	13,900	2.03%	32,700	4.77%
17	Illinois	5,926,850	107,500	1.81%	266,400	4.49%
2	Indiana	2,934,500	61,000	2.08%	152,600	5.20%
3	Iowa	1,538,755	34,000	2.21%	79,600	5.17%
8	Kansas	1,389,040	28,900	2.08%	67,000	4.82%
18	Kentucky	1,838,400	31,800	1.73%	82,500	4.49%
43	Louisiana	1,973,940	27,800	1.41%	69,700	3.53%
40	Maine	643,105	9,300	1.45%	24,000	3.73%
48	Maryland	2,894,565	35,800	1.24%	89,400	3.09%
35	Massachusetts	3,284,720	50,600	1.54%	128,400	3.91%
6	Michigan	4,191,880	82,800	1.98%	207,200	4.94%
5	Minnesota	2,728,880	55,900	2.05%	135,300	4.96%
28	Mississippi	1,181,295	18,900	1.60%	47,900	4.05%
22	Missouri	2,742,055	47,200	1.72%	116,800	4.26%
32	Montana	479,990	8,200	1.71%	19,200	4.00%
10	Nebraska	943,645	19,000	2.01%	44,200	4.68%
47	Nevada	1,204,880	16,000	1.33%	39,800	3.30%
13	New Hampshire	684,805	12,700	1.85%	31,300	4.57%
41	New Jersey	4,152,515	57,200	1.38%	150,900	3.63%
42	New Mexico	869,775	12,500	1.44%	30,800	3.54%
46	New York	8,959,015	109,900	1.23%	296,400	3.31%
29	North Carolina	4,195,810	63,400	1.51%	170,000	4.05%
12	North Dakota	370,830	7,400	2.00%	17,000	4.58%

APPENDIX TABLE B2 (CONTINUED)

			Scenario**			
			Low impact		High impact	
7	Ohio	5,213,455	103,200	1.98%	254,600	4.88%
24	Oklahoma	1,681,760	27,900	1.66%	71,100	4.23%
11	Oregon	1,710,335	31,300	1.83%	78,600	4.60%
20	Pennsylvania	5,853,320	101,400	1.73%	253,000	4.32%
30	Rhode Island	511,235	8,300	1.62%	20,700	4.05%
15	South Carolina	1,968,925	35,600	1.81%	89,300	4.54%
4	South Dakota	415,625	9,200	2.21%	21,100	5.08%
23	Tennessee	2,784,460	45,800	1.64%	118,100	4.24%
31	Texas	11,455,070	179,100	1.56%	460,400	4.02%
27	Utah	1,260,805	20,800	1.65%	51,600	4.09%
26	Vermont	327,300	5,600	1.71%	13,600	4.16%
44	Virginia	3,860,130	52,500	1.36%	131,300	3.40%
16	Washington	3,118,000	61,300	1.97%	140,300	4.50%
37	West Virginia	748,560	11,800	1.58%	28,800	3.85%
1	Wisconsin	2,819,475	64,700	2.29%	156,600	5.55%
39	Wyoming	289,975	4,200	1.45%	10,900	3.76%
Total***		140,399,600	2,300,000	1.64%	5,800,000	4.13%

*The table estimates the effects of ending currency manipulation over three years, modeled as having begun in 2013.

**The low-impact scenario assumes ending currency manipulation would reduce the trade deficit by $200 billion in 2015 relative to the trade deficit in 2012; the high-impact scenario assumes a $500 billion reduction in the trade deficit.

***Totals may vary slightly due to rounding.

Source: Author's analysis of U.S. Census Bureau American Community Survey (2013), U.S. International Trade Commission (2013), Congressional Budget Office (2013a and 2013b), Bivens (2011), Bivens and Edwards (2010), Kondo and Svec (2009, 10), Bureau of Labor Statistics (2013d), Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a and 2011b), and Zandi (2011). For a more detailed explanation of data sources and computations, see text and the appendix.

Endnotes

1. Other causes of growing trade deficits include suppression of labor rights (which drives down wages), illegal subsidies, and nontariff barriers to U.S. exports by countries such as China (Scott 2012).

2. The renminbi (RMB) is the official currency of the People's Republic of China. The yuan (abbreviated as CNY) is the basic unit of the currency (like the British sterling and pound), but it is also the popular name for Chinese currency, and will be used hereinafter.

3. Generally, depreciation is defined as the weakening of a currency due to market forces. Devaluation occurs when a government undertakes policies specifically designed to weaken or lower the value of its currency (Nelson 2013, note 22 at 8).

4. In practice, the level and value of imports and exports over any given period are determined by a number of factors, including both domestic income and exchange rates (for imports), and income in the rest of the world and exchange rates (for exports). In addition, both imports and exports respond to changes in the exchange rate with a lag. In the short run, depreciation of the home country's currency will increase the cost of imports in home currency units, and lower the cost of exports when expressed in foreign currencies. Domestic consumers will be slow to respond to changes in import prices (over time they will either consume less or switch to domestic substitutes). Thus, in the short run, before consumers have time to respond, the *value* of imports will increase while the value of exports may remain unchanged. In the medium-to-long term (two to three years) the value of imports will fall and the value of exports will rise. Thus, in the short term a depreciation may cause the *trade balance* (the value of exports less imports) to decline (worsen), but it should gradually improve over time. This is known as the "J-curve effect," which describes the effect of depreciation on the trade balance, over time.

In addition, imports are highly correlated with domestic income and therefore, as economies grow, the level of imports tends to rise. While a depreciation will tend (over time) to reduce imports, holding everything else constant. In the real world, with trend income growth, depreciation will tend to *reduce* the rate of growth of imports, relative to what they would have been if exchange rates had not changed.

5. Central bank reserves also include Special Drawing Rights and Reserve Positions in the International Monetary Fund, but foreign exchange reserves constitute the vast bulk of total reserve holdings for China and other countries with large stocks of total reserves.

6. See also Bergsten and Gagnon (2012, Figure 1). Reserves as reported by Bergsten and Gagnon (2012) include foreign assets held by sovereign wealth funds in China, South Korea, Singapore, Azerbaijan, Kazakhstan, Kuwait, Norway, and the United Arab Emirates.

7. Estimate reported is China's goods trade balance, as reported in its balance of payments accounts (International Monetary Fund 2013a). China reported an overall current account balance of only $193 billion in 2012. China's goods trade surplus was offset, in large part, by a rapidly growing services trade *deficit*, which increased from $15.1 billion in 2009 to $85.8 billion in 2012 (International Monetary Fund 2013a).

8. Self-reported trade data in Figure A may change as the number of reporting countries increases, based on the UN Comtrade database (2013). Data for 2011, and especially for 2012, are based on reports from only 75 percent to 80 percent of the total number of countries likely to report when the reporting process is complete. See Scott (2013) for details on data collection issues with partner country trade reports.

9. Purchases of foreign assets by the Chinese government include acquisitions by the central bank, The People's Bank of China, and asset purchases by other government agencies, including China's sovereign wealth funds.

10. As a practical matter, the Federal Reserve and Treasury may have to increase borrowing to finance countervailing currency interventions, which could raise total federal debt outstanding. Such borrowing could be constrained by the debt ceiling. This problem can be avoided by allowing the Treasury to count purchased foreign assets as an offsetting increase in equity holdings with no net impact on net federal debt outstanding.

11. Our model is based on the BLS employment requirements tables (BLS-EP 2011a) which provide greatest detail for goods production. As noted in the Appendix, about half (92 of 195 sectors) in the BLS model cover the goods producing segments of the economy. In addition, goods are responsible for 78.0 percent of the total volume of trade. Thus, depreciation of the dollar will have a much larger effect, quantitatively, on goods production and trade than on services (which make up the remaining 22.0 percent of total trade).

12. The Economic Policy Institute and other researchers have examined the job impacts of trade in recent years by netting the job opportunities lost to imports against those gained through exports. This report uses standard input-output models and data to estimate the jobs displaced by trade. Many reports by economists in the public and private sectors have used an "all-but-identical" methodology to estimate jobs gained or displaced by trade, including Groshen, Hobijn, and McConnell (2005) of the Federal Reserve Bank of New York, and Bailey and Lawrence (2004) in the *Brookings Papers on Economic Activity.* The U.S. Department of Commerce recently published estimates of the jobs supported by U.S. exports (Johnson and Rasmussen 2013) using input-output and "employment requirements" tables from the Bureau of Labor Statistics Employment Projections program (BLS-EP 2011a), the same source used to develop job displacement estimates in this report.

14. The U.S. current account deficit has been suppressed since 2007 by the very low rates of interest paid on Treasuries and other government securities as a result of "quantitative easing" and other types of monetary stimulus in place since the beginning of the Great Recession at the end of that year. As of year-end 2012, the United States had a net international investment position of -$3.9 trillion, which included $6.1 trillion in U.S. Treasuries and other government securities owned abroad, many of which were earning little or no interest at that time. If interest rates rise to more normal levels of 2 to 4 percentage points per year, interest payments abroad could rise between $100 billion and $200 billion per year, or more, moving the trade deficit and current account closer together again.

15. U.S. Department of Commerce, Bureau of Economic Analysis (2013c) and author's analysis.

16. In December 2013 the jobs gap was 7.9 million (Economic Policy Institute 2013).

17. The jobs gap is the number of jobs needed to lower unemployment to its December 2007 level, taking into account population and labor force growth in each state (Economic Policy Institute 2013).

18. State jobs gap data are not shown, and are based on Economic Policy Institute, forthcoming (Hall 2014).

19. It is also important to note that the historical data for 1985 to 1989 in Table A1 are nominal, while the projected data for 2012–2015 are in real 2005 dollars. Import prices increased 3.2 percent per year between 1985 and 1989 (U.S. Department of Commerce 2013c), which contributed to the high rate of growth of nominal imports in this period.

20. There are 53 industries in the ACS dataset used for this study, including 45 unique, detailed sectors and eight aggregates presenting totals and subtotals for sums across two or more detailed industries (U.S. Census Bureau 2013).

21. The BLS model includes 195 NAICS industries. The trade data include only goods trade. Goods trade data are available for 85 commodity-based industries, plus software, waste and scrap, used or second-hand merchandise, and goods traded under special classification provisions (e.g., goods imported from and returned to Canada; small, unclassified shipments). Trade in scrap, used,

and second-hand goods has no impact on employment in the BLS model. Trade in special classification provision goods was assigned to miscellaneous manufacturing.

22. The Census Bureau uses its own table of definitions of industries. These are similar to NAICS-based industry definitions, but at a somewhat higher level of aggregation. For this study, we developed a crosswalk from NAICS to Census industries, and used population estimates from the ACS for each cell in this matrix.

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