

August 2014

日本

The Yen Sets,  
but Does the Sun Rise?  
*Abenomics and the Future of Japan*



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## Acknowledgments

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# Contents

Executive Summary.....	1
Introduction .....	7
The Bubble and the Lost Decades.....	9
Abenomics and the Three Arrows .....	17
Yen Depreciation and Impacts on Trade and Investment .....	21
The Sensitivity of Japan's Exports and Imports to the Value of the Yen.....	37
Abenomics and the Future .....	45
Conclusion .....	55
About the Author .....	56

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# Executive Summary

Japan's economic model was held up as unstoppable in the 1970s and early 1980s—one that other nations should emulate. This appeared to be based on sound statistical support. However, with the benefit of hindsight, we know that Japan was about to be battered by collapsing asset bubbles followed by “lost decades” bereft of growth. A series of prime ministers implemented policies attempting to address the economic malaise, but they achieved little success.

The year 2012 marked a sea change of sorts, a moment in which popular frustration with stagnation—and perhaps fear of being rendered economically and politically irrelevant in Asia by China's looming presence—trumped inertia. Enter Shinzo Abe, elected prime minister on a platform of in-your-face nationalism and aggressive policies designed to restore growth and break the grip of deflation, a program soon to be termed “Abenomics.”

## Abenomics Explained

Abenomics is often described as the “three-arrow policy.” The first arrow is more aggressive monetary policy and inflation targeting. Arrow 2 is further large-scale fiscal stimulus, and the third arrow is structural reforms along many dimensions. Cooperation from politicians and government ministries, the Bank of Japan, and corporations will be essential in determining whether these policies succeed. Previously, a lack of collaboration doomed attempts to resurrect the economy.

Abe appointed Haruhiko Kuroda, then-head of the Asian Development Bank, to lead the Bank of Japan (BOJ) with the goal of implementing aggressive monetary expansion. Kuroda had long been a critic of the central bank's halfhearted attempts to stimulate the economy.

The BOJ's new Abe-friendly policy board adopted an inflation target (2 percent), a first for Japan. It also committed to doubling the monetary base over two years. This is an ambitious step—though notably less transformational than the Federal Reserve and Bank of England's measures during the global financial crisis. Most importantly, the BOJ widened the range of government bonds it is purchasing to include all maturities, aiming to lengthen the average duration of its assets from three years to seven. Further, it is purchasing private assets—mainly real estate investment trust securities and exchange-traded funds—to stimulate economic activity more directly.

The monetary bazooka has already had an impact. Consumer prices have stopped falling and may be starting to rise on a sustainable basis. It is premature to see this as an effect of the distortions imposed by the sales tax hike in April. And the exchange value of the yen against the dollar has fallen 24 percent since Abe was elected in November 2012, making Japan's exports (and domestic goods that compete with imports) more attractive.

Fiscal stimulus, the second arrow, includes an infrastructure package equal to about 4 percent of annual GDP, spread out over two years. It includes the construction of earthquake-resistant bridges, roads, and tunnels to repair the damage wrought by the 2011 catastrophe. That's real money, but little more, most likely, than would have been spent had Abe lost his election.

The second tranche of the fiscal package actually amounts to a net negative, since spending will be more than offset by an increase in consumption taxes over a two-year period. This is a reflection of the pressure to reduce the budget deficit and slow the growth of government debt, now the largest as a share of GDP among advanced industrial countries. And, of course, it reduces Abenomics' prospects to propel Japan beyond stagnation. But some commentators note that the back-loaded nature of the tax hike will give the government the opportunity to change tactics if the economy goes south.

The "third arrow" structural reforms announced thus far are limited in scope but provide flexibility for additional actions in the future. The Abe administration has reformed some business regulations that should aid hiring, made modest changes in allocating visas for skilled workers, and loosened some restrictions on firing. It has expanded child-care programs and increased labor mobility to improve female workforce participation. The female participation rate is 63 percent, much lower than the male rate of 94 percent.

Japan has joined discussions on the Trans-Pacific Partnership, a proposed free-trade agreement among the United States, Mexico, Canada, Chile, Peru, Australia, New Zealand, Brunei, Malaysia, Singapore and Vietnam. The Diet agreed to allow nonprescription drugs to be purchased over the Internet and patients to pay extra for treatment without forfeiting public health insurance support. Additionally, the Abe administration is contemplating directing the Government Pension Investment Fund (GPIF), the world's biggest public-sector investor, to increase the allocation of assets in equities and reduce the proportion in low-yielding government bonds.

## Yen Depreciation and Impacts on Trade and Investment

Depreciation of the yen could boost Japan's growth through the relative price impact on foreign trade or by giving Japanese consumers and businesses incentives to buy domestic goods. But calculating the timing or overall impact of these channels is not a straightforward process.

Japanese firms selling into foreign markets may decide not to pass through the full amount of their cost advantage. By the same token, foreign firms may choose to hang on to market share by cutting prices and accepting narrower profit margins, at least temporarily.

Note, too, that the timing of changes in trade flows in response to fluctuating exchange rates depends on past investment in domestic and foreign capacity. For example, Japanese firms responded to past appreciation of the yen by building factories in China and other emerging Asian economies to serve markets in third countries. Indeed, Japan's foreign direct investment (FDI) in China rose from \$12.4 billion in 2002 to \$93 billion in 2012. As a result, Japan's exports may not respond with alacrity when the yen depreciates because Japan may now lack the domestic capacity to take advantage of currency depreciation.

However, don't underestimate Japan's enduring importance in regional trade. Although its weight in global trade flows has waned in recent years, it continues to be a hub for intraregional trade in Asia. Japanese exports still represented nearly 60 percent of intraregional Asian exports in 2010, predominantly machinery, chemicals and transport equipment. Japan's exports are shifting to high-value-added, sophisticated intermediate inputs, and it accounts for a large share of global exports of auto parts and components as well as sophisticated

semiconductors, not just to Asia but the U.S. and Western Europe. Intermediate goods' share of total Japanese exports rose from 47 percent in 1990 to 60 percent in 2011.

Vertical specialization has risen throughout Asia, with Japan at the center. Japan provides a high degree of foreign value added (FVA) in the gross exports of other Asian nations. A significant proportion of FVA for Hong Kong and China's electronics equipment originates in Japan, as well as in motor vehicles for Thailand and Taiwan. The flow of FDI throughout Asia—much of it from Japan, and increasingly from China—have propelled growth in the region. However, the speed of further integration may be limited due to geopolitical and financial friction between the two giants.

It has been 19 months since the yen began to depreciate. And, on the surface anyway, Japanese trade data don't support the view that it is stimulating the economy. Indeed, export growth has been anemic (1.6 percent in 2013 and 3.4 percent in the first quarter of 2014), while import growth has been strong.

But caution in drawing conclusions is warranted because many factors other than currency value have affected trade flows. For example, Japan's energy imports have surged after the country's nuclear generators were shut down. Moreover, the rise in other imports may be tied to anticipation of the sales tax increase that took effect April 1 of this year.

One often overlooked explanation for the weakness in Japanese exports of manufactured products has been higher prices and curtailed supplies of electricity, which can be attributed to the Fukushima disaster. Rolling blackouts were initiated, along with, effectively, a rationing system. In this environment, Japanese firms were reluctant to bring production home, and foreign multinationals didn't invest in productive capacity in Japan.

Other factors can be added to the mix. It's hard to increase exports very much while global trade growth is sluggish. Another hurdle: the protracted effect of the Chinese boycott of Japanese goods in the wake of Abe's provocative visit to the Yasukuni shrine to pay respect to Japan's war dead. The share of Japanese vehicles in the Chinese market fell from 20 percent in October 2012 to just 8 percent a year later.

But, as our own statistical research demonstrates, there is a long lag between changes in the value of the yen and their ultimate impact on trade flows, investment, and economic performance. In other words, we shouldn't have expected a rapid response to depreciation. Our analysis shows that a sustained 10 percent depreciation of the yen results in a 3.6 percent increase in Japan's exports after three years. However, there is evidence to suggest that Japanese exports' sensitivity to yen depreciation is declining. The good news is that the most recent data suggest Japan's exports are, in fact, accelerating.

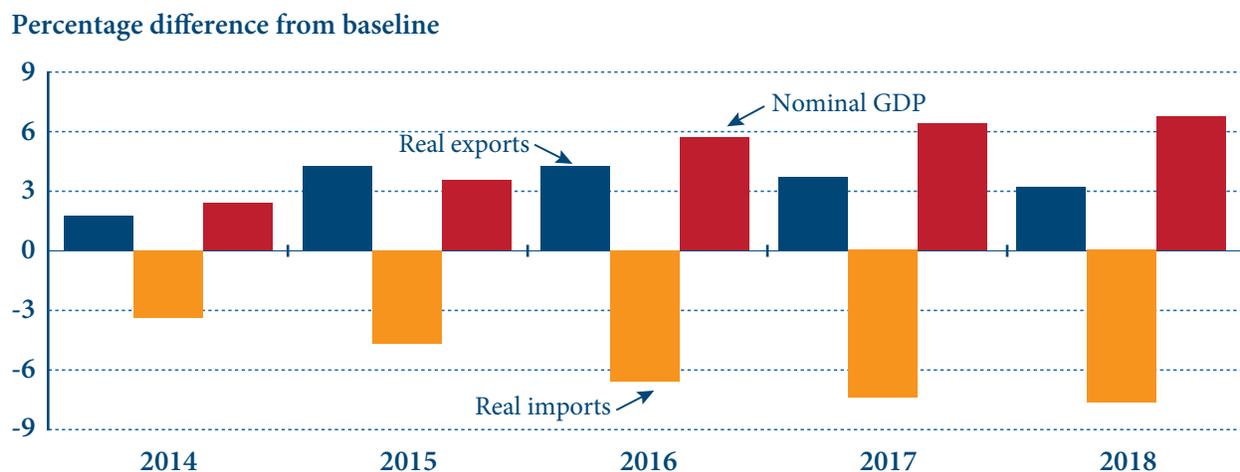
## Abenomics and Japan's Future

Current expectations for Japan's economic growth display a moderate but meaningful near- to medium-term improvement over pre-Abenomics forecasts. Regarding real GDP growth, the late-2012 consensus view for 2013 and 2014 was in the 0.7 percent range. The current consensus forecasts call for growth around 1.1 percent over the medium term—2014 through 2018. This is consistent with our assessment.

Without further monetary stimulus, the benefits from yen depreciation will likely begin to ameliorate in 2015. The quantitative easing program should be enlarged to provide an unequivocal shock and awe effect. BOJ asset purchases should be increased by ¥20 trillion over the next 12 to 18 months. The expansion of already planned asset purchases by this incremental figure would raise the level of buying to around 10 percent of GDP, which could depress the currency another 20 percent.

We evaluate such a scenario by using a macroeconomic modeling system that incorporates global linkages with Japan’s major trade, FDI, and portfolio flow partners to capture the full dynamic properties and feedback effects among economies. (Please see the full report for more details.) A very positive outcome from additional asset purchases would be much stronger growth in nominal GDP. More aggressive monetary policy would appear to end deflation as a serious concern. By 2018, nominal GDP would be 7 percent higher than the baseline outlook (see Figure ES1). Business investment is pushed higher, but not by a significant amount due to a lack of structural reforms and an attendant rise in productivity.

**Figure ES1 | Japan’s economy during further 20 percent yen depreciation simulation**



Source: Milken Institute.

To fundamentally alter the long-term trajectory of the Japanese economy and increase potential GDP, bolder structural, supply-side reforms will be necessary. These “third arrow” reforms have been lacking in scale. It’s all the more disappointing because Abe’s Liberal Democratic Party controls both chambers of the Diet legislature. If he can’t beat back interest-group opposition in his own party between elections, the prospects for success in an election year seem modest at best. Additional details on the planned structural reforms were provided in June, but more is needed.

With the working-age population declining, Japan must find ways to expand labor force participation. That shouldn’t be so difficult: The rate for females is substantially below that of other wealthy OECD member nations. This is a grossly underutilized asset, given that the educational attainment of Japanese women is among the highest in the world. But disappointingly few are inclined to work after childbirth.

The LDP has come around to adopting a more liberal view on female involvement in the labor force since Abe was first elected prime minister in 2005. At that time, opposition was based on the fear that it would lead to the disintegration of the traditional family and push the fertility rate—already well below that needed to maintain a stable population—even lower. But reforms weren’t enacted, and the fertility rate proceeded to fall further anyway.

Among measures that could make a difference: increasing the hours women can work before being subject to a higher marginal tax rate; providing more state-supported day care; making it more acceptable to breastfeed babies in the workplace, and pressing companies to promote women up the chain of authority.

Another area ripe for reform is government-induced labor market rigidity. Many large firms are reluctant to hire because it is so costly to lay people off. Meanwhile, barriers to starting new businesses—imposed by public agencies—can be stifling. Reforms here could address Japan’s chronic inability to spur technological change through the formation of startup firms.

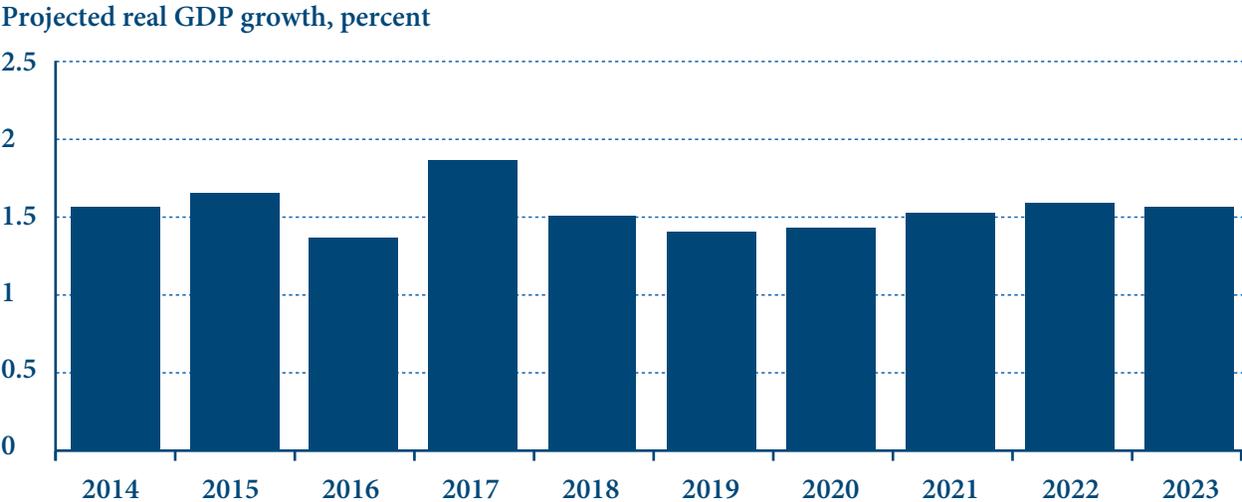
Abe has entered the Trans-Pacific Partnership negotiations with other Pacific Rim countries and seems committed to removing trade barriers. To succeed, however, he will have to break the hold of notoriously inefficient rice farmers, who cultivate tiny plots at very high cost.

Another area that could yield substantial benefits is cutting the corporate tax rate. Japan still has the second-highest among advanced economies, after the United States.

In a best-of-plausible-worlds scenario, we estimate that the overall workforce participation rate would rise by 6 percentage points. Nevertheless, even with this expansion, total employment would decline from 63.4 million in 2014 to 61 million in 2023 as the population ages. But that net loss could be more than offset by a business-friendlier environment that increased investment.

In that relatively rosy scenario, Japan’s real GDP would grow an average of 1.6 percent annually over the next decade—0.6 percent higher than in the baseline projection (see Figure ES2). By 2023, Japan’s real GDP is 5.3 percent higher than it would be in the absence of these more aggressive structural reforms. That’s not much, you say? I disagree. For a mature industrial economy in which both labor force and total population are dwindling, it would be an impressive performance.

**Figure ES2 | Japan’s growth rate with more aggressive structural reforms**



Source: Milken Institute.

# Main Takeaways

Japan has a historical knack for making a comeback when the odds seem longest. And it might be about to happen again. After two decades of lost growth, the stars may be lining up for a breakout.

The first two arrows of Abenomics have been launched, arguably providing the macroeconomic prerequisites for growth. But the lower yen won't spur export gains as it has in the past because Japanese multinationals have placed substantial FDI in China and other Asian countries. Much, however, depends on the third arrow, structural reforms. On that score, a depressing list of Abe's predecessors have been unable to summon the political will to make change happen.

A revitalized economy is, of course, crucial to the well-being of a nation that must support an aging population. But Japan's success would also have positive ramifications for Southeast Asia, which is becoming highly dependent on the Chinese economy. In the process, the burden on the United States to serve as a geopolitical counterweight to China would diminish.

Wish Abe well, for the futures of Japan, much of Asia, and the U.S. are inextricably tied.



# Introduction

This study evaluates the likely impact of “Abenomics,” a set of economic policies introduced by the Shinzo Abe-led government of Japan. Some refer to Abenomics as the “three-arrow policy.” The first arrow is more aggressive monetary policy and inflation targeting. Arrow 2 is further large-scale fiscal stimulus, and the third arrow is structural reforms along many dimensions. It further investigates how changing global and intra-Asian trade patterns and foreign direct investment (FDI) flows might affect the degree of impact that recent yen depreciation has on Japanese trade.

It is necessary to reflect on the causes of Japan’s economic malaise to gauge whether Abenomics can succeed after a series of prime ministers implemented policies that generated limited progress, or none at all. In the first section, “The Bubble and the Lost Decades,” the factors that led to the formation of asset bubbles are reviewed. The discussion moves on to how the real estate and stock bubbles burst and how that constrained Japan’s huge banking sector. Given the interlocking relationships among banks and non-financial firms receiving loans, banks kept extending credit so borrowers could meet interest payments, paralyzing the financial system. The last subsection documents Japan’s subpar performance relative to several advanced economies.

The next section, “Abenomics and the Three Arrows,” describes policies in the new economic program. It discusses asset purchases by the Bank of Japan (BOJ) and the announced 2 percent inflation target. It reviews the size of the fiscal stimulus, concluding that once the sales tax increases are included, it amounts to a net tightening. Lastly, it describes the structural reforms intended to boost the labor force participation rate, allow more immigration, pare trade restrictions, and enhance productivity growth.

“Yen Depreciation and Impacts on Trade and Investment” follows. This section documents how monetary policy actions have reduced the value of the yen on a trade-weighted basis. It covers the mechanisms of how depreciation should influence Japanese trade and provides a thorough review of the nation’s changing trade, FDI, and portfolio investment trends. A series of tables, segmented by country and product, depicts how Japan’s trading relationships have been altered. It further covers the same information for services. The chapter explains how Japan became the hub of the intra-Asian supply chain. In the next section, a series of econometric equations tests the sensitivities of Japan’s exports and imports to changes in the value of the yen. The results suggest a lower sensitivity to depreciation than in the past, due, in part, to Japanese multinationals expanding capacity outside the country. The section lastly assesses how Japan’s trade flows have responded since the yen began to soften in late 2012.

In “Abenomics and the Future,” we use a large-scale macroeconomic modeling system incorporating global trade links to evaluate the likely effectiveness of Abenomics. It includes two simulations depicting the Japanese economy’s response to yen depreciation and additional monetary stimulus. Lastly, an alternative simulation of Japan’s future economic growth is developed based on more aggressive structural reforms that boost potential GDP.

The structural reforms contemplated in Abenomics offer the country an opportunity to reverse course, and our “Conclusion” speculates on whether a confluence of events might precipitate the reforms necessary to alter Japan’s economic future.

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# The Bubble and the Lost Decades

**A**nyone who came of age in the 1970s and early 1980s was taught that Japan was an economic miracle and a model for aspiring countries to emulate. The diagnosis was based upon strong empirical evidence. Japan had rebuilt its industrial capacity after the devastation of World War II. Soaring exports, the renowned keiretsu system of interlocking ownership structures, and the Ministry of Finance channeling capital into the most productive sectors resulted in rapid growth and an unemployment rate that was the envy of advanced economies. Japan ascended to a dominant position in the world.

Many scholars expected the 21st century to be the Japan Century.<sup>1</sup> How could one refute this prognosis based on Japan's average real GDP growth rate of 9.6 percent from 1960 to 1973? In comparison, the rate for Organization for Economic Co-operation and Development (OECD) countries was 4.9 percent. Growth slowed to 3.8 percent from 1973 through 1989, after the OPEC oil shock, but still eclipsed the OECD average of 2.7 percent.

In retrospect, it's difficult to imagine a less accurate assessment of a country's economic future. For Japan was about to see its bubble economy burst and embark on two "lost decades." It suffered a general economic collapse that was unrivaled since the 1930s. In the broader reaches of time, no nation has endured a peacetime economic decline of this magnitude since the Irish Potato Famine in the late 1840s and the associated mass emigration.<sup>2</sup> The popping of the bubble was followed by rapidly diminishing asset values and bad loans accumulating on the books of banks along with a freezing of Japan's financial system and a 20 percent decline in prices—deflation in its truest form.

To understand the proper prescription for what ails the Japanese economy today and identify the forces leading to Abenomics, it is important to reflect on the sources of the malaise. Many analysts didn't fully appreciate that much of Japan's stellar performance was attributable to playing technological catch-up. Already a wealthy nation prior to World War II, Japan rebuilt its industrial infrastructure through stockpiling savings via deferred consumption and adopting the latest technology from the West.

Replacing virtually all of its fixed plant and capital equipment in such a short period left Japan with a capital stock at the frontier of productive possibilities—which conveyed temporary advantage. Japan had great engineering capabilities but never excelled as an innovator in a number of newly emerging fields. This spurred growth only until catch-up was achieved. Japan had established itself as the world's second-largest economy in the early 1980s. By 1990, Japan's GDP per capita, on a purchasing power parity basis, surpassed Germany, France, and the United Kingdom and came within 20 percent of the United States.<sup>3</sup>

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1. Michael M. Hutchison and Frank Westerman, *Japan's Great Stagnation: Financial and Monetary Policy Lessons for Advanced Economies*, (Cambridge, Mass., and London, England, The MIT Press, CESifo Seminar Series, 2006).

2. Barry Eichengreen, "Japan, Rising?," Milken Institute Review, Fourth Quarter 2013.

3. Yung Chul Park and Hugh Patrick with Larry Meissner, *How Finance Is Shaping the Economies of China, Japan, and Korea*, (New York, Chichester, West Sussex, Columbia University Press, 2013), p.32.

Another underappreciated factor was the untenable path of Japanese demographics. As my colleague the noted demographer Bill Frey likes to say, “Demography is destiny.” He means that we can predict a great deal about the future of people and nations based on what we know about the present<sup>4</sup>—all the more so in the case of Japan, given its unique situation. Fertility dropped below the replacement rate in 1973, roughly 2.1 births per woman, and combined with a closed immigration system to leave an aging population and a declining labor force. Japan’s fertility rate plunged to 1.26 in 2005, before rebounding slightly to 1.39 in 2010. Potential GDP growth was going to be tamped down regardless of other actions Japan took. The degree to which this development was overlooked or excluded from sophisticated analysis is astonishing.

Tied to the demographic trend, demand for health care was set to shift economic activity to this sector, and toward services in general, where productivity was notoriously low. Despite productivity growth staying elevated in manufacturing, this secular shift restricted aggregate productivity advances and, therefore, Japanese living standards.

Rigidity in labor markets, overregulation of business inhibiting startups, monopolies bestowed in established markets, and uncompetitive import markets were just a few more antecedents that suppressed growth. Furthermore, a nation with a rapidly aging citizenry is not prone to risk-taking or highly innovative. Not to mention that Japan was overly reliant on its banking system and had an underdeveloped corporate bond market. This is where Japan found itself in the mid-1980s, but didn’t know it. And neither did the rest of the world.

## The Bubble Forms

The strong value of the U.S. dollar in the early-to-mid-1980s caused trade tensions to escalate, especially with Japan, evoking much angst among American manufacturers, and consequently in Washington, D.C. The response was the 1985 Plaza Accord among major industrial countries, with the signatories agreeing that the dollar was overvalued and central banks would act to correct the imbalance. The Bank of Japan tightened monetary policy in late 1985 and early 1986 and the overnight call money rate reached 8 percent by the end of 1985.

The rapid rise of the yen in reaction to the Plaza Accord undermined Japan’s competitiveness, as highlighted in Figure 1. At 260 yen per dollar in early 1985, the currency had appreciated more than 70 percent by early 1988, reaching 125, a remarkable ascent. The yen’s move was aided by accommodative monetary policy in America after the October 1987 stock market crash, which pushed down U.S. interest rates. This caused inflation-adjusted Japanese rates to climb relative to the U.S, pushing up the yen as inbound portfolio investment rose. Real GDP growth in Japan fell below potential in 1986 and 1987 as manufacturing exports suffered.<sup>5</sup> The BOJ loosened monetary policy, and short-term interest rates fell to 3 percent by early 1988.

Quietly at first, Japanese land and equity prices began to appreciate at a more rapid clip in 1986 than previously. This marked the beginning of the stock market and real estate bubbles, and each was enabled or reinforced by imprudent lending on the part of banks. Every real estate asset class appreciated, but commercial prices far outstripped industrial and residential gains. Commercial prices swelled more than 75 percent between 1986 and the 1991-1992 peak.<sup>6</sup> However, the stock market bubble was even larger proportionately. The Nikkei 225 index tripled between early 1986 and the end of 1989, rising from 13,000 to 39,000 when the bubble burst.

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4. William H. Frey and Ross DeVol, “America’s Demography in the New Century: Aging Baby Boomers and New Immigrants as Major Players,” Milken Institute, 2000, p. 10.

5. Alan Ahearne et al., “Preventing Deflation: Lessons from Japan’s Experience in the 1990s,” International Finance Discussion Papers 729, Board of Governors of the Federal Reserve System, June 2002.

6. Maurice Obstfeld, “Time of Troubles: The Yen and Japan’s Economy, 1985-2008,” Working Paper 14816, National Bureau of Economic Research, March 2009, pp. 6-7. <http://www.nber.org/papers/w14816>

Figure 1 | Yen exchange rate vs. U.S. dollar



Sources: Bank of England, Datastream.

It had been inflated, in part, by a financial system that fueled rapid economic growth in the postwar period but didn't adapt quickly to the internationalization and modernization of its leading corporate enterprises. Japanese businesses acquired the capital for investment from the banking system. This "indirect finance" was the primary conduit through which funds were channeled from savers to borrowers. Direct finance—corporate bonds, short-term securities, and equity markets—wasn't central to providing financing for investment until the 1980s.

The traditional banking system sought other customers for their loans as the leading corporations were increasingly able to self-finance through retained earnings and had access to global bond and equity markets. Japanese banks began to lend to more domestically oriented firms, including those in commercial and industrial real estate. The bubble was building.

## The Bubble Bursts

The Japanese government initiated a series of regulatory actions and fiscal policies to address the real estate and land bubble in 1990. They had success, but authorities weren't prepared for the unintended consequences on the banking sector and throughout the economy. By this time, land speculation had created the largest bubble. Prices in that sector peaked in 1991 and retreated relentlessly thereafter. Additionally, the Nikkei dived 41 percent by end of 1990 as the broader problems in the financial sector and the economy became apparent. By the third quarter of 1992, the index had sunk to around 16,000.

Private sector overinvestment in the late 1980s created excess capacity in manufacturing and construction.<sup>7</sup> Real GDP growth decelerated from an annual average of 5.8 percent from 1988 to 1990 to 3.3 percent in 1991, 0.9 percent in 1992, and 0.2 percent in 1993. While this performance was considered a growth recession in Japan, the 2.4 percent contraction in 1994 was a severe recession. Short-term interest rates fell to almost 2 percent by mid-1994. In this environment, one might have thought the yen would depreciate against the dollar and

7. Adam Slater, "Japan," Oxford Economics, December 2013, pp. 9-10.

other major currencies. Counterintuitively, the yen appreciated through April 1995. In retrospect, many wonder whether the BOJ cut rates aggressively enough. The high yen damaged Japan's efforts to mitigate the contraction gripping its economy. Further, to this day, experts testify that the appreciation occurred with no apparent macroeconomic reason.<sup>8</sup>

As the bubble burst, many banks that had extended huge corporate loans found that the underlying collateral had collapsed in value. A large proportion of firms that took out these loans labored to make their interest payments. Given the ties among several major banks and non-financial borrowers, not to mention the cultural abhorrence of losing face, the banks extended new loans so that interest payments could be made, keeping the loans current. The practice of “ever-greening” loans diverted funds that could have been channeled into productive purposes. Weak prudential regulations and enforcement resulted in excessive supervisory forbearance in the banking sector, causing additional problems.

## The Lost Decades

Eventually, Japanese banks had to accept that a high proportion of these loans were nonperforming. Smaller financial institutions began to fail during the 1992-1995 period. The virus spread, and three large banks failed subsequently. The banks took tremendous losses writing off the bad debt. More than 15 percent of total bank loans outstanding were written off in 1997. Instability grew in the banking system, and “zombie” firms and banks—technically functional but on life support—multiplied, while the flow of new funds finding productive investment waned. In 1998 and 1999, the Ministry of Finance took more assertive action by injecting capital into surviving banks.

The balance sheet problems at Japanese banks paralyzed new lending and proved to be a major encumbrance on the economy. Furthermore, a lethargic economy fed back on the financial sector, hindering its ability to heal. The dual effect persisted for many years. The Asian crisis that commenced in 1997 only exacerbated the negative spiral. At this point, the BOJ adopted a zero-interest-rate policy (ZIRP), flooding the market with liquidity.

Interest rates rose in 2000, but that rise was short-lived as a renewed economic slump got underway, pulling them back down. In March 2001, the Japanese stock market tumbled again as the technology bubble was bursting in the U.S., and the fallout rippled through the advanced economies. The extent of the cumulative decline in private wealth between 1989 and 2001 was a remarkable ¥1300 trillion (more than \$10 trillion), an amount two to three times greater than the nation's GDP in 2001.

Additional capital injections in 2001 and 2002 were insufficient to restore bank balance sheets to solvency, and operational challenges persisted. In April 2003, the Nikkei fell to less than one-fifth of its 1989 peak. Two more banks failed in 2005. This loss of wealth had a depressing influence on the behavior of businesses and consumers. Amid excess capacity, businesses lost confidence that additional investment would be rewarded by higher ROI. Consumers saw prices declining and choose to defer purchases of durable goods into the future.

Now focused on fighting deflation, the BOJ expanded the monetary base at a fast clip. From 2001 to 2006, it grew about 70 percent<sup>9</sup>—the first form of “quantitative easing” or QE, as exhibited in Figure 2. To put this in perspective, it is very close to the planned doubling of the monetary base by the end of 2014 under Abenomics.

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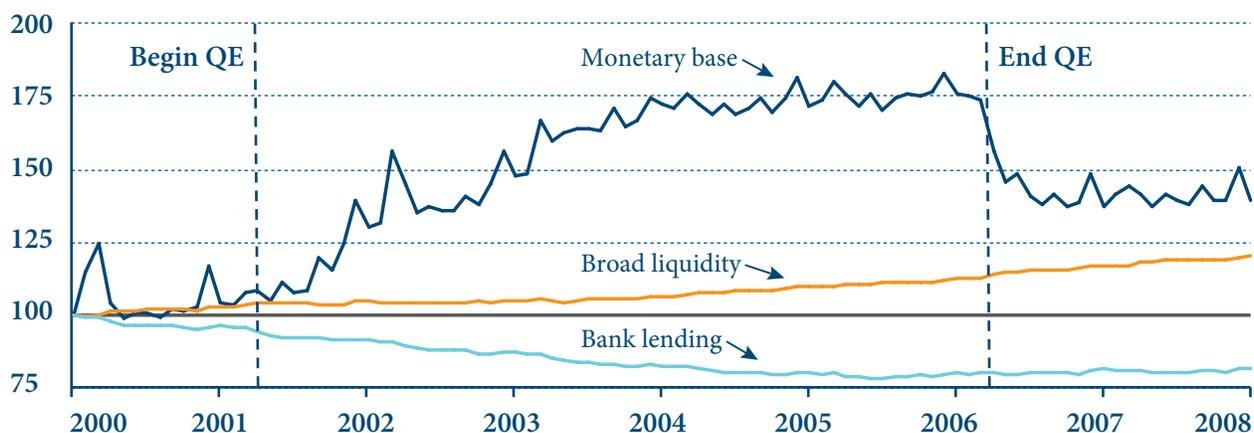
8. Takatoshi Ito and Frederic S. Mishkin, “Two Decades of Japanese Monetary Policy and the Deflation Problem,” in Takatoshi Ito and Andrew K. Rose, eds., *Monetary Policy with Very Low Inflation in the Pacific Rim*, (Chicago: University of Chicago Press, 2006) pp. 131-93.

9. “World Economic Prospects: Japan Special Focus,” *Oxford Economics*, May 2013.

The BOJ stated that it intended to push the movement of the consumer price index (CPI) into a positive direction. By 2006, the economy appeared to be on a more sustainable growth track and inflation was edging into positive territory. Between 2004 and 2007, for example, real GDP growth averaged 2.2 percent. Prime Minister Junichiro Koizumi argued that the end of deflation was near, although not yet fully achieved.

**Figure 2 | Japan's quantitative easing 2001-2006**

Indices (Jan. 2000 = 100)



Sources: Bank of Japan, Datastream.

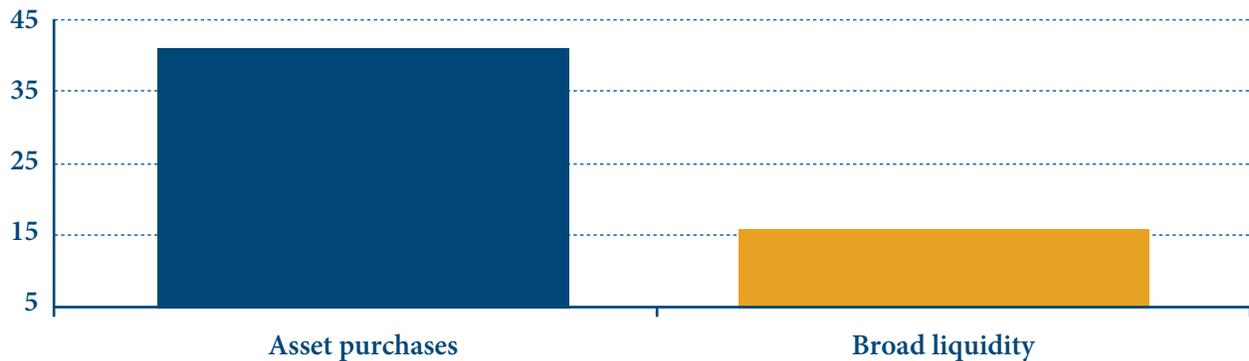
Officials overlooked how poorly the program was performing in boosting the broader monetary aggregates as opposed to the monetary base from 2001 to 2006. Broader measures of monetary liquidity averaged annual gains of just 2 percent over this period, substantially less than the 3.4 percent average advance from 1993 to 2000. A principal explanatory factor was that the BOJ's open market operations were focused on purchasing short-term assets from banks, not long-term ones, thereby leading to modest growth in the money supply. Another indicator of the lack of success: Bank loans outstanding dropped 15 percent while QE was in effect.

Next, the global financial crisis hit in 2008, throwing Japan into a severe recession. Despite little exposure to subprime mortgage products, Japan's financial system was subject to counterparty risk from its key trading partners: the United States and Europe. The 30-percent-plus collapse in global trade, compounded by the yen's status as a safe haven in anxious times, strengthened the currency against the dollar and on a multilateral basis. Japan suffered from plunging exports because of both factors and the large multiplier effects across its economy. In 2009, the Asian nation witnessed a 5.5 percent contraction in real GDP.

The response was the 2010-2012 QE program, but it had important structural shortcomings of its own. Too much emphasis was placed on the BOJ's purchasing of short-term assets (principally Japanese government securities), mostly held by banks. As a consequence, the transference to broader monetary growth was minimal, as displayed in Figure 3. The 2011-2012 asset purchases reached ¥41 trillion. However, the broadest money supply measure increased by just ¥16 trillion. Compounding Japan's problem in boosting aggregate activity was the March 2011 earthquake, tsunami and nuclear reactor catastrophe.

**Figure 3 | Japan's quantitative easing 2011-2012**

Change from year-end 2010 to year-end 2012 (trillion yen)



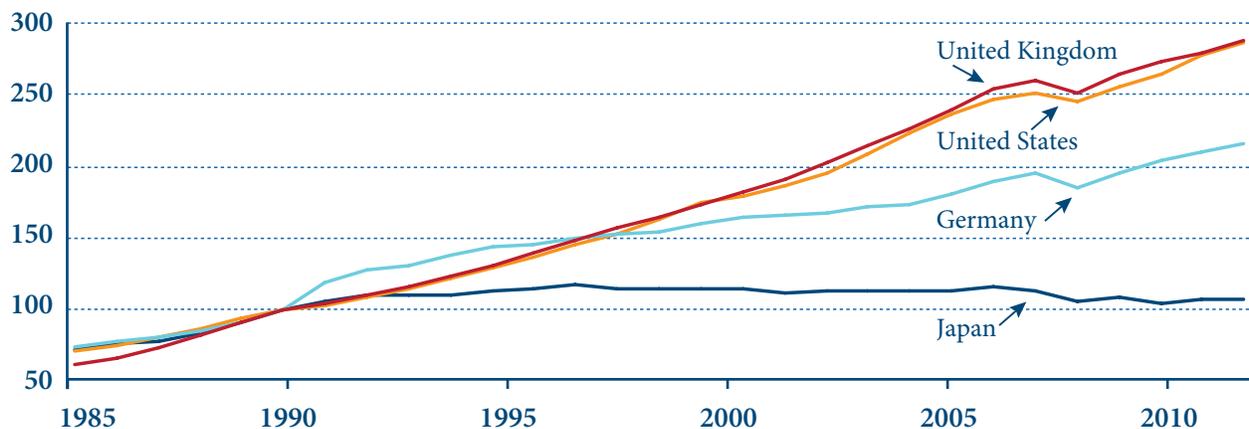
Source: Oxford Economics.

Amid political scandals and poor economic performance, several prime ministers had been forced to resign. Shinzo Abe, pressured to step down in 2007, made a political comeback in 2012, promising aggressive policies to restore growth and break deflation's grip on society, also known as Abenomics. A key element, "Arrow 1" was a comprehensive monetary policy to end deflation. If in the process it caused the yen to depreciate and spur exports, all the better. Further, a weaker yen might raise import prices and help slay the deflation dragon. Some officials outside Japan believe that depreciation is an intended element of the strategy to recapture growth.

The cumulative effect of the "lost decades" on Japan's economic record has been devastating, on both absolute and relative scales. Figure 4 demonstrates Japan's abysmal nominal GDP performance since 1985. Recently, it was roughly 5 percent larger than in 1990 and still 8 percent smaller than at the end of 1997, thanks to persistent deflation. The United Kingdom and United States have seen their nominal GDPs rise by more than 150 percent since 1990, while Germany's has doubled. Undeniably, Japan does better on real GDP, where it has seen average annual growth of 0.8 percent since 1990, versus 2.2 percent for the advanced economies overall.

**Figure 4 | Japan's GDP vs. other advanced nations**

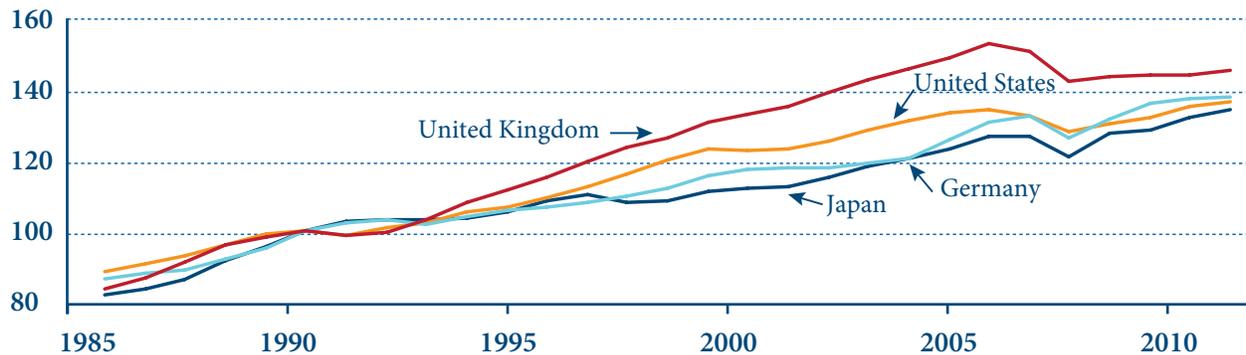
Nominal GDP indices (1990 = 100)



Source: Datastream.

## Figure 5 | Japan's productivity vs. other advanced nations

Real GDP per working age person indices (1990 = 100)

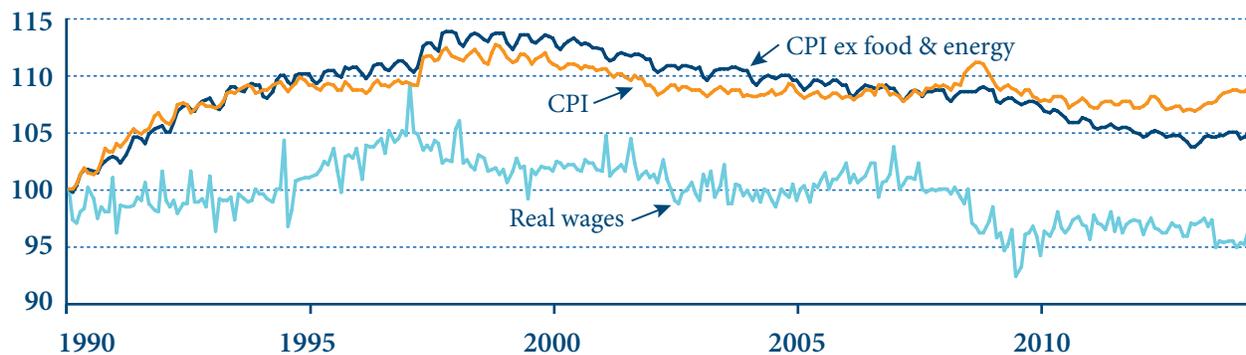


Source: Datastream.

As Figure 5 shows, Japan's real GDP per person of working age, a crude measure of productivity, has performed much better. The data demonstrate an increase of 34 percent since 1990, while the U.S. track record shows it up 37 percent over the same period, matching Germany. Japan's manufacturing sector has enjoyed strong productivity gains, but its productivity growth in services hasn't kept pace. If Japan's performance in services improves, that could provide a much-needed boost to potential GDP. Nevertheless, when contemplating debt dynamics, nominal GDP is most relevant.

## Figure 6 | Japan's CPI and real wages

Indices (Jan. 1990 = 100)



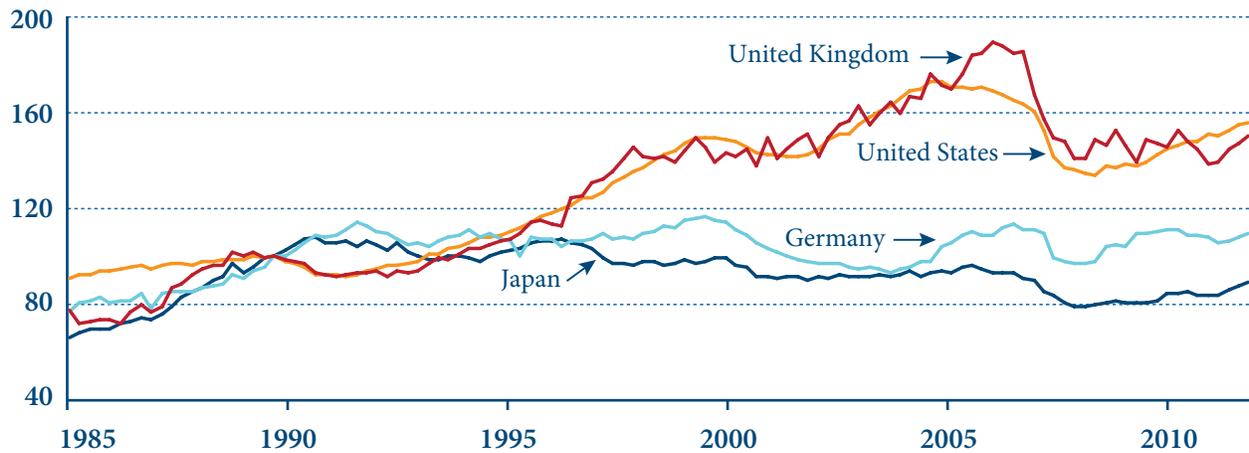
Source: Datastream.

With real GDP rising, but nominal GDP flat to down, an unusual picture is being painted, and the brush stroke is falling prices. With oil prices spiking in 2008, overall prices shot higher but just temporarily. Indeed, the CPI has been on a downward spiral since the late 1980s. Excluding food and energy, the index has fallen approximately 8 percent since 1998. In April, the CPI jumped in reaction to the sales tax increasing from 5 to 8 percent. It remains to be seen how much of the CPI's move is sustainable. However, the biggest story in Japan might be the decline in real wages. They have been sliding since the late 1990s as well. Much of this reduction is attributable to the shrinking bonus component in the wake of the global recession, illustrated in Figure 6. Increasing purchasing power from falling prices has been counteracted by leaner nominal incomes.<sup>10</sup>

10. Julian Jessop, "Japan Economic Focus: Will 'Abenomics' Transform Japan?" Capital Economics, May 2013, p.3.

**Figure 7 | Japan's real investment vs. other advanced nations**

Real gross capital formation indices (1990 = 100)

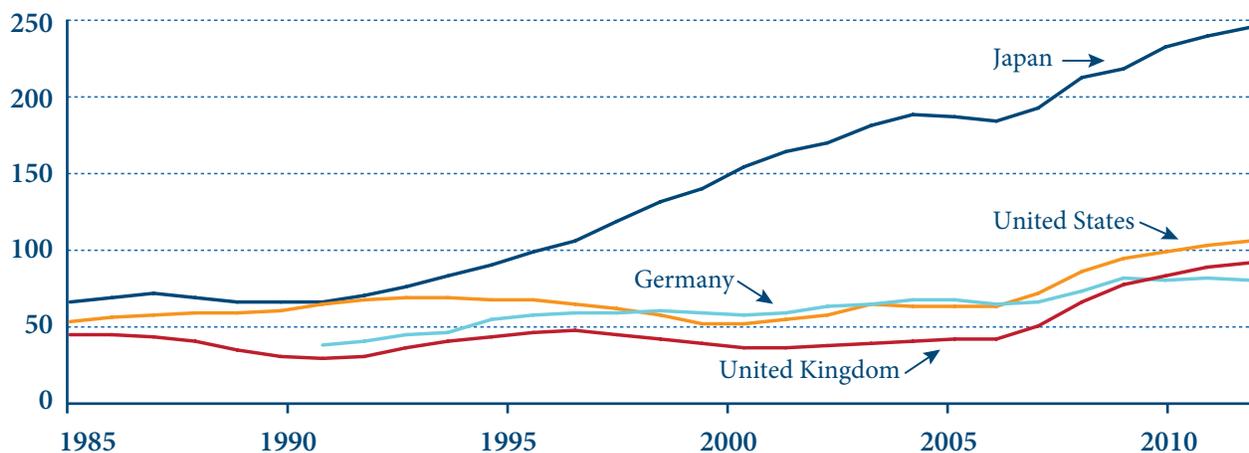


Sources: Datastream, Federal Reserve.

Excess domestic capacity due to manufacturers outsourcing facilities throughout developing Asia amid yen strength, combined with a balance-sheet-constrained banking system, weakened domestic capital formation. Additionally, the negative psychology associated with falling prices reinforced risk aversion, and corporate savings mushroomed. By the end of 2012, real gross capital formation was 16.6 percent below its 1990 value (see Figure 7). On this basis, the U.S. performed best. The main challenge for Japan is to get firms to spend, and for that to happen, their confidence in the future must be restored.

**Figure 8 | Japan's government debt vs. other advanced nations**

Gross general government debt (percent of GDP)



Source: Datastream.

The government's attempts to stimulate aggregate demand have left it with a large debt burden. Gross government debt exceeded 240 percent of GDP in 2012; though it looks better on a net basis, it still is about 140 percent (Figure 8). Despite high government debt levels in Europe and the U.S., they pale in comparison. The U.S. net debt is around 75 percent of GDP.



# Abenomics and the Three Arrows

Japan is a society that responds most expeditiously to extreme events. The combination of the “lost decades,” the global financial crisis, and the Fukushima nuclear disaster seemed to finally tip the consensus toward taking more drastic economic action, requiring new political leadership. Candidate Abe talked of “unlimited easing”<sup>11</sup> in his campaign speeches and threatened to abolish the Bank of Japan’s independence if it didn’t comply. His tactics appeared to work; he was elected prime minister in the fall of 2012 and took office in December.

Abenomics’ “three arrow” reference is based on an old legend from Yamaguchi, Japan, where Abe hails from. The story is about a lord who asked each of his three sons to snap an arrow, which they did easily. Next, he produced three more arrows for each son and told them to break them all simultaneously. None could.<sup>12</sup> The lesson: Work alone and your effectiveness is limited. Work in unison and be as strong as three arrows.

Abe should add another arrow to his program or, perhaps more accurately, a quiver in which to place the arrows. Cooperation from politicians, government ministries, the Bank of Japan, and corporations will be essential in determining whether his policies succeed. Previously, a lack of collaboration doomed attempts to resurrect the economy.<sup>13</sup> The corporate sector never fully trusted the commitment to achieving these goals, thereby making it a self-fulfilling prophecy because animal spirits needed to be aroused for success.

Abe appointed Haruhiko Kuroda governor of the Bank of Japan in February 2013 to implement aggressive monetary action. Abe felt his selection of Kuroda, once head of the Asian Development Bank, would send the message that bold monetary actions were on the way. Kuroda had long been a critic of the Bank of Japan because of its halfhearted monetary policy efforts, as opposed to the overwhelming “shock and awe” effect he believed Japan needed.

The BOJ has adopted a clear inflation objective by stating its policy is to achieve a 2 percent target “as soon as possible.” A specific target had never been announced in past monetary programs. Second, the BOJ committed to doubling the monetary base over two years. This is an important step, but isn’t quite as bold as it appears. It is less than the Federal Reserve and the Bank of England have already implemented. Yet in both cases, inflation has been falling, not rising. With the gap between actual and potential GDP still so large, this is not very encouraging for a country in the grip of deflation such as Japan.

Nevertheless, the more qualitative aspects of this policy, such as its communications strategy and a lengthening of the maturity of the government bonds being purchased, are significant improvements.

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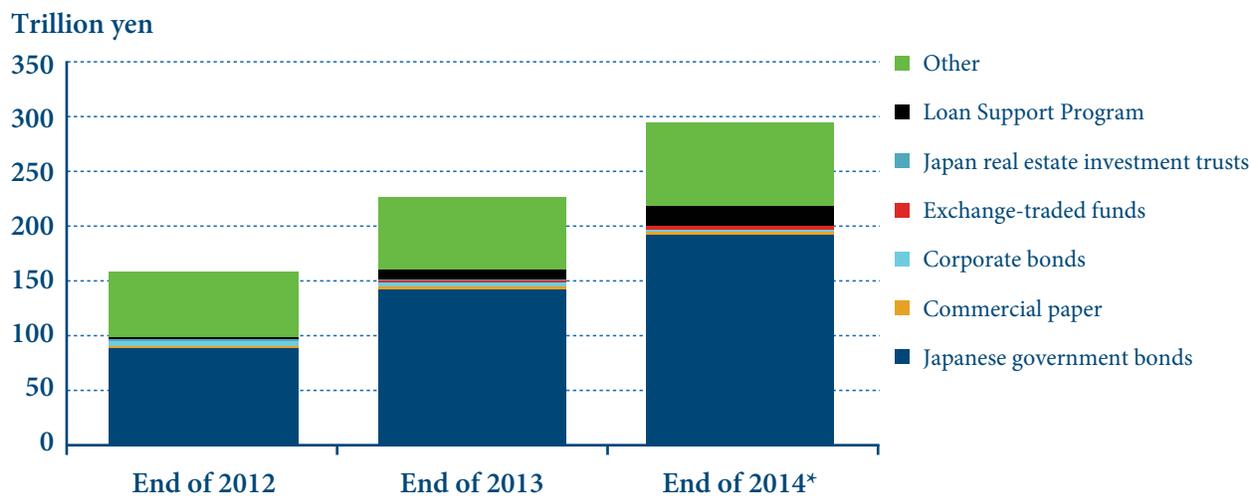
11. Brian Bremner, “The Sugar High of Abenomics,” *Bloomberg Businessweek*, June 10-16, 2013, p. 13.

12. “Japan and Abenomics: Once More with Feeling,” *The Economist*, May 18, 2013.  
[www.economist.com/news/briefing/21578052-shinzo-abe-shaking-up-japans-economy](http://www.economist.com/news/briefing/21578052-shinzo-abe-shaking-up-japans-economy)

13. Julian Jessop, “Japan Economic Focus: Will “Abenomics” Transform Japan?,” *Capital Economics*, May, 2013, p.3.

The expected doubling of the monetary base to ¥270 trillion by the end of 2014 represents 55 percent of GDP. These asset purchases amount to roughly ¥7 trillion per month, principally in government bonds. Most importantly, the BOJ is widening the range of bonds it is purchasing to include all maturities. The goal is to extend the average duration of assets on its balance sheet from three years to seven.<sup>14</sup> Further, it is proceeding with the purchase of private assets, mainly real estate investment trusts (REITs) and exchange-traded funds, to stimulate activity directly, as summarized in Figure 9.

**Figure 9 | Bank of Japan's balance sheet assets**



\*Projected

Source: Bank of Japan.

The monetary bazooka already had an impact on the value of the yen. It has depreciated 24 percent to 103 yen per dollar and more than 20 percent on a trade-weighted basis. The CPI has stopped falling, but the price level hasn't begun a renewed upswing. The Nikkei 500 has risen more than 40 percent since the program was announced.

Fiscal stimulus, the second arrow, is the aim of a ¥20.2 trillion package, roughly 4 percent of GDP, spread over two to three years. The first component is a standard infrastructure plan worth ¥10.3 trillion, including the construction of earthquake-resistant bridges, roads, tunnels, and other projects in response to the 2011 disaster.<sup>15</sup> The bulk of this spending would likely have occurred even under a different government, and relative to the government spending that was underway in 2012, it represents a minor, incremental stimulus. An additional piece of the fiscal package is aimed at stimulating alternative-energy programs.

The last component is actually a major tightening. The consumption tax is being doubled over two years. It rose from 5 percent to 8 percent in April and will hit 10 percent in April 2015. Japan needs to bring fiscal discipline to the government sector, but this degree of austerity lessens the overall program's prospects for success. Because Japan had already loosened fiscal policy in response to the global financial crisis, more than any other advanced economy, it has reduced the degrees of freedom for Abenomics' effectiveness.

14. Dennis Botman and Keiko Honjo, "Effects and Spillover Channels of Successful Reflation in Japan," Regional Economic Outlook Asia and Pacific, IMF, April, 2013, pp. 10-11.

15. John W. Labuszewski, "Focus on Abenomics: What Does It Mean for CME Group Markets?" CME Group, August 14, 2013, p. 3.

Arrow No. 3, structural reforms, is the most important for long-run success. Shortly after legislation was passed in 1998 giving the Bank of Japan independence from the Ministry of Finance, the central bank argued for structural reforms. The BOJ's view was that the prolonged recession was a structural problem that should be addressed with the correct weapons. To succeed, Abenomics' third arrow must boost labor force participation, allow more immigration, reduce trade restrictions, and, ultimately, enhance multifactor productivity growth.

The specific actions announced thus far are limited in scope but provide flexibility for additional actions in the future. The Abe administration has made regulatory reforms in business that should aid hiring, made modest changes in allocating visas for skilled workers, and loosened some restrictions on dismissing workers. It has expanded child-care programs and increased labor mobility to raise female workforce participation. The female rate is 63 percent, much lower than the male rate of 94 percent.<sup>16</sup>

Japan has joined discussions on the Trans-Pacific Partnership, a proposed free-trade agreement among the U.S., Mexico, Canada, Chile, Peru, Australia, New Zealand, Brunei, Malaysia, Singapore, and Vietnam. There was agreement between the Abe administration and the Diet on allowing nonprescription drugs to be purchased online and patients to pay extra for treatment without forfeiting public health insurance support. Additionally, the administration is contemplating directing the Government Pension Investment Fund (GPIF), the world's biggest public-sector investor, to increase the allocation of assets to equities and reduce the proportion in low-yielding government bonds.<sup>17</sup> It remains to be seen whether the actions will be sufficient to promote long-term growth, but Abenomics offers Japan reason for hope.

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16. Carl Astorri, "Launching the Third Arrow of Abenomics," Oxford Economics, August 6, 2013, p.4.

17. "Japan's Pension Giant: Risk On," The Economist, March 15, 2014.  
[www.economist.com/news/finance-and-economics/21599056-worlds-largest-pension-fund-changing-way-it-invests-big?frsc=dg%7Ca](http://www.economist.com/news/finance-and-economics/21599056-worlds-largest-pension-fund-changing-way-it-invests-big?frsc=dg%7Ca)

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# Yen Depreciation and Impacts on Trade and Investment

**T**he most immediate effect of the first arrow of Abenomics, aggressive monetary action and inflation targeting, has already been felt in currency markets. The yen fell rapidly against the currencies of Japan's top trading partners; market participants anticipated that the doubling of the monetary base would cause Japan's real interest rates to fall. Currency markets tend to discount the future rapidly, integrating forecasts into today's prices. The depreciation of the yen is necessary for Abenomics to work, but likely an insufficient condition for overall success. Macroeconomic observers might differ on the extent of depreciation required, but not on its necessity.

Some finance officials believe that Japan is engaging in a “currency war,” in the words of Brazilian Finance Minister Guido Mantega.<sup>18</sup> The currency war idea stems from a beggar-thy-neighbor philosophy of manipulating exchange rates—essentially a competitive devaluation—by buying foreign currencies and selling the domestic currency in international markets to drive your currency's exchange rate lower.

However, Japan's policy doesn't fit neatly into the currency war terminology because officials aren't directly intervening in foreign exchange markets. Japanese officials point out that they are managing domestic monetary policy to end deflation and push down real interest rates. Japan views this as a benign devaluation and a byproduct of perfectly legitimate open market operations. So far, most advanced economies are willing to give Japan a pass on this issue. Although that may change if Japan's exports accelerate, harming competitors' trade performance and GDP growth.

There are several channels through which yen depreciation could boost Japanese economic growth. The first is through the relative price impact on foreign trade. A decline in the exchange rate against the currencies of nations with which Japan frequently trades will tend to lift Japanese exports, holding other factors constant. This is because the prices of those goods and services fall in foreign currency terms. Purchasing Japan's exports becomes less expensive for its trading partners.<sup>19</sup>

Another important way a weaker yen could boost the Japanese economy is through the substitution of domestic goods and services for imports. As the yen depreciates against the currencies of heavy exporters to Japan, foreign firms must raise prices in yen terms to take in the same amount of revenue. In response, Japanese consumers and businesses purchase more from domestic firms and less from foreign firms.

Unfortunately, the pass-through of changes in yen value to export and import prices is somewhat more nuanced than the description above. Japanese firms selling into foreign markets may decide not to reduce prices as much as the yen declined, improving profits, but export volume might not increase as much as with full pass-through. Additionally, foreign firms selling goods and services in Japan may

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18. Alice Ross, “Abenomics Propels Yen Weakness,” *Financial Times*, May 10, 2013.  
<http://www.ft.com/intl/cms/s/0/dbdc8d5c-b8d9-11e2-869f-00144feabdc0.html?siteedition=intl#axzz35gnuJ5ED>

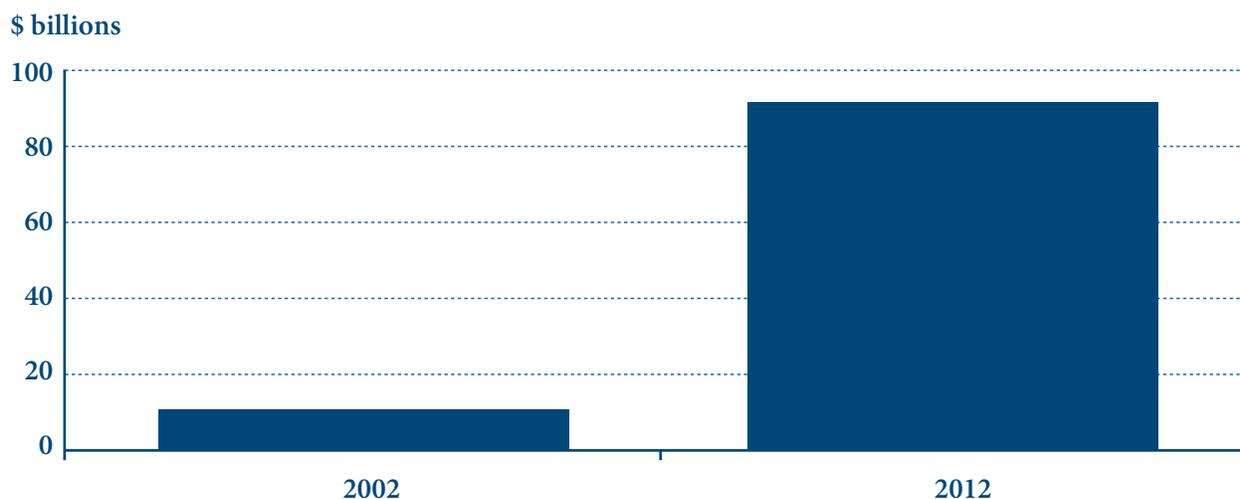
19. Ross C. DeVol, “The Asian Crisis Tsunami: Trade and Other Impacts on California and the United States,” Milken Institute, September, 1998, pp. 28-29.

decide not to increase prices in yen terms, or increase them less than the yen has declined. That might compress their profit margins but maintain their market share. The pass-through rate is the ratio of the percentage increase in import prices to the percentage depreciation of the yen.<sup>20</sup>

Yen depreciation also affects trade flows through what international trade economists call “cross-price elasticity effects.” This involves the links among three or more countries. For example, take Japan, the U.S., and South Korea. The yen has fallen against the dollar, but the won has not, indicating that South Korean exporters could lose sales in the U.S. to Japanese firms because the prices of the latter’s goods and services decline relative to South Korea’s. So South Korea may not see its exports to Japan fall by much but could lose proportionally more exports in third-country markets. In this sense, Japan’s exports are substitutes for South Korea’s. This relationship between currency and trade flows can be nuanced and variable over time.

Other factors will affect how Japan’s exports and imports respond to the current depreciation of the yen. The dynamics of how trade flows respond to exchange rate fluctuations depend on past investment in domestic and foreign capacity and utilization rates. For example, in the past Japanese firms responded to yen appreciation by outsourcing manufacturing capacity to China and other Association of Southeast Asian Nations (ASEAN) members to benefit from lower labor and other production costs.<sup>21</sup> Japan’s foreign direct investment in China rose from \$12.4 billion in 2002 to \$93 billion in 2012 (as displayed in Figure 10), more than a seven-fold increase in a decade. Most of this FDI was focused on industries in which Japan is a heavy exporter.

**Figure 10 | Japan’s FDI position in China**



Source: Organization for Economic Co-operation and Development.

This implies that Japan’s exports may not respond as vigorously to yen depreciation as they did in the past because capacity has been added in China, and to a lesser extent, the U.S. New patterns of Japanese FDI are emerging in Thailand, the Philippines, and other ASEAN members. Alternatively, Japan may not have extensive domestic capacity in industries in which imports are concentrated. Japan’s firms may have to invest in domestic capacity in response to sustained yen weakness before we see a dramatic effect on economic growth.

20. Etsuro Shioji, “The Evolution of the Exchange Rate Pass-Through in Japan: A Re-Evaluation Based upon Time-Varying Parameters VARS,” Policy Research Institute, Ministry of Finance, Japan, Public Policy Review, Vol. 8, No. 12, June, 2012, pp. 68-69.

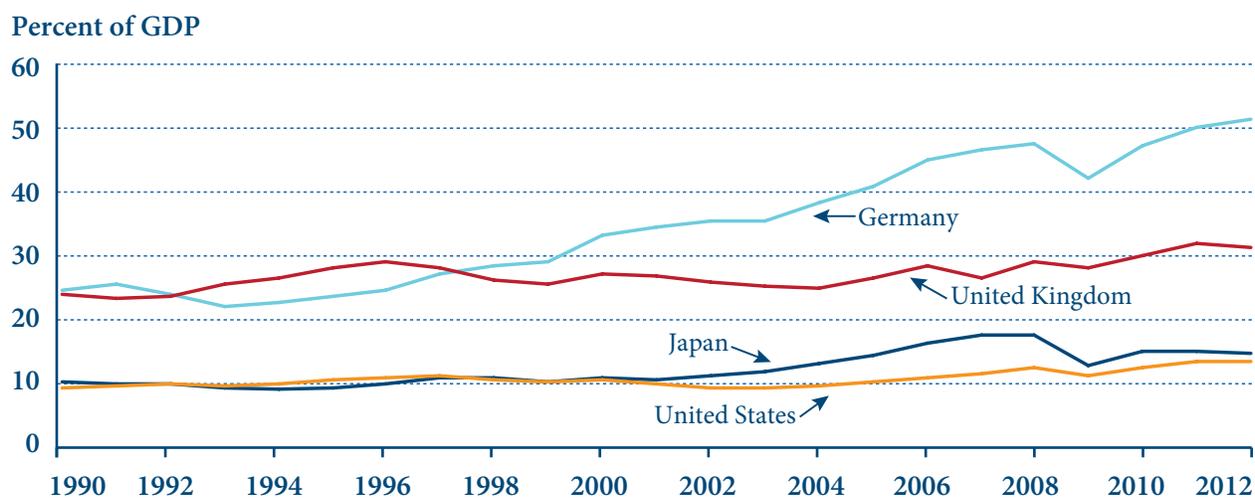
21. Y. Xing, “Japanese FDI in China: Trend, Structure and the Role of Exchange Rates,” in K.H. Zhang (Ed.), *China as the World Factory* (Routledge, Taylor & Francis).

# The Changing Structure of Japan's Trade Patterns

Many additional factors come into play. The changing patterns of Japan's exports and imports with specific nations, the industry composition and value-added nature of cross-border commerce, the proportion of intermediate products to finished products, and vertical specialization are critical elements of how the falling yen influences Japan's economy. The term "vertical specialization" describes the sequential mode of production that develops as a nation becomes more integrated into the global supply chain. For example, as Nation B imports more of a particular good from Nation A, Nation B uses it as a component in the production of its own good, then exports that intermediate good to Nation C in the value chain, and that supply chain process continues until the assembled good arrives at its final point of sale.<sup>22</sup> As we shall see, this vertical specialization process has been particularly acute in Asia, with Japan at the center.

Much of Japan's post-World War II success was based on its economic development strategy of targeting industries that could become export champions. This approach was emulated by Asian Tigers such as South Korea. Furthermore, Japan suppressed imports through the use of tariff and non-tariff barriers. Japan's export leaders, both industries and firms, achieved remarkable success in a short time. Nevertheless, trade was never as large a share of Japan's GDP as it was in most advanced nations. That might be attributable in part to it being an island nation without land borders, as well as a reticence toward further economic integration on the part of Asian nations that had been invaded by Japan. At their peak in 2007, Japan's exports reached 18 percent of GDP. For comparison, German exports totaled 52 percent of GDP in 2013, and for the U.K., it was 32 percent. See Figure 11. Products had to move by ship, or in the modern era in the case of electronic and telecommunications components, by airplane due to their high value and small size.

**Figure 11 | Japan's exports relative to GDP vs. other advanced nations**



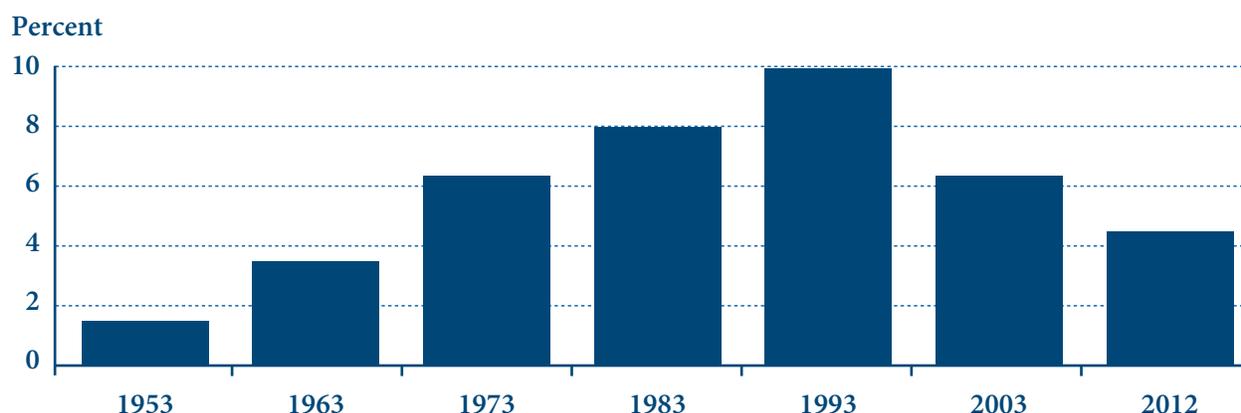
Source: World Bank.

22. David Hummels, Dana Rapoport, and Kei-Mu Yi, "The Nature of Growth and Vertical Specialization in World Trade," *Journal of International Economics*, Elsevier, Vol. 54, Issue 1, June 2001, pp.75-96.

# Merchandise

Despite these obstacles, Japan's major export sectors rose to prominence on the world stage. Autos, consumer electronics, computers, semiconductors, steel, aerospace, shipbuilding, and chemicals were the leaders. In 1963, Japan accounted for 3.5 percent of world merchandise trade, up from a meager 1.5 percent a decade earlier. Just prior to the OPEC I oil crisis in 1973, Japan's share of world merchandise trade rose to 6.4 percent, and before the Plaza Accord, it had expanded to 8 percent. Even as the bubble began to burst in 1993, Japan's share peaked at 9.9 percent. A decade later, it had fallen to 6.4 percent and stood at just 4.5 percent in 2012 (Figure 12).

**Figure 12 | Japan's share of world merchandise exports**



Sources: IDE-JETRO, World Trade Organization.

The destinations of Japanese exports have undergone a fundamental realignment over the past two decades, as illustrated in Table 1 (Japan's merchandise exports by partner country), which lists Japan's top 10 markets based on 2012 data. In 1992, the U.S. received 28.4 percent of Japan's exports, with a large proportion of it in the auto sector. Even as the U.S. pressured Japan to pare its bilateral trade surplus, it accounted for 28.9 percent of Japan's exports in 2002. The yen's rise against the dollar led to Japanese auto companies expanding capacity in the U.S., and by 2012, Japanese exports to the U.S. represented just 17.5 percent of the total.

**Table 1 | Japan's merchandise exports by partner country**

	1992	2002	2012
China	3.5%	9.6%	18.1%
United States	28.4%	28.9%	17.5%
S. Korea	5.2%	6.9%	7.7%
Taiwan	6.4%	6.6%	5.8%
Thailand	3.1%	3.2%	5.5%
Hong Kong	6.1%	6.1%	5.1%
Singapore	3.8%	3.4%	2.9%
Germany	6.0%	3.4%	2.6%
Indonesia	1.6%	1.5%	2.5%
Australia	2.1%	2.0%	2.3%

Sources: Chinese Taipei Bureau of Foreign Trade, JETRO, UN Comtrade.

The major story in Japan's changing export pattern has been China. It was Japan's eighth-largest market in 1992, accounting for 3.5 percent of its total exports. By 2002, China had jumped to second overall and represented 9.6 percent of Japanese merchandise exports. China moved to first in 2011, surpassing the U.S., and now accounts for 18.1 percent. Between 2002 and 2012, China accounted for half of Japan's export growth, while only 6 percent of China's increase has been attributable to Japan. It is evident that Japan needs China's consumers and businesses to prosper.<sup>23</sup>

A related story is the rise of ASEAN members such as Thailand, Indonesia, and Malaysia. Thailand saw its share of Japan's merchandise exports increase from 3.1 percent in 1992 to 5.5 percent in 2012, moving from eighth to fifth place. Similarly, Indonesia leaped from 15th in 1992 to ninth in 2012 among Japan's merchandise export destinations. In the aggregate, ASEAN members' share rose from 12.1 percent in 1992 to 16.1 percent in 2012. South Korea's share of Japan's exports rose from 5.2 percent in 1992 to 7.7 percent in 2012, bringing it to third overall. Western European nations saw their portion of Japan's exports fall from 19.3 percent in 1992 to 9.9 percent in 2012, as the UK fell out of the top 10.

Japan's top 10 merchandise products, based on 2012 data, are listed in Table 2 (Japan's merchandise exports by product). While the categories didn't adjust as much over time as countries, there were notable changes in mix.

**Table 2 | Japan's merchandise exports by product**

	1992	2002	2012
Vehicles other than railway, tramway	23.2%	22.6%	20.4%
Machinery, nuclear reactors, boilers, etc.	22.3%	20.2%	19.9%
Electrical, electronic equipment	22.0%	21.5%	15.8%
Optical, photo, technical, medical, etc. apparatus	5.4%	5.5%	5.7%
Iron and steel	3.0%	3.2%	4.9%
Commodities not specified elsewhere	1.5%	4.1%	4.4%
Plastics and articles thereof	1.8%	2.5%	3.6%
Organic chemicals	2.2%	2.8%	2.9%
Ships, boats, and other floating structures	2.3%	2.2%	2.8%
Articles of iron and steel	1.8%	1.4%	1.9%

Sources: International Trade Centre, UN Comtrade.

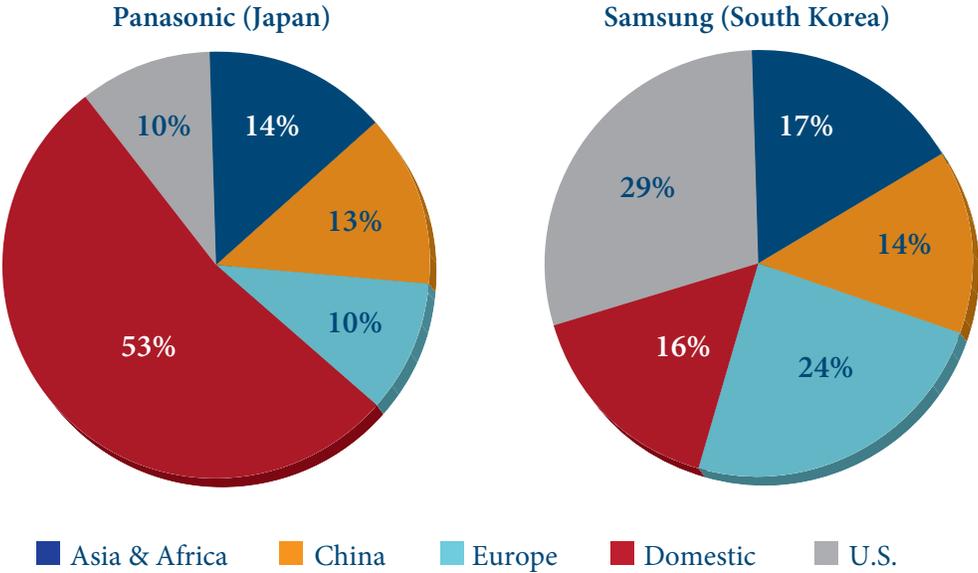
Vehicles' share of Japan's total exports was 23.2 percent in 1992, declining to 20.4 percent in 2012. Given the outsourcing of light vehicle production to the U.S. due to fears of protectionism and the rising yen, this decline was relatively modest. Toyota, Honda, and Nissan all have so-called transplant operations in the U.S., and Japan has invested in operations in China and other parts of Asia. Nevertheless, the major automakers retain substantial production facilities in their home country. For example, Toyota's Lexus luxury division produces almost all its vehicles in Japan and fills foreign demand through exports.<sup>24</sup> Japan still produces a wide range of automotive components and ships them abroad for final assembly.

23. Ross C. DeVol, "Is the New Year Too Happy? The Global Economic and Financial Markets Outlook," Milken Institute, February 2013, pp.23-25.

24. Japan Inc., Top 10 Japanese Exporters. <http://www.japaninc.net/top-10-japanese-exporters/> accessed March 19, 2014.

The second-largest export sector is machinery. In 2012, it represented 19.9 percent of Japanese exports, down from 22.3 percent in 1992. This is a large category including Mitsubishi manufacturing equipment, laser-guided machine tools, and heavy capital equipment such as Komatsu bulldozers. Historically, Japan supplied these capital goods to emerging Asian nations and other advanced economies. No. 3 is electrical and electronic equipment. Today, it represents 15.8 percent of Japan's exports, declining from 22 percent in 1992 and demonstrating that Japan has lost share in world markets. China, South Korea, and other emerging Asian nations have acquired market share in consumer and telecommunications equipment at Japan's expense. For example, Panasonic, one of Japan's top exporting firms, has a low foreign share of sales compared to South Korea's Samsung, as depicted in Figure 13. Based on 2011 data, Samsung generated 84 percent of sales revenue outside the country, while Panasonic's proportion was just 47 percent.

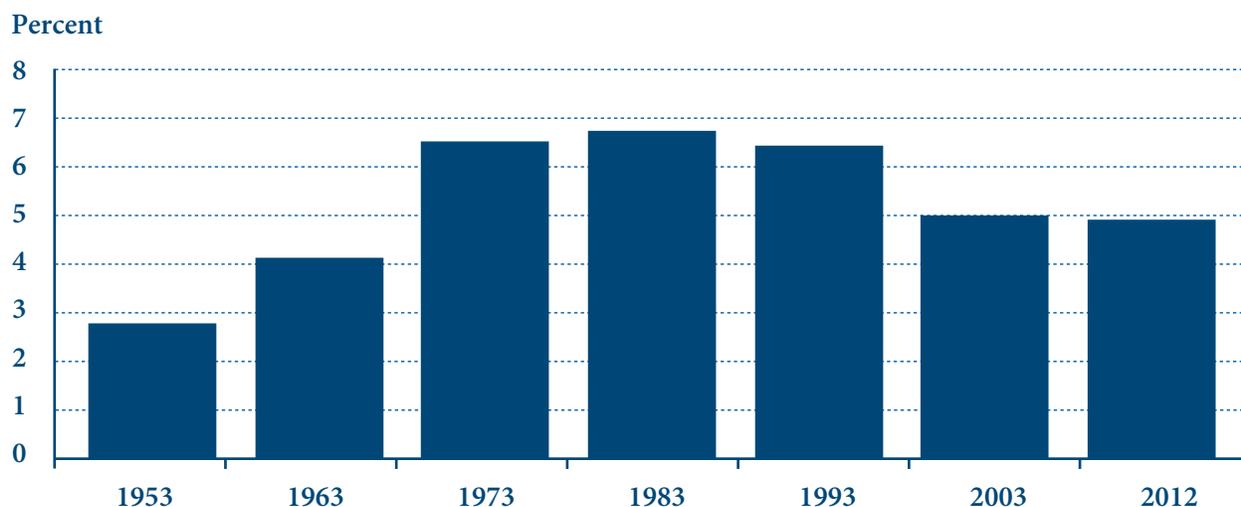
**Figure 13 | Foreign share of sales: Panasonic vs. Samsung (2011)**



Source: Japan Ministry of Economy, Trade and Industry.

Optical, photographic, technical, and medical apparatus is an important element of Japan's export mix at 5.7 percent, and that share has remained fairly constant. Hitachi is a key exporter of medical equipment. Iron and steel is the fifth-largest category despite the loss of competitiveness due to the high yen, highlighting the efficiency of Japanese steel producers such as Mitsui & Co. Other important export categories include plastics, organic chemicals, ships and boats, and articles of iron and steel. Combined, the top 10 merchandise categories account for 82.3 percent of Japan's total exports.

Figure 14 shows that Japan's merchandise imports never accounted for more than 6.7 percent of the world total, peaking in 1983. Imports were minimized to protect and build domestic industrial capacity. Nevertheless, as Japan's economic growth accelerated in the 1960s, imports rose from 2.8 percent of the world total in 1953 to 6.5 percent in 1973. Most of the increased penetration was in energy due to rising oil prices and volumes—Japan had virtually no domestic oil production so its growth had to be fueled by imports. In 2012, Japan's merchandise imports represented just 4.9 percent of the world total.

**Figure 14 | Japan's share of world merchandise imports**

Sources: IDE-JETRO, WTO.

The sources of Japan's imports have changed even more thoroughly than the markets for its exports. As highlighted in Table 3 (Japan's merchandise imports by partner country), the United States was the largest source of imports in 1992, representing 22.6 percent of the total. By 2002, the U.S. share had dropped to 17.4 percent, plummeting to just 8.6 percent in 2012. The U.S. became the second-largest source of Japan's imports. Although Japan didn't account for as much of the growth in China's exports as China did for Japan's, its contribution wasn't inconsequential. In one decade, China jumped from providing 7.3 percent of Japan's imports (1992) to 18.3 percent (2002), certainly one of the largest gains over a single decade in modern times. By 2012, China had captured 21.3 percent of Japan's merchandise imports, with much of the growth in consumer electronics and machinery.

**Table 3 | Japan's merchandise imports by partner country**

	1992	2002	2012
China	7.3%	18.3%	21.3%
United States	22.6%	17.4%	8.6%
Australia	5.3%	4.2%	6.4%
Saudi Arabia	4.4%	3.4%	6.2%
United Arab Emirates	4.2%	3.4%	5.0%
S. Korea	5.0%	4.6%	4.6%
Qatar	0.9%	1.6%	4.0%
Malaysia	2.8%	3.3%	3.7%
Indonesia	5.2%	4.2%	3.6%
Germany	4.6%	3.7%	2.8%

Sources: Chinese Taipei Bureau of Foreign Trade, JETRO, UN Comtrade.

Australia is the third-largest source of Japan's imports. Its share rose from 4.2 percent in 2002 to 6.4 percent in 2012, driven largely by Japan's need for energy and raw materials. Saudi Arabia followed in fourth, the United Arab Emirates was fifth and Qatar seventh. These three OPEC members represented 15.2 percent of Japan's

total imports, up from 9.5 percent in 1992. Economic growth propelled the need for additional oil supplies as well as the 2012 effort to replace the electrical capacity lost after the Fukushima nuclear plant disaster.

The ASEAN countries contributed a larger share of Japan's imports in 2012 than in 1992, but the gains were less than those for exports. In 1992, ASEAN countries provided 13.9 percent of Japan's merchandise imports, which ticked up to 14.6 percent in 2012. The rise in energy imports more than offset the rise in vertical integration of ASEAN component imports. Malaysia and Indonesia accounted for 3.7 percent and 3.6 percent, respectively, in 2012. South Korea, not an ASEAN member, was sixth with 4.6 percent.

Energy, principally petroleum, has been the top merchandise import category for decades. Such products accounted for 22.8 percent of Japanese imports in 1992, rising to 34.1 percent in 2012. Japan has grown increasingly dependent on OPEC nations as Indonesia's production has diminished (see Table 4, Japan's merchandise imports by product). Consequently, the country is more exposed to potential supply disruptions from the Middle East than any other advanced economy, as well as price spikes. Electrical and electronic equipment imports have witnessed a significant increase since 1992—rising from 5.5 percent of the total to 10.9 percent in 2012. Much of that is attributable to the assembly of Japanese components in China and ASEAN countries, which are imported back to Japan as finished products. Additionally, foreign firms have made market share inroads in Japan.

**Table 4 | Japan's merchandise imports by product**

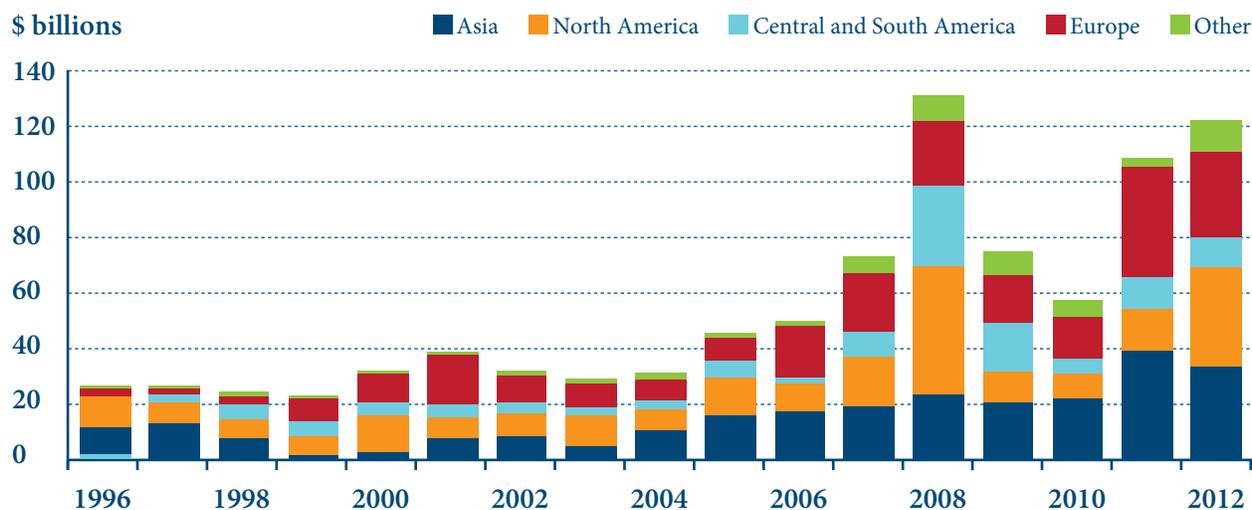
	1992	2002	2012
Mineral fuels, oils, distillation products, etc.	22.8%	19.5%	34.1%
Electrical, electronic equipment	5.5%	12.6%	10.9%
Machinery, nuclear reactors, boilers, etc.	6.3%	11.0%	7.2%
Ores, slag and ash	2.9%	1.9%	4.0%
Optical, photo, technical, medical, etc. apparatus	2.2%	3.9%	3.0%
Pharmaceutical products	1.2%	1.4%	2.6%
Vehicles other than railway, tramway	2.9%	3.0%	2.4%
Organic chemicals	2.3%	2.4%	2.1%
Articles of apparel, accessories, not knit or crochet	2.5%	2.1%	1.8%
Plastics and articles thereof	1.1%	1.6%	1.8%

Sources: International Trade Centre, UN Comtrade.

Machinery is the third-largest import category, representing 7.2 percent in 2012, up marginally from 1992 but down from 11 percent as recently as 2002. The absolute level of machinery imports doubled between 2002 and 2012, but the surge in petroleum imports caused its share to decline. Ores and other materials were fourth in 2012, at 4 percent. Optical, photographic, technical, medical, and other apparatus was fifth, followed by pharmaceutical products, vehicles, organic chemicals, apparel, and plastics. The top 10 merchandise import segments represented 70 percent of Japan's total in 2012.

Japan's outward FDI is a driver of the changing trade relationships within Asia and around the world. As previously noted, some of Japanese firms' overseas manufacturing capacity was created to avoid trade protection. However, the bulk of the most recent expansion in outward FDI has been due to the loss of domestic price competitiveness from previous yen appreciation and higher wages.

**Figure 15 | Japan's outbound FDI by region**



Sources: JETRO, Japan Ministry of Finance, BOJ.

As Figure 15 displays, Japanese FDI rose from the equivalent of \$24 billion in 1996 to a pre-financial crisis peak of \$127 billion in 2008. As global trade contracted during the Great Recession, Japan cut its outward FDI in half by 2010. As mentioned, China has been the destination for the greatest increase in Japan's outward FDI in recent years. Table 5 depicts cumulative Japanese FDI in China by major category. Machinery and transport equipment represent the bulk of the investments. However, North America accounted for the largest share of Japanese FDI in 2008 and saw the most severe pullback during the Great Recession, while Asia stayed fairly constant. In 2011 and 2012, Japanese FDI to North America and Europe rebounded, and Japanese FDI expanded overall. Indeed, the second-highest outward FDI total in Japanese history was recorded in 2012, rising 12.5 percent from 2011. Japan's outward FDI stock exceeded \$1 trillion in 2012. Additionally, ASEAN nations received slightly more FDI from Japan in 2012 than China.<sup>25</sup>

**Table 5 | Japan's cumulative direct investment in China (billion yen)**

	1992	2000	2008
Food and live animals	16	100	242
Crude materials, inedible, except fuels	35	225	407
Mineral fuels, lubricants and related materials	-	-	44
Chemicals and related products, nes	13	106	409
Manufactured goods classified chiefly by material	12	130	489
Machinery and transport equipment	109	762	2,625

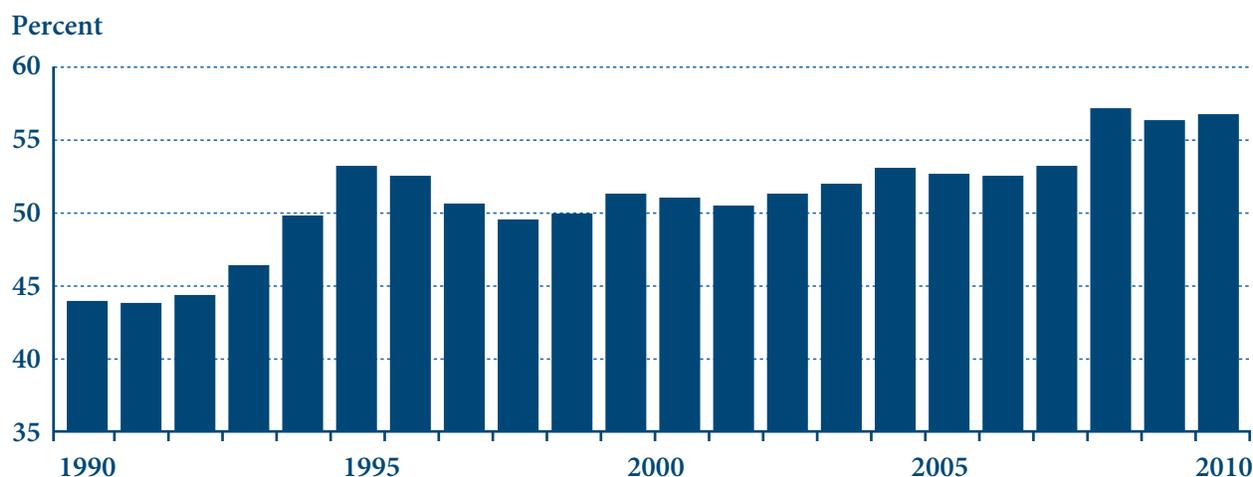
Sources: Ministry of Finance, Bank of Japan, Lim and Khun.

25. "JETRO Global Trade and Investment Report: Revitalizing Japan Through Global Business," 2013, p. 4.

The share of high-technology products among Japan's exports has fallen. Some of this is due to the decline of computer and office equipment exports as intermediate components were shipped abroad for final assembly. Japanese firms established these production operations in Asia but retained research and development investments at their headquarters in Japan.<sup>26</sup> R&D expenditures, for their part, have been increasing since the mid-1990s in Japan. In relation to GDP, Japan's R&D spending is among the highest in the world. For major economies, including the U.S., it is the highest.

Although Japan's weight in global trade flows has waned in recent years, it continues to be a hub for intraregional trade in Asia. Japanese exports accounted for nearly 60 percent of the intraregional aggregate in 2010, predominantly in machinery, chemicals and transport equipment. Japan's exports are shifting to high-value-added sophisticated intermediate inputs. It claims a large share of exports in automotive components and sophisticated semiconductors, not just for Asia but the U.S. and Western Europe. As displayed in Figure 16, intermediate goods' share of total Japanese exports rose from 44 percent in 1990 to 57 percent in 2011.

**Figure 16 | Japan's intermediate goods as share of total exports**



Sources: OECD STAN Bilateral Trade database, Milken Institute.

Vertical specialization has risen throughout Asia, with Japan the linchpin.<sup>27</sup> The country provides a high degree of the foreign value added (FVA) in gross exports of other Asian nations. A significant percentage of the FVA for Hong Kong and Chinese electronics equipment originates in Japan, as well as motor vehicles for Thailand and Taiwan. The FDI flows throughout Asia, much of it from Japan and increasingly from China, have propelled the region's economic growth. However, there may be limits to the speed of further integration stemming from geopolitical and financial friction between China and Japan. China wants the renminbi (RMB) currency to play a larger role in settling cross-border trade in Asia and around the world but territorial disputes over islands may hinder FDI expansion and trade integration within the region.<sup>28</sup> Figure 17 highlights the top 10 intermediate products in Japanese exports and imports for 2009. For both directions of trade, monolithic integrated circuits, commonly known as semiconductors, was the largest category.<sup>29</sup>

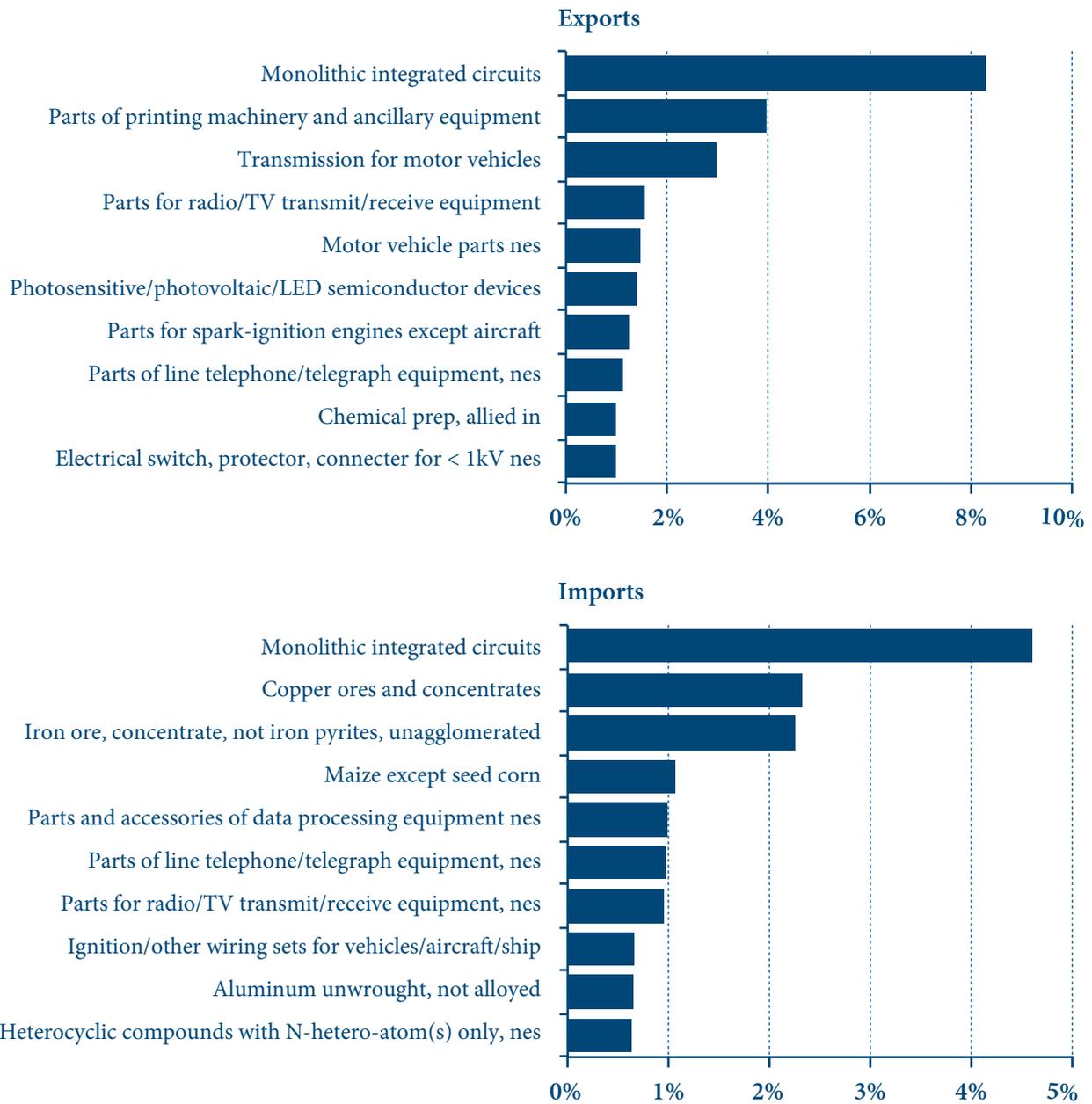
26. Tamim Bayoumi, "Changing Patterns of Global Trade," International Monetary Fund, June 15, 2011, pp. 23-24.

27. Perry Wong, Tong Li, and Song-yi Kim, "Evolving Patterns of Trade in Asia," Milken Institute, April 2013, pp. 3-4.

28. Barry Eichengreen and Bokyeong Park, *The World Economy After the Global Crisis: A New Economic Order for the 21st Century* (Singapore, World Scientific Publishing Co. Pte. Ltd., 2012), pp. 153-171.

29. Hubert Escaith and Satoshi Inomata, "Trade Patterns and Global Value Chains in East Asia: From Trade in Goods to Trade in Tasks," WTO and IDE-JETRO, 2011, pp. 89-90.

**Figure 17 | Japan's trade in intermediate goods (2009)**



Sources: OECD, UN Comtrade Database, IDE-JETRO, WTO.

# Services

Global trade in services has been increasing faster than that of merchandise in recent decades. Japan's experience is consistent with that pattern, but services haven't been as important to the nation's trade as merchandise. Since 1990, global growth of services trade has averaged 8.1 percent. Several factors are responsible for the trend. Services output as a share of global GDP has risen from 55.7 percent in 1980 to 70.2 percent in 2011. Additionally, rapid technological advances, and the attendant decline in prices, have increased the demand for telecommunications services and caused overall demand to grow swiftly. Liberalization of the trade in services has played a role as well. Most advanced nations are net exporters of services due to intellectual property being a larger proportion of their economies compared with developing nations. Japan, however, is an outlier, running a trade deficit in services.

It is important to understand the nature of this trade and how services are delivered. The first means is a cross-border transaction with suppliers and consumers remaining in their respective countries. In this case, an insurance firm might deliver services electronically via the Internet. Consumers can traverse a border to purchase services such as a hotel stay or visit to a theme park. The third way is by establishing a commercial presence in another country. For example, a foreign bank might deliver services in Japan from a subsidiary based there. Lastly, foreign citizens might relocate to another country to provide individual services such as engineering.<sup>30</sup>

As in merchandise exports, the rise of China as a services market is the lead story. These exports tend to follow the movement of FDI as R&D activities, accounting, and other business services are supplied by the investing countries. Consequently, Japan's service exports to China witnessed significant growth over the last decade. As recently as 2001, China accounted for just 3.6 percent of Japan's service exports, as highlighted in Table 6. By 2011, China's share had jumped to 8.7 percent, ranking it third overall. Similarly, Singapore's share of Japan's service exports almost doubled over the decade, rising from 5.5 percent in 2001 to 10.2 percent in 2011, a fast climb.

**Table 6 | Japan's service exports by country**

	2001	2011
United States	31.9%	24.1%
Singapore	5.5%	10.2%
China	3.6%	8.7%
United Kingdom	7.7%	7.5%
Germany	3.4%	5.3%
Netherlands	3.6%	3.8%
Hong Kong	5.2%	2.5%
S. Korea	5.0%	2.4%
Indonesia	1.6%	2.3%
Thailand	2.8%	2.1%

Source: UN Service Trade Statistics Database.

30. Shintaro Hamanaka, "Cross-Regional Comparison of Trade Integration: The Case of Services," Asian Development Bank, No. 108, March 2013, pp. 7-8.

The U.S. remained Japan's largest market for services in 2011, though falling to 24.1 percent from 31.9 percent in 2001. Most of the drop in share was due to remarkable gains by China and Singapore. American tourists still see Japan as an important destination. Germany has received a growing proportion of Japan's service exports too, rising from 3.4 percent in 2001 to 5.3 percent in 2011. Other ASEAN nations such as Indonesia have also seen their shares expand.

Japan recorded a decline in the share of transportation services over the recent decade, which fell from 36.5 percent in 2002 to 28 percent in 2012. This was mostly due to the rise in various types of business services. Royalties and license fees jumped from 15.9 percent to 22.4 percent of total service exports between 2002 and 2012, consistent with patterns of outbound Japanese FDI. Another category that saw a gain was travel services, climbing from 5.3 percent in 2002 to 10.2 percent in 2012. Rising incomes in China and other Asian nations enabled more tourists to visit Japan. However, unlike the experience of most advanced nations, the shares of Japan's communication, computer and information, and financial services exports fell, as displayed in Table 7.

**Table 7 | Japan's service exports by category**

	2002	2012
Transportation	36.5%	28.0%
Other business	26.5%	26.4%
Royalties and license fees	15.9%	22.4%
Travel	5.3%	10.2%
Construction	7.0%	8.1%
Financial	4.8%	3.3%
Government	1.2%	2.2%
Computer and information	1.7%	1.0%
Communication	1.1%	0.7%
Personal, cultural, and recreational	0.5%	0.1%
Insurance	-0.5%	-0.3%

Source: WTO.

The U.S. remains the largest source of Japan's service imports. It provided 30.3 percent in 2011, down slightly from 32.9 percent in 2001. This strength is somewhat surprising given that Japanese tourism declined substantially, but that was partially offset by gains in business services and royalty and license imports. China saw an increase in its share of Japan's service imports, reaching 5.8 percent in 2011 and second place overall after the U.S., Germany, and Singapore made slight gains in their share of Japan's service imports as well. UK and Hong Kong shares declined (see Table 8).

**Table 8 | Japan's service imports by country**

	2001	2011
United States	32.9%	30.3%
China	3.6%	5.8%
United Kingdom	7.1%	5.6%
Singapore	4.2%	5.5%
S. Korea	4.9%	4.8%
Germany	3.2%	3.6%
Hong Kong	4.4%	3.4%
Netherlands	2.0%	2.7%
Thailand	3.6%	2.0%
France	2.6%	1.9%

Source: UN Service Trade Statistics Database.

As Japan's merchandise trade balance deteriorated over the last decade, transportation service imports rose as well. Transportation services was the largest category in 2012, representing 31.6 percent of Japan's service imports. Travel services fell from 25 percent in 2002 to 15.9 percent in 2012 as Japanese tourists remained home more often amid falling nominal wages. Other business services witnessed an increase to 26.6 percent of Japan's total in 2012. Other service export categories expanding share include royalties and license fees, construction, insurance services and computer and information services as highlighted in Table 9. Overall, Japan's share of intra-Asian service exports fell more than 30 percent between 2000 and 2010, and it fell out of first place in the process.<sup>31</sup>

**Table 9 | Japan's service imports by category**

	2002	2012
Transportation	28.2%	31.6%
Other business	23.3%	26.6%
Travel	25.0%	15.9%
Royalties and license fees	10.4%	11.4%
Construction	3.4%	4.4%
Insurance	3.0%	4.2%
Computer and information	2.0%	2.6%
Financial	1.5%	1.8%
Government	1.3%	1.1%
Personal, cultural, and recreational	1.1%	0.7%
Communication	0.9%	0.7%

Source: WTO.

31. International Trade: Statistical Yearbook for Asia and the Pacific 2011, UN/DESA, 2012, <http://www.unescap.org/stat/data/syb2011/III-economy/international-trade.asp> accessed March 19, 2014.

# Portfolio Investment

Japan has long been a net exporter of portfolio investment. Purchases of foreign equities and debt, including sovereign debt (principally U.S. Treasuries), local debt instruments, and private-sector bonds, are the main categories. In 2011, Japan's outbound portfolio investment exceeded the inbound total by \$1.35 trillion, a gap of 40 percent.

The U.S. remains the largest destination for Japan's outbound portfolio investment with just a minor share reduction in recent years—from 35.8 percent in 2002 to 33.6 percent in 2012. Many Japanese invest in hedge funds and other financial services in the Cayman Islands, the second-largest destination recently, with 16.3 percent. The UK is tied with France for third rank at 6.1 percent, decreasing slightly over the decade. Germany, Australia, the Netherlands, and Luxembourg follow (see Table 10).

**Table 10 | Japan's outbound portfolio investment assets by country**

	2002	2012
United States	35.8%	33.6%
Cayman Islands	12.6%	16.3%
France	4.8%	6.1%
United Kingdom	6.8%	6.1%
Germany	8.7%	5.1%
Australia	1.6%	4.7%
Netherlands	3.0%	3.6%
Luxembourg	4.0%	2.6%
Canada	1.6%	1.7%
Italy	3.2%	1.5%

Source: IMF Coordinated Portfolio Investment Survey.

The Japanese held the preponderance of their outbound portfolio investment in debt securities at 80.5 percent in 2012, down from 84.9 percent in 2002. The bulk of those securities are long term. Japanese investors increased their foreign holdings of equities to 19.5 percent of outbound liabilities in 2012, up from 15.1 percent in 2002 as shown in Table 11. In contrast, foreign holdings of portfolio investment in Japan are allocated more equally between equities and debt instruments. In 2002, foreign equity holdings accounted for 55.7 percent of inbound portfolio investment in Japan. The equity share fell to 46.3 percent in 2012 as Japan's stock markets retrenched. Foreign holdings of Japanese debt were split almost equally between long and short term, 27.4 percent and 26.3 percent, respectively.

**Table 11 | Japan's portfolio investment by type**

<b>Inbound liabilities</b>	<b>2002</b>	<b>2012</b>
Debt securities	44.3%	53.7%
Long-term debt	38.0%	27.4%
Short-term debt	6.3%	26.3%
Equities	55.7%	46.3%
<b>Outbound liabilities</b>	<b>2002</b>	<b>2012</b>
Debt securities	84.9%	80.5%
Long-term debt	81.4%	79.8%
Short-term debt	3.5%	0.7%
Equities	15.1%	19.5%

Source: IMF Coordinated Portfolio Investment Survey.

The sources of Japan's inbound portfolio investment have seen significant alterations since 2002. First, the UK has moved from the top source at 32.4 percent in 2002 to third at 12.8 percent (see Table 12). This capital has found other homes. China has become a large portfolio investor in Japan. Its share rose from just 1.2 percent in 2002 to 13.7 percent overall in 2012, lifting it to second position. The U.S. was first in 2012 at 25.3 percent, a decline from 2002. Continental Europe accounted for 20.6 percent of Japan's inbound portfolio investment in 2012. One of Abenomics' goals is to attract more inbound portfolio investment, providing more sources of funds and, hopefully, encouraging more domestic economic activity.

**Table 12 | Japan's inbound portfolio investment liabilities by country**

	<b>2002</b>	<b>2012</b>
United States	29.5%	25.3%
China	1.2%	13.7%
United Kingdom	32.4%	12.8%
Luxembourg	3.1%	6.6%
France	2.3%	5.2%
Belgium	1.4%	3.7%
Switzerland	2.5%	3.5%
Singapore	3.1%	3.1%
Cayman Islands	1.6%	2.7%
Canada	1.0%	2.5%

Source: IMF Coordinated Portfolio Investment Survey.



# The Sensitivity of Japan's Exports and Imports to the Value of the Yen

**A**s previously discussed, the degree to which Japanese trade responds to the depreciation of the yen will have a material impact on the success of Abenomics. It is useful to examine the historical reactions of Japan's trade flows to exchange rate fluctuations to shed light on future movement. Is that relationship changing? This gives us some empirical basis for prediction. For example, have Japan's exports been less sensitive to the most recent period of depreciation than to similar trends in the more distant past?

Although numerous factors affect trade among nations, the primary sources of variation are foreign and domestic income and prices. Changes in Japan's exports are heavily influenced by movements in their price (including the exchange rate of the yen), adjusted for quality, relative to that of goods or services available in the destination market, along with foreign incomes and business output.<sup>32</sup> An important exception would be a scenario in which domestic and foreign tradeables have low elasticity of substitution. Monopoly power would give domestic and foreign firms more freedom to set prices in their own and foreign markets. There appears to be some evidence of this in Japan's case, but it is very limited.<sup>33</sup> The prices of Japan's exports relative to those of alternative goods and services available domestically in the nations it trades with, adjusted by the trade-weighted value of the yen, must be included in the specification. Foreign real GDP or a weighted matrix of Japan's trading partners' demand for imports affect Japan's exports, while its demand for imports depends on domestic final sales and prices of imports from trading partners in yen terms.

The movements of goods and, to a lesser extent, services don't instantaneously respond to price fluctuations. There is a gradual adjustment over time, often called a lag, as market participants react to a chain of signals affecting their decisions. Domestic and foreign firms may not alter prices in foreign currency terms initially, waiting to determine whether the adjustment in the exchange rate is transitory or longer-lasting (price lag). Even when prices are adjusted, purchasing managers and agents don't at first recognize the new prices (recognition lag). Next, once they are aware of the price change, orders must be placed based on the new information (ordering lag). The goods must be produced (production lag), shipped, and delivered (delivery lag).<sup>34</sup>

Longer-term decisions are involved as well. Domestic and foreign multinational firms must determine whether and where to place new capital investments. Expected profitability or return on investment (ROI) would be the primary consideration, both absolute (whether the rate of return exceeds the cost of capital) and relative (is the ROI better than what may be offered by an alternative project?).<sup>35</sup>

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32. Charles L. Schultze, *Memos to the President: A Guide Through Macroeconomics for the Busy Policy Maker* (Washington, D.C., The Brookings Institution, 1992), p. 96-106.

33. Michael Wickens, *Macroeconomic Theory, A Dynamic General Equilibrium Approach* (Princeton, N.J., Princeton University Press, 2011), pp. 153-184.

34. William R. Cline, *United States External Adjustment and the World Economy* (Washington, D.C., Institute for International Economics, 1989), pp. 4-5.

35. Ross C. DeVol and Perry Wong, "Jobs for America: Investments and Policies for Economic Growth and Competitiveness," Milken Institute, January 2010, pp. 13-16.

A number of location factors impact these choices, with currency valuation among them.<sup>36</sup> Capacity can be expanded by adding equipment to existing facilities and new fixed investment in plant. The latter is a much longer procedure.

In Japan's case, multinationals headquartered there as well as foreign ones will need to evaluate whether the yen's depreciation is permanent and sufficient to induce them to shift their investment in new capacity to Japan from their home countries or third-country locations. For example, Sony or Panasonic must decide whether to expand their advanced electronics production in Japan, China, or Malaysia. Nissan needs to determine whether the value of the yen warrants adding capacity in Japan at the expense of an ASEAN nation. This process can easily require three years of evaluation.

## Estimation of Historical Relationships

We examined total real exports and imports for Japan, using quarterly data from 1983:1 to 2012:4, to determine the historical relationships between their movement and changes in the value of the trade-weighted yen, controlling for factors such as income and final demand. The quarterly data allow us to discern the high-frequency temporal dynamics of how Japan's merchandise trade responds to fluctuations in the yen. We next used annual data, permitting us to explore the relative sensitivity of Japan's exports and imports by product category. For example, are Japan's auto exports more sensitive to a depreciation of the yen than is machinery? Detailed industry data sufficient to estimate historical relationships were available only on an annual basis.

Econometric equations explaining quarterly movements in Japan's merchandise exports and imports were estimated based on the value of the yen, an income or final sales measure, and other control factors. A double-log functional form was deployed, causing the coefficients to be elasticities (marginal sensitivities). For the income measure and yen value, polynomial distributed lags were incorporated to allow for a gradual adjustment of trade flows with respect to movements in these variables. An optimal searching technique was deployed, which demonstrated that a second-degree polynomial best fit the historical data. A second-degree polynomial has increasing weights on the lagged values until a peak value is reached, when they begin to asymptotically approach zero. Near- and far-tail restrictions were imposed on the polynomials, which avoids coefficients switching signs and places a symmetrical pattern on the coefficients over time. A goal-searching technique was deployed to evaluate the optimal lag length for changes in past values of the yen and income and their impact on Japan's trade flows. Autocorrelation was corrected by the use of the Cochrane-Orcutt first-order autoregressive error correction, if found.

### Results Quarterly:

Table 13 displays a sample equation result. The equation is for Japanese real merchandise exports (JapanExp\_Index). The first explanatory variable is Japan's weighted matrix of trading partners' import demand (JapanPartnerTWIndex). This is similar to a foreign income variable but is a more precise measure of the demand for the types of products Japan exports. It's entered with a four-quarter lag structure. The relationship is strong, with significance at the 0.1 percent level. The sum of the lagged coefficients is 0.69. This elasticity implies that as foreign demand for the types of products Japan exports rises 10 percent, Japanese exports increase 6.9 percent. This is a fairly low income elasticity of demand. It has a mean lag (maximum single quarterly impact) of two quarters.

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36. Surjit S. Bhalla, *Devaluing to Prosperity: Misaligned Currencies and Their Growth Consequences* (Washington, D.C., Peterson Institute for International Economics, 2012) pp. 67-77.

**Table 13 | Japan's real merchandise exports**

Explanatory variable	Dependent variable: log(JapanExp_Index)	
log(JapanPartnerTWIndex)	Coefficient	0.693***
	t-value	3.1
	p-value	0.002
log(JapanTWREX_Real)	Coefficient	-0.362*
	t-value	-1.8
	p-value	0.069
	R <sup>2</sup>	0.95
	R2 adjusted	0.95
	F	480.9***
	Observations	127
	D.W.	1.83

Source: Milken Institute.

**Variable description:**

where JapanExp\_Index equals a real index of Japanese exports (IMF)

where JapanPartnerTWIndex equals a weighted index of external demand for Japan's exports (Oxford Economics)

where JapanTWREX\_Real equals Japan's trade weighted real exchange rate (JP Morgan)

**Other functions/notes:**

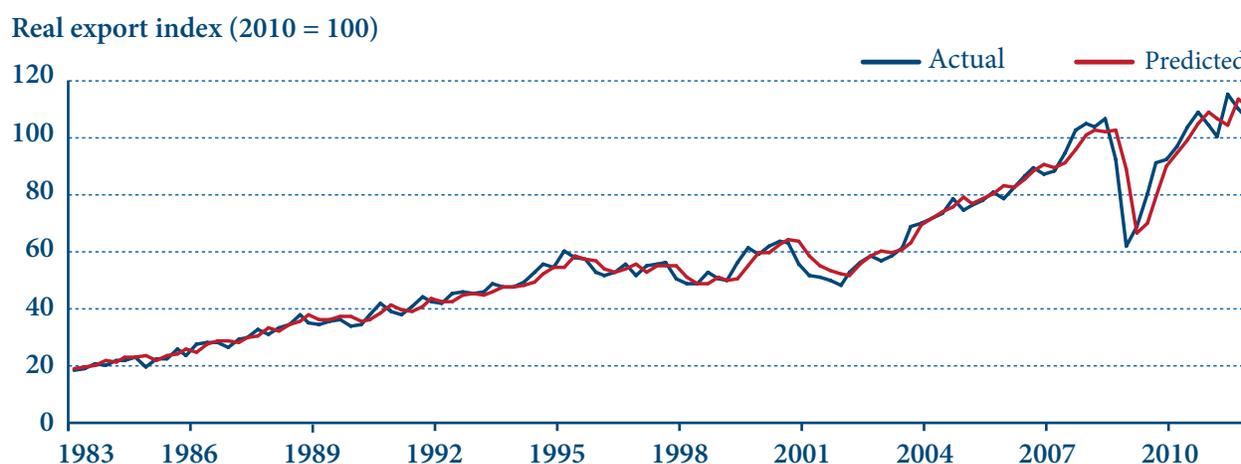
\*\*\* Significant at 1% level

\* Significant at 10% level

Log returns the natural logarithm of (X), using a base of 2.71

The second variable is the real trade-weighted value of the yen (JapanTWREX\_Real). The yen's value was entered as a 12-quarter lag, reflecting the gradual adjustment of exports to movements in the exchange rate. It had a mean lag of six quarters. The estimated coefficient was -0.36, implying that a 10 percent sustained decrease in the value of the yen results in a 3.6 percent increase in Japan's merchandise exports. This level of elasticity is at the low end of the 0.3 to 0.6 range that is typically found with respect to exports. This variable was significant at the 10 percent level. Two time trends were entered into the specification. The overall explanatory power of the relationship is strong. More than 95 percent of the quarterly change in Japan's merchandise exports could be explained by the equation. Figure 18 illustrates how close the fitted values from the equation explain actual movements.

**Figure 18 | Japan's actual exports vs. predicted values from equation**



Source: Milken Institute.

The equation for Japan's merchandise imports (JPimports\_Index) was estimated in a specification similar to that of exports. The first explanatory variable is an index of Japan's real GDP (JapanGDP). The variable was entered into the specification with a four-quarter lag. The variable is significant at 0.1 percent level—a high degree of significance. The long-term elasticity is 1.6, implying that a sustained increase of 10 percent in Japan's GDP leads to a 16 percent increase in real imports. Some of this relatively high elasticity stems from the need to import virtually all petroleum for consumption. The second explanatory variable, the real trade-weighted value of the yen (JapanTWREX\_Real), was significant at the 5.0 percent level. It was entered with a 12-quarter lag structure. The long-term elasticity was 0.28, meaning that a 10 percent depreciation of the yen leads to a 2.8 percent decrease in merchandise imports. The overall explanatory power of the equation was strong. It explained almost 99 percent of the quarterly movement of Japan's imports.

## Results Annually:

To determine whether specific products respond differently to the value of the yen, we investigated annual data on real exports and imports by product type. Five merchandise categories (electrical, iron, machinery, optical, and vehicles) and total services were used. Japan's weighted matrix of trading partners' import demand was highly significant in all the merchandise product categories and in service exports. The elasticity of exports with respect to foreign demand ranged from a low of 0.78 for vehicles to a high of 1.9 for electrical equipment.

The value of the yen had the correct sign in all but one merchandise product category (optical) but was significant only in the vehicle export equation (see Table 14). For vehicles, the elasticity of exports with respect to the yen was a high 0.97. Further, it took four years before the change in the currency fully fed into exports of vehicles. This is the main source of the overall sensitivity of Japan's merchandise exports to the value of the yen. For example, this is consistent with Thorbecke's finding that chemical exports had an elasticity of zero while it was 0.66 for vehicles.<sup>37</sup> In the case of service exports, the foreign demand elasticity was 1.23 and was significant at the 5 percent level. The value of the yen was significant at the 10 percent level and had a high elasticity of 0.97. The overall explanatory power of these relationships was strong and robust.

**Table 14 | Japan's estimated price (yen) and income elasticities**

	Relative price elasticity	Income elasticity
<b>Exports</b>		
Electrical	-0.42	1.90 ***
Iron	-0.70	1.76 ***
Machinery	-0.02	1.76 ***
Optical	0.49	1.42 **
Vehicles	-0.97 ***	0.78 **
Services	-0.97 *	1.23 ***

37. Willem Thorbecke, "The Contribution of the Yen Appreciation Since 2007 to the Japanese Economic Debacle," Centre d'Etudes Prospectives et d'Informations Internationales, November 2012, pp. 7-8.

**Table 14 | Japan's estimated price (yen) and income elasticities (continued)**

	Relative price elasticity	Income elasticity
<b>Imports</b>		
Electrical	1.53 **	4.00 ***
Mineral	-0.07	8.09 ***
Machinery	1.37 **	4.23 ***
Optical	1.05 **	3.57 ***
Ores	-0.58	6.79 ***
Services	-0.42	1.64 *

Source: Milken Institute.

\*\*\* Significant at 1% level

\*\* Significant at 5% level

\* Significant at 10% level

For merchandise imports by product (electrical, mineral, machinery, optical, and ores) Japan's real GDP was significant in all equations. Income elasticities were very high, ranging from 3.6 for optical to 8.1 for minerals (mostly petroleum). This reflects the fact that any economic growth in Japan translates into higher fossil fuel imports, especially since the Fukushima nuclear disaster. The value of the yen had the correct sign in three of the five import product categories, and was significant in all three—electrical, machinery, and optical. Elasticity was highest for electrical at 1.5 but was above 1.0 for the other two. Service imports were sensitive to Japanese GDP growth, but the yen was insignificant. Overall, the equations explain movements in Japanese imports very accurately.

## Has Japanese Trade Become Less Responsive to Yen Depreciation?

As highlighted earlier, there are reasons to suspect that Japan's exports are less sensitive to yen depreciation than they once were (though this does not apply to imports). Japanese multinationals have located substantial manufacturing capacity outside the country, potentially limiting exports' response to the value of the currency. One way to examine whether this relationship is changing is to compare data from the most recent period to a historical sample.

To have enough observations and attendant degrees of freedom, we used quarterly data for Japan's merchandise exports and imports. From the earlier quarterly regressions, the sample was split in half and estimated over the respective periods. We can compare the results and determine whether the elasticities substantially diverge.

When the relationship is evaluated from 1998 through 2012, the elasticity of exports with respect to the value of the yen declines to just 0.25, down from 0.43 when estimated between 1983 and 1997. Further, currency value displays minor significance in explaining Japan's merchandise exports in the latest period. Therefore, a 10 percent depreciation suggests that Japan's merchandise exports will rise by only 2.5 percent. The relationship between the yen and merchandise imports hasn't altered by nearly as much in recent years, suggesting that much of the economic stimulus must emanate from the substitution of domestically produced goods for foreign ones. The elasticity of imports with respect to the yen declined to 0.22 in the recent period, down from 0.31 from 1983 to 1996.

Other recent empirical analysis suggests that the depreciation of the yen may not stimulate Japan's economy because exports are less responsive than previously believed. Nagayasu found "no evidence to support the view that yen depreciation has facilitated economic growth."<sup>38</sup> Further, there was an absence of sustained causality from the exchange rate to Japan's output. Additionally, he found that another exchange rate model using manufacturing data was not more sensitive, which could come as a surprise since such data should be more responsive to the yen's value than GDP-based measures due to a higher proportion of firms being dependent on international trade.

Miyao also observes an insignificant relationship between the yen exchange rate and the trade balance since the 1980s.<sup>39</sup> In his view, this lack of causality seems to be linked to the non-sensitivity of exports to exchange rate depreciation. Nucci and Pozzolo help explain why Japan's exports are less responsive to the value of the yen.<sup>40</sup> They found that appreciation decreases investment by firms with high export ratios and increases investment by those with higher import ratios. This demonstrates that previous high levels of the yen have resulted in capacity being added abroad, but if the recent depreciation is sustained, capacity could expand in Japan.

Another study looks at the relationship between the value of the won and yen and how it affects their nations' trading patterns.<sup>41</sup> It finds that South Korean exports' response to a 10 percent depreciation of the won/yen exchange fell to 0.7 percent when estimated monthly from 2006 to 2013, compared to 1.5 percent over the 1998-2005 period. This implies that Japan's exports don't respond as vigorously to yen depreciation as they once did.

## Evidence on Japan's Trade Flows Since 2012

It has been 18 months since the yen began to depreciate; it is down by approximately 20 percent on a trade-weighted basis. On the surface, recent Japanese trade data don't appear to indicate that depreciation has boosted the economy meaningfully. The broadest measure, the current account balance, recorded a deficit in the first quarter of 2014 for the first time since the early 1980s. Compounding this was Japan's annual 2013 merchandise trade balance – at 2 percent, the largest as a percentage of GDP since the early 1960s. Drawing an inference from this is somewhat problematic, though, because one must control for many countervailing factors in determining whether Japan's trade flows are responding to the yen's recent slide.

First, one must examine what is happening to imports and exports separately. One countervailing force is the dramatic rise in Japan's energy imports. As displayed in Figure 19, they surged 14.3 percent in 2013 to compensate for the loss of nuclear-powered electrical generation. Natural gas and coal accounted for most of that increase. The non-fuel trade balance continues to be in surplus, though it narrowed slightly in 2013.<sup>42</sup> Overall import volumes in the first quarter of 2014 were up 8.4 percent from the same period a year earlier. Some of the strength was attributable to importers stocking up on consumer goods in anticipation of the sales tax increase on April 1, 2014.

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38. Jun Nagayasu, "Empirical Analysis of the Exchange Rate Channel in Japan," *Journal of International Money and Finance*, 2007, 26, pp. 887-904.

39. R. Miyao, "The Effects of Yen Depreciation Policy in Japan," *Economic Review*, 54 (2) 2003, pp. 114-125.

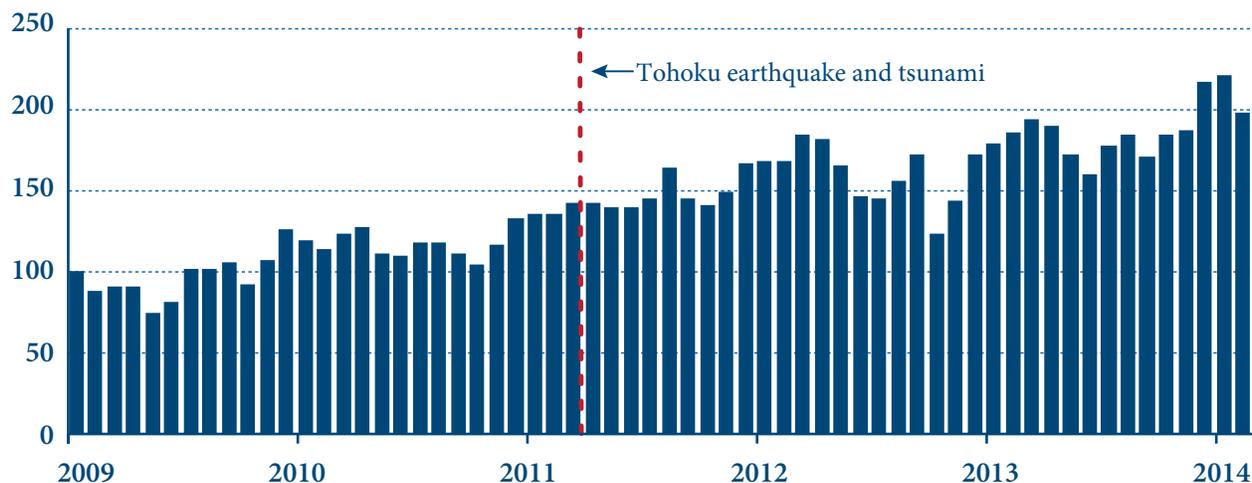
40. F. Nucci and A.F. Pozzolo, "Investment and the Exchange Rate: An Analysis with Firm-Level Data," *European Economic Review*, 2001, Vol. 45, No. 2, pp. 259-283.

41. Jack Joo K. Ree and Seoeun (Thelma) Choi, "Safe-Haven Korea? – Spillover Effects from UMPS," *International Monetary Fund Working Paper*, WP/14/53, April 2014, pp. 20-21.

42. Adam Slater, "What Is Happening to Japan's Trade Balance?" *Oxford Economics*, March, 2014, pp. 10-12.

## Figure 19 | Japan's energy imports

Index (Jan. 2009 = 100)



Sources: Datastream, Japan Ministry of Finance.

However, Japan's export performance has been discouraging as well. In the first three months of 2014, export volume ticked up 3.4 percent from the year earlier. Nevertheless, this shows some forward momentum after a slow response in early 2013. For the full year, Japan's exports rose a meager 1.6 percent.

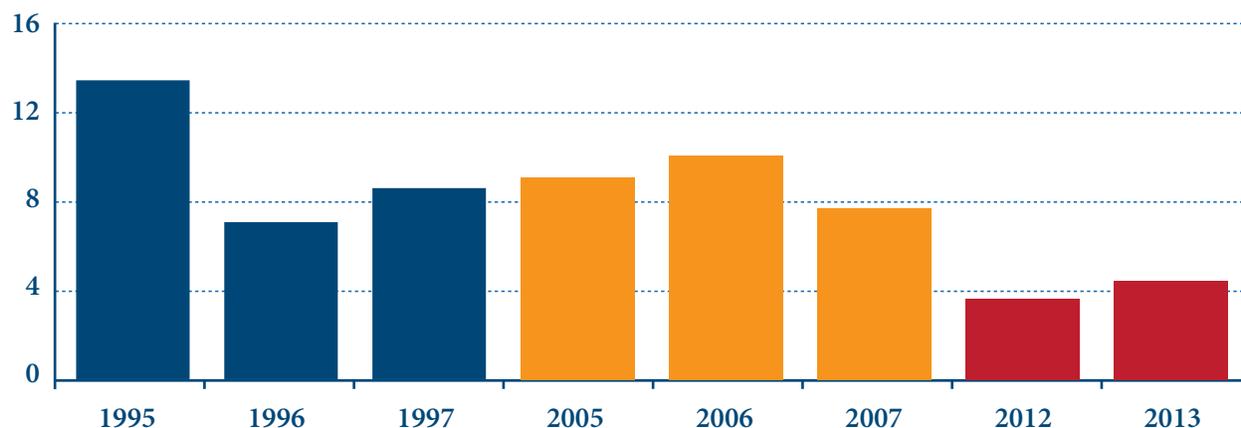
One often overlooked explanation for the weakness in manufactured product exports has been higher prices and curtailed supplies of electricity in the aftermath of the earthquake and Fukushima disaster. Electricity prices have climbed about 20 percent since, harming the competitiveness of Japan's electricity-intensive manufacturers. Power consumption relative to real GDP has fallen by nearly 15 percent since the earthquake.<sup>43</sup> Even if Japanese manufacturers could afford the higher prices, rolling blackouts were initiated, and effectively a rationing system was imposed. In this environment, Japanese firms were reluctant to bring production home, and foreign multinationals didn't build capacity in Japan, potentially harming exports.

The macroeconomic environment in recent years has been weaker than during past episodes of yen depreciation, and the demand for Japan's exports has been softer. World trade, weighted by Japan's export shares based on the Oxford Economics Global Macro Model, shows growth of just 4 percent annually in 2012 and 2013. In contrast, from 1995 to 1997 (displayed in Figure 20), a period of similar yen depreciation, Japan's trade-weighted export demand rose an average of 10 percent. Further, in the 2005-2007 period, when the yen depreciated again, Japan's trade-weighted export demand increased 9 percent on average. This suggests that much of Japan's export weakness can be attributed to reduced regional and global trade in 2013.

43. Mark Williams and Julian Jessop, "Japan Economics Weekly: The Fallout from Fukushima," Capital Economics, November 11, 2013.

**Figure 20 | Japan's trade-weighted export demand during yen depreciation**

Percent growth of export markets



Source: Oxford Economics.

A contributing factor in Japan's poor export performance in 2013 was the protracted effect of the Chinese boycott against Japanese goods linked to Abe's visit to the controversial Yasukuni shrine to pay respect to Japan's war dead. China, South Korea, and other Asian nations see such an action as honoring war criminals. The dispute over the Senkaku islands (which China refers to as the Diaoyu islands) in the East China Sea is another. Japan's exports to China fell 2.9 percent in 2013, substantially underperforming Hong Kong, Taiwan, and South Korea. Sales of Japanese-branded consumer products shrank the most—the reported market share of Japanese vehicles fell to just 8 percent in October 2013, down from 20 percent in October 2012.<sup>44</sup> However, Japan's exports to China have accelerated in recent months and are running about 10 percent above the same period a year ago, suggesting that lower prices have persuaded Chinese consumers and businesses to buy.

Some evidence points to the role of Japan's large outbound FDI in its lagging export growth. The weakest export categories in 2013 were those whose overseas capacity had expanded by the largest percentage. Japan's exports of electrical equipment, general machinery, and transportation equipment declined in 2013 while overall exports rose moderately. Combined, these categories represent slightly less than half of Japan's recent FDI. Further, more FDI seems oriented toward securing lower-cost energy supplies. Countries that provide the largest proportion of Japan's energy imports have seen their share of Japanese FDI rise from 8 percent in 2005 to 2010 to 12 percent since.

Nevertheless, as our econometric work demonstrates, there is a long lag between changes in the value of the yen and its ultimate impact on trade flows, investment, and economic performance. In other words, we shouldn't have expected exports to respond instantly to depreciation. Recent data suggest that Japan's export volume is accelerating. Further, in January, Japan's industrial production rose 10.4 percent from a year earlier. The nation's export machine appears to be on the cusp of recovery.

There is positive news stemming from Japan's trade relationship with South Korea. The won appreciated 23 percent against the yen in 2013, and South Korea's exports to Japan declined 10 percent in U.S. dollar terms. On the other hand, Japan's exports to South Korea dropped nearly 11 percent.<sup>45</sup> South Korea's finance minister has cautioned Japan against overreliance on yen depreciation to solve its economic problems, saying the third arrow—structural reforms—must drive progress toward that objective.

44. Marcel Thieliand, "Japan Economics Update: How Disruptive Are Tensions with China?" Capital Economics, November 27, 2013.

45. Clare Howarth, "Korea and Japan: A Competitive Tale, but Which One Is the Loser?" Oxford Economics, Research Briefing, April 2014.



# Abenomics and the Future

**T**he first two arrows of Abenomics—aggressive monetary policy with inflation targeting and further fiscal stimulus—are well underway. A few of the third-arrow structural reforms are being implemented, but they are not extremely bold nor likely to prove very productive. Using a systematic quantitative modeling approach, we can evaluate the probable effectiveness of each arrow and the joint impact of all three.

To perform this analysis, a macroeconomic modeling system incorporating Japan’s global links with major trading partners, portfolio flows, and FDI patterns is required to evaluate the full dynamic properties and feedback effects among national economies.

## Alternative Future Economic Simulations

To evaluate Japan’s overall economic performance, we enlisted a dynamic macroeconomic equilibrium growth model. This allows us to produce alternative estimates of the resulting changes in trade flows, international capital flows, business investment, industrial production, employment, labor force participation, wages and incomes, consumption, multifactor productivity growth, and real GDP gains attributable to the various elements of Abenomics. We can quantify these changes by comparing a baseline economic projection to an alternative simulation in which the policies are implemented.

In growth models such as the Oxford Economics Global Macro Model used in this analysis,<sup>46</sup> the expansion rate of technical progress, the deployed human capital, and the physical capital stock determine the productive potential of the economy. Both technical progress and capital stock are governed by investment, which in turn must be in balance with post-tax capital costs, available savings, and the capacity requirements of current spending. The capacity to supply goods and services is tied to the basic inputs of labor hours, energy use, business equipment and structures, and government infrastructure. The “total factor productivity” of this composite of tangible inputs is driven by expenditures on research and development that spur technological progress.

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46. The Oxford Economics Global Macro Model was used to perform these alternative policy simulations. It has evolved over 30 years in response to changing structural relationships in the macroeconomic environment.

# A Trade-Linked Macro-Model

Oxford Economics' modeling principles recognize that many of the most important and interdependent macroeconomic issues are inherently international. Globalization means that policymakers and analysts must form judgments about developments in their domestic economy as well as the economies of countries with which they have trade and financial ties. A single-country econometric model, which treats world trade, world prices, and exchange rates as exogenous, is simply incapable of analyzing some of the issues most relevant to financial and business transactions.

The unifying feature of this integration is the advances in trade and capital flows since World War II. The model comprises 46 countries and six regional blocs linked by trade, prices, exchange rates, and interest rates. The regional blocs comprise Africa, Latin America, Eastern Europe, OPEC, Rest of OECD, and Rest of World. These blocs implicitly model 150 or so additional countries to obtain complete world coverage.

Through this system, a detailed, almost self-contained, Japan macro-model is fully integrated with its major trading partners and financial centers around the world. Japan's trade flows are disaggregated into fuel, non-fuel goods, and services. The non-fuel goods components reflect the bulk of exports and imports for most countries.

Total exports and imports are determined by demand for exports of non-fuel goods; the equivalent imports; world trade; total final expenditure; relative unit labor costs; and capacity utilization as measured by model estimates of the output gap. Time trends capture secular shifts in Japan's world trade share caused by non-price factors and the impact of the long-term specialization of production on import penetration. The Japanese model satisfies the Marshall-Lerner conditions, so that a sustained improvement in competitiveness will lead to trade balance improvement in the long run.

The equations for trade in services are analogous to those for non-fuel goods, while imports of fuel meet the gap between domestic and export demand on one side and domestic production on the other. All trade prices are a weighted average of domestic and world prices.

The Oxford Global Economic Model links Japan with other individual countries in a number of ways, summarized below:

- » Trade (exports driven by weighted matrix of trading partners' import demand)
- » Competitiveness (IMF relative unit labor costs where available, relative prices elsewhere)
- » Interest rates and exchange rates
- » Commodity prices (e.g., oil, gas, and coal prices depend on supply/demand balance; metal prices depend on industry output)
- » World prices of manufactured goods

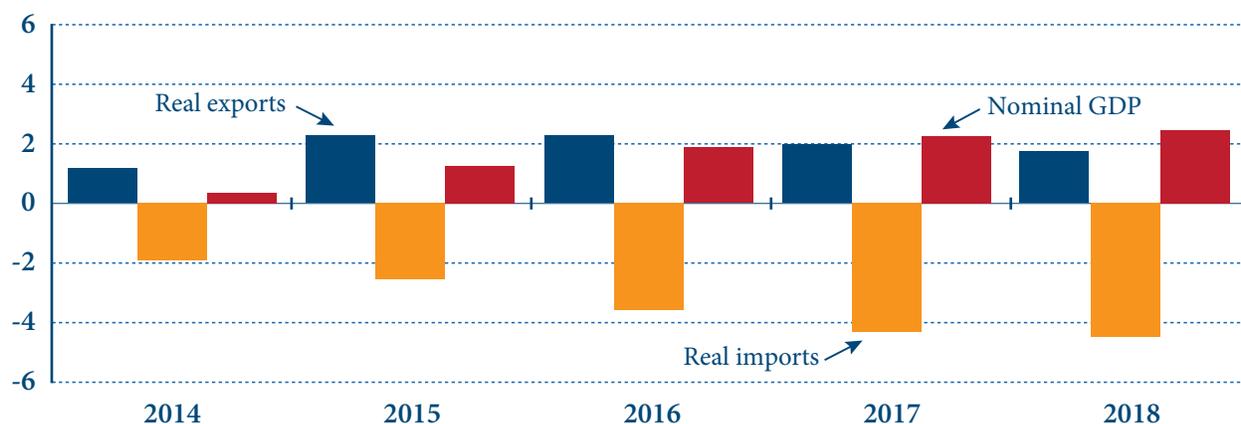
As summarized in the box above, this modeling structure enables us to systematically investigate how the depreciation of the yen might affect Japan's major trading partners. For example, some countries that compete with Japan in third-country markets might be hurt by a weaker yen, even with the offsetting benefit of stronger growth in Japan. A nation that doesn't compete as intensely in third-country markets might benefit by contributing much of the FVA component of a product exported from Japan.

# 10 Percent Yen Depreciation: A Benchmarking Exercise

A benchmarking exercise was performed to evaluate the full ripple effects of a 10 percent depreciation of the yen on a trade-weighted basis using the dynamic modelling framework outlined above. The currency loses 10 percent beginning in the first quarter of 2014. Real exports begin to improve in 2014, but the majority of the increase occurs in 2015, consistent with the lag we found in our export econometric equations. As displayed in Figure 21, real exports increase 1.1 percent above the baseline forecast (without further yen depreciation) in 2014, reaching a maximum difference of 2.3 percent in 2016, and declining to 1.8 percent above the baseline forecast in 2018. This pattern is accompanied by Japanese inflation and bond yields rising, reducing the yen's depreciation in inflation-adjusted terms.

**Figure 21 | Japan's economy during 10 percent yen depreciation simulation**

Percentage difference from baseline



Source: Milken Institute.

The implied elasticity of exports with respect to the yen was 0.23 as inflation reduced the price advantage. This was close to the 0.36 elasticity we estimated for merchandise exports over the 1983-2012 interval. This implied elasticity was much closer to the one obtained from regressions estimated for 1997 to 2012. Services exports increase more than merchandise exports proportionately but are much smaller in absolute terms.

The bulk of Japan's improved external position comes from slower import growth in response to the lower yen. During 2014, imports are 1.9 percent lower than the baseline and reach 4.7 percent less than the baseline by 2018. This is a stronger response than implied by the econometric import equations we estimated. Some of this difference is attributable to higher inflation pushing down the growth rate of real consumption expenditures, dampening demand for imports. Additionally, there appears to be more excess capacity in import competing industries than for export competitive categories. Nevertheless, the substitution of domestically produced goods and services for imports helps lift Japan's growth rate.

Nominal GDP is boosted by the depreciation in the yen, reflecting greater real activity and higher inflation. Real GDP growth isn't supported as much relative to the baseline due to moderating consumption. Nevertheless, higher inflation, wages, and real activity cause Japan's nominal GDP to increase by 0.35 percent above the baseline in 2014, 1.24 percent in 2015, and 2.38 percent in 2018.

Yen depreciation has a dampening effect on the economies of Japan's major trading partners, mostly felt by East Asian nations but weighing on the U.S. and Germany as well. This stems from weaker export growth to Japan and reduced market share in third-party nations. Taiwan's real GDP growth is reduced by 0.4 percent in 2015 relative to the baseline outlook, the most of any nation. Taiwan's export product mix most closely resembles that of Japan, curtailing its share of foreign markets.

Close behind in effect is South Korea, whose real GDP growth falls 0.3 percent relative to the baseline. As described earlier, Japan and South Korea make similar products (telecommunications gear, electronic components, light vehicles, and machinery) for export. Most ASEAN nations see real GDP growth diminishing by approximately 0.2 percent. As an indication of China and Japan's tightly linked production value chains, China's real GDP growth slows just 0.1 percent. Japan's heavy FDI in China has intertwined their manufacturing sectors. The U.S. and Germany witness a 0.1 percent reduction in real GDP growth. OPEC doesn't suffer from the lower yen as increased manufacturing output in Japan boosts petroleum demand.

## An Additional 20 Percent Depreciation Simulation

Expectations for Japanese growth have moderately, but meaningfully, improved since the introduction of Abenomics. Late-2012 consensus forecasts for Japan's real GDP growth in 2013 and 2014 were in the 0.7 percent range. Improved consumer confidence, partly related to "qualitative and quantitative easing" and fiscal stimulus, promoted real spending growth of 1.9 percent in 2013. Additionally, public-sector consumption and investment accounted for nearly 40 percent of Japan's economic growth in 2013. This was supported by an 8.8 percent advance in residential investment. Real GDP rose 1.5 percent in 2013. Current consensus real GDP forecasts call for growth around 1.1 percent over the medium term—2014 through 2018.<sup>47</sup>

This adjustment, while important in the medium term, is insufficient to alter Japan's long-term growth trajectory and encourage more investment. For example, business investment fell in 2013 despite corporate profits rising nearly 20 percent. For the five years beyond 2018, Japan's economy is anticipated to grow approximately 0.9 percent annually based on current policies. Although not targeted as a fundamental feature of Abenomics, yen depreciation has come to be affiliated with aggressive monetary policy. The currency slide has fostered higher import prices and fed core inflation, an objective of monetary action. However, the pass-through to wage growth has trailed broad inflation measures, causing real wages to fall year-over-year. Large corporations have heeded calls to increase wages, but small and medium-sized firms haven't regained sufficient confidence to do so.

Without further monetary stimulus, the benefits of depreciation will likely begin to subside in 2015. In the first quarter of 2014, the trade-weighted value of the yen appreciated more than 3 percent. It has risen against the RMB and the Hong Kong and Taiwan dollars. With downward pressure on ASEAN currencies due to current account imbalances, the yen could reverse course and retrace some of its depreciation. Although bolder action is needed on structural reforms, Japan could give its economy a further push without risking cultural opposition and political gridlock by adopting more aggressive monetary policy. This would be wise insurance as the sales tax hike could prove more contractionary than anticipated.

The QE program needs to be enlarged to produce an unequivocal shock and awe effect. Asset purchases by the Bank of Japan should expand by ¥20 trillion over the next 12 to 18 months. The combination of already

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47. Olivier Blanchard, "World Economic Outlook: Recovery Strengthens, Remains Uneven," International Monetary Fund, April, 2014, pp. 58-59.

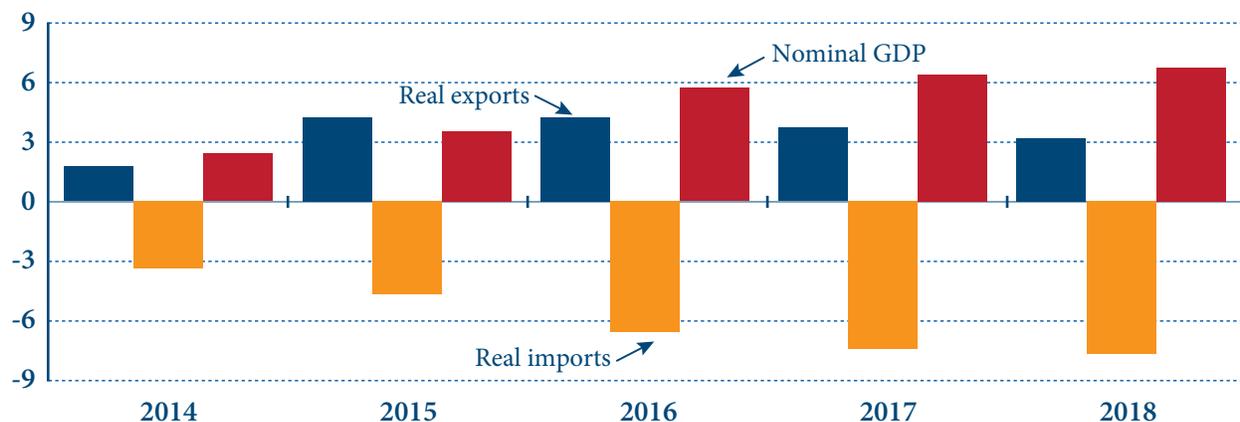
planned asset purchases with this incremental amount would bring the buying to around 10 percent of GDP.<sup>48</sup> Further, the BOJ needs to be quite clear in its communications that additional asset purchases will be made until inflation reaches 2 percent. BOJ Gov. Kuroda seems to accept that more may need to be done. On April 15, after returning from IMF meetings in Washington, D.C., he reportedly told Abe that the BOJ won't hesitate to adjust monetary policy if needed.<sup>49</sup> This policy would have two medium-term benefits for the economy: lower real interest rates with rising inflationary expectations and higher asset prices, and a significantly weaker yen. We believe this monetary strategy could result in a further 20 percent depreciation.

We evaluated just such a strategy by performing an alternative simulation with these parameters imposed on the Japanese economy. The results suggest that greater monetary easing, leading to further yen depreciation, would cause import prices to rise, and they would filter through to broader consumer price gains. In the simulation, Japanese consumer prices climb 9.1 percent relative to the baseline forecast by 2018. The 2 percent inflation target is met. However, foreign producers might not raise prices as rapidly as this exercise suggests. On the other hand, if foreign firms believed that the BOJ was committed to meeting and sustaining its 2 percent target, they might consider the new level of the yen permanent and pass through the majority of the yen depreciation as higher import prices for Japan.

A side effect of rising import prices and the spillover to the domestic side is lower real consumption spending. Average earnings rise with a longer lag than prices do, restraining purchasing power. Higher import prices and weaker growth in real consumer spending push import volumes much lower than in the baseline scenario. As highlighted in Figure 22, real imports are 3.7 percent lower than the baseline in 2014, 5.1 percent below it in 2015, and 8.3 percent less by 2018. The econometric model has a BOJ reaction function that shows it would push short-term interest rates higher, dampening consumption and therefore imports. It is quite possible, however, that the BOJ would move much less aggressively in raising short-term rates than historical precedent might indicate.

**Figure 22 | Japan's economy during further 20 percent yen depreciation simulation**

Percentage difference from baseline



Source: Milken Institute.

48. Adam Slater, "Japan: Abenomics, one year on," Oxford Economics, Research Briefing, April 14, 2014, pp. 4-5.

49. Maiko Takahashi and Toru Fujioka, "Kuroda Says He Told Abe BOJ Policy to Be Adjusted as Needed," Bloomberg News, April 15, 2014. <http://www.bloomberg.com/news/2014-04-15/abe-meets-with-kuroda-after-imf-gathering-boj-policy-decision.html>

Export volumes would receive a boost from the weaker yen. By 2015, real exports are 4.3 percent above the baseline, displaying the expected lag relationship. There would likely be pushback from some of Japan's big trading partners and competitors in third-party markets to the yen depreciating a further 20 percent. The results of the simulation show Taiwan's real GDP growth rate falling below the baseline by 0.8 percent in 2015 and South Korea's by 0.7 percent. These aren't negligible effects. Many other Asian nations would have to confront a 0.3 percent reduction in real GDP growth relative to the baseline. That loss would apply to the U.S. as well.

A very positive outcome from additional asset purchases is much stronger growth in nominal GDP. More aggressive monetary policy would appear to end deflation as a serious concern in Japan. By 2018, nominal GDP is 7 percent higher than the baseline outlook. Business investment is pushed higher, but not by a substantial amount due to the lack of structural reforms and an attendant rise in productivity.

## Third-Arrow Structural Reforms: A More Aggressive Approach

To fundamentally alter the long-term trajectory of the Japanese economy and increase potential GDP, bolder structural, supply-side reforms will be necessary. Such "third arrow" reforms have been lacking. This is disappointing, considering that Abe's Liberal Democratic Party has been firmly in control of both chambers of the Diet since last July's elections. Now is the time to push through more growth-friendly reforms before the party faces another election. With the working-age population set to decline, Japan must find ways to up the labor force participation rate and boost capital investment to escalate productivity growth.

Women's educational attainment in Japan is among the highest in the world. Yet disappointingly few either enter, are fully engaged in, or return to the workforce after childbirth. The female labor force participation rate—63 percent—is substantially below that of other wealthy OECD nations. Further, after having their first child, 70 percent of women drop out of the workforce for at least a decade. The comparable figure for the U.S. is only 30 percent.<sup>50</sup> Tomomi Inada, Japanese minister for regulatory reform, refers to this as the "M curve."<sup>51</sup>

The LDP has adopted a more liberal view of female involvement in the workforce since Abe was first elected prime minister in 2005. The argument at that time was it would lead to the disintegration of the traditional family and accelerate the fertility rate's decline. Reforms weren't enacted, and the fertility rate proceeded to fall further. Increasing the hours women can work before being subject to a higher marginal tax rate, providing more state-supported day care, and making it easier to breast-feed in the office would bring more mothers back into the labor force. Removing cultural barriers to managerial and professional positions for women should also help.

Another area ripe for reform is hiring and firing employees. Many large firms have people they don't need but retain because it would be too costly and burdensome to let them go. Changing these rules would encourage many firms to increase hiring because they would have the flexibility to downsize again if business conditions deteriorate. The bureaucratic burdens involved in starting a firm can be stifling as well. Reforms in business formation could assist long-term growth by reducing the disincentives for entrepreneurs.

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50. "Japanese Women and Work: Holding Back Half the Nation," *The Economist*, April 14, 2014, pp. 1-9. <http://www.economist.com/node/21599763/printthis> links to 3/29 article

51. Tomomi Inada, "Japan's Breakthrough in Its Economic Revitalization—Our Effort in Regulatory Reform," Event Transcript, Peterson Institute for International Economics, January 13, 2014.

Japan entered the Trans-Pacific Partnership negotiations and seems committed to removing trade barriers. If the country can help the parties come to an agreement, it would benefit greatly from its location in one of the world's most economically dynamic regions. Spurring global trade would promote expansion of Japanese exports. However, this would likely come at a cost, as agricultural trade barriers would be dismantled, aiding imports but harming powerful agricultural interests. Land reform that permits larger farm size would be necessary, along with accelerated leasing of agricultural land.

Another policy that could yield substantial benefits is lowering the corporate tax rate. An additional reduction could boost Japan's attractiveness for domestic investment and as a destination for FDI. Japan still has the second-highest corporate tax rate among advanced economies after the United States. A reduction of 5 percentage points could lead to more business investment, capital deepening and broadening, augmenting multifactor productivity growth. Modest administrative guidance or regulatory reform are incorporated, which would expand the corporate debt market and encourage less reliance on the banking sector. This should make Japan a more attractive geography for foreign investors as well.

We include monetary easing similar to that included in the previous 20 percent yen depreciation alternative scenario. Additional third-arrow structural reforms are built upon first- and second-arrow foundations.

In this alternative scenario, the overall labor force participation rate rises from 83.5 percent in 2013 to 89.5 percent in 2023 as the proportion of women begins to approach that of other advanced economies. Minor increases in the immigration quota are assumed as well, principally at the high- and low-skilled levels. By 2023, 1.5 million more workers are available to the economy, a gain of 2.3 percent. Nevertheless, even with this addition to the labor force, total employment in the Japanese economy would decline from 63.4 million in 2014 to 61 million in 2023, but that is substantially less than the baseline forecast. Table 15 compares the projected percentage differences in economic data between the more aggressive structural reform scenario and the baseline, and Table 16 tallies the projected percentage changes under the more aggressive reforms.

**Table 15 | Percentage difference from baseline under more aggressive structural reform scenario**

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Labor force participation rate	0.12	0.35	0.82	1.17	1.63	1.86	2.09	2.19	2.18	2.29
Gross fixed investment	0.02	0.26	0.66	1.33	1.89	2.34	2.87	3.51	4.10	4.52
Real GDP per employee	0.06	0.28	0.70	1.25	1.73	2.29	3.04	4.01	5.12	6.27
Real exports	0.16	0.74	1.63	2.84	3.60	4.22	4.84	5.50	6.18	6.92
Real imports	-0.35	-0.87	-1.89	-2.73	-3.27	-3.62	-3.79	-3.90	-4.11	-4.56
Industrial output	0.20	0.72	1.66	2.92	3.68	4.41	5.18	6.02	6.93	7.68
Real disposable income	0.01	0.02	0.03	0.07	0.38	0.81	1.28	1.67	2.09	2.31
Real consumption	0.01	0.02	0.03	0.04	0.19	0.57	1.21	1.98	2.68	3.31
Real GDP	0.09	0.28	0.81	1.38	1.91	2.42	3.11	3.78	4.57	5.32

Source: Milken Institute.

**Table 16 | More aggressive structural reform scenario, annual percentage change**

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Labor force participation rate	1.32	0.71	0.82	0.70	0.69	0.57	0.51	0.57	0.45	0.56
Gross fixed investment	3.47	0.72	0.61	1.62	1.78	1.88	2.00	2.05	2.00	1.82
Real GDP per employee	1.17	2.20	2.14	2.54	2.01	1.86	1.82	1.78	1.87	1.88
Real exports	6.66	9.60	7.52	5.84	4.86	4.26	3.37	2.23	1.81	1.91
Real imports	5.19	4.76	3.70	4.27	4.02	3.17	2.59	2.16	1.66	1.12
Industrial output	6.07	6.05	4.50	3.70	2.64	2.04	1.81	1.78	1.39	1.32
Real disposable income	0.04	0.74	0.58	1.32	1.40	1.42	1.15	1.35	1.14	1.00
Real consumption	0.57	0.52	0.31	1.14	1.00	1.27	1.49	1.63	1.65	1.54
Real GDP	1.60	1.69	1.39	1.91	1.54	1.43	1.46	1.56	1.63	1.60
PPI	3.14	1.62	2.27	1.38	0.95	0.88	0.87	0.84	0.89	1.05
CPI	2.37	1.60	2.02	1.27	1.03	0.89	0.95	0.87	0.91	1.04

Source: Milken Institute.

The combination of lower corporate taxes, more open labor markets, and expanded direct access to capital encourages businesses to enhance capital expenditures. Additionally, higher incomes and consumption among women in the labor force support more fixed investment. By 2023, gross fixed investment surpasses the baseline forecast by 4.5 percent.

Greater investment in capital equipment promotes productivity growth in the Japanese economy, improving its international competitive position. Productivity across the economy (real GDP relative to employment) rises an average of 0.6 percent per annum more than the baseline forecast over the decade. Most of this is attributable to multifactor productivity growth, not labor or capital. The productivity boost, combined with yen depreciation, pushes real exports up 6.9 percent relative to the baseline in 2023.

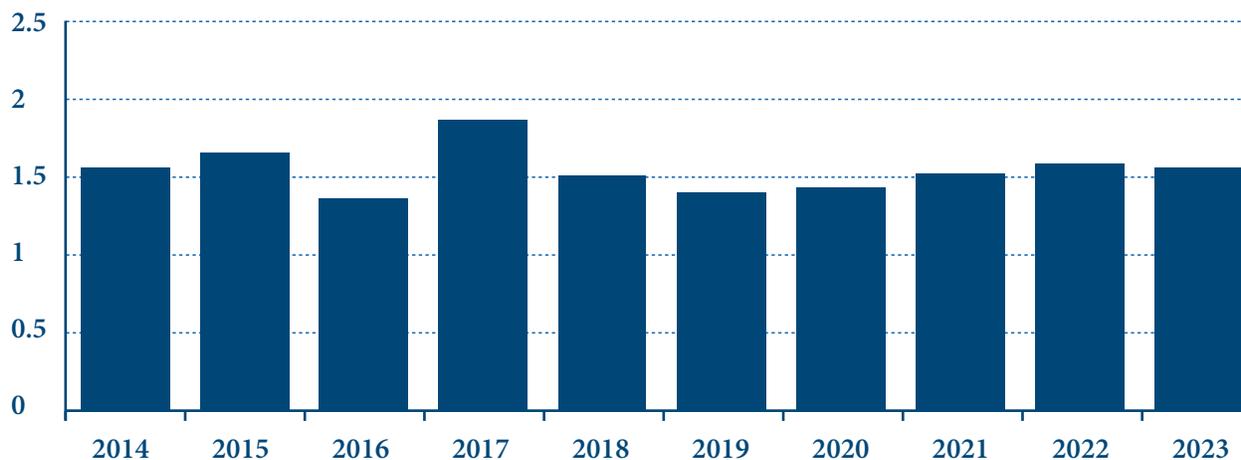
Quicker growth in Japanese final demand offsets some of the loss of competitiveness among its trading partners. Imports rise more than in the 20 percent further depreciation scenario, dampening the effect of the yen's fall on foreign economic growth. Japan's major trading partners see their GDP growth slow an average of 0.1 percent annually through 2023, which would seem to be an acceptable trade-off for expanding long-term demand for their exports to Japan. Furthermore, higher sustained productivity growth modestly lifts the yen's value by 2023. Nevertheless, Japan's industrial output is 7.7 percent greater than the baseline forecast.

Wage growth improves relative to the baseline as firms share productivity-driven profits with their employees. By 2023, real disposable income rises 2.3 percent compared to the baseline. Strong equity markets push household wealth up, and real consumption expands slightly more than real disposable income.

Japan's real GDP growth improves to 1.6 percent annually over the next decade, 0.6 percent higher than the baseline projection (see Figure 23). For an economy grappling with a declining labor force, this is an impressive expansion. By 2023, Japan's real GDP is 5.3 percent higher than the baseline. An added benefit from the growth in nominal GDP is that the government debt-servicing burden declines relative to income and the annual budget could come close to being balanced. This assumes, of course, that Japan doesn't embark on new government programs that would offset this hard-earned windfall.

**Figure 23 | Japan's growth rate with more aggressive structural reforms**

Projected real GDP growth, percent



Source: Milken Institute.

In comparison, the IMF developed its G20 Model (G20MOD) and used it to compare the potential effects of the three arrows when they are completely implemented to scenarios in which they are partially deployed, to one degree or another.<sup>52</sup> This analysis found divergent effects on Japan's likely growth trajectory. Most importantly, it found that the structural reforms component was essential to enhancing investment, employment, and productivity.

The IMF's complete Abenomics alternative simulation suggested that potential real GDP growth could be boosted from the baseline 1 percent to 2 percent annually, a dramatic increase. Part of the response came from improving business and consumer confidence and inflationary expectations rising to meet the stated 2 percent goal by the end of 2015. The structural reforms and fiscal consolidation were mutually reinforcing. In the complete Abenomics scenario, the ratio of public debt to GDP begins to decline rather than continuing on its upward trajectory.

52. Dennis Botman, Benjamin Hunt, Zoltan Jakab, and René Lalonde, "Abenomics: Risks After Early Success?" World Economic Outlook, International Monetary Fund, October 2013, pp. 50-52.

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As the world's third-largest economy, Japan remains critically important to its Asian neighbors, the United States, and prospects for growth worldwide.



# Conclusion

**A**s soon as you accept the notion that Japan will never change, suddenly it does—but after a tipping point is reached. It was forced to open to the outside world after Commodore Perry’s Black Ships arrived, setting off the Meiji Restoration. It next decided it must have a colonial empire in Asia, much as the Western powers did throughout the world. Japan then embarked on a catastrophic, violent colonization of Asia that expanded World War II into the Pacific and led to its ultimate unconditional surrender to the U.S.<sup>53</sup> It rebuilt its industrial base after the war and became a model for developing Asian economies to emulate.

After two decades of lost growth, it appears that a confluence of events might provide Japan another opportunity to leave its economic malaise behind. The March 2011 earthquake and the resulting Fukushima nuclear disaster brought Shinzo Abe back to power because his call for radical economic surgery resonated.

The first two arrows of Abenomics have been launched. However, the third arrow, structural reforms, will determine Japan’s ultimate success in ending deflation and restoring a modicum of its long-term economic strength. The first arrow, aggressive monetary action, has had the indirect effect of pushing down the value of the yen in excess of 20 percent. However, the weaker currency won’t have the power to stimulate Japanese exports that it once had because its multinationals have invested so much capital in China and in ASEAN countries. Nevertheless, Japan remains a hub for the intraregional Asian supply chain.

The third arrow of Abenomics offers citizens an opportunity to correct course. Bolder measures to stimulate the supply side of Japan’s economy are necessary. A combination of improving women’s workforce participation, easing some labor market rigidities, further reducing the corporate tax rate, expanding the corporate bond market, and the completion of the Trans-Pacific Partnership to boost trade would make Japan a more attractive destination for investment. It is up to Japan to decide how much it will change to achieve that objective. But such change should be encouraged. As the world’s third-largest economy, it remains critically important to its Asian neighbors, the United States, and prospects for growth worldwide.

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53. David Pilling, *Bending Adversity: Japan and the Art of Survival*, (New York, NY, Penguin Press, 2014), pp. 55-74.



## About the Author

Ross DeVol is chief research officer at the Milken Institute. He oversees research on international, national, and comparative regional growth performance, technology and its impact on regional and national economies, access to capital and its role in economic growth and job creation, and health-related topics. His recent research has focused on global economic and financial market conditions. DeVol has authored numerous reports in the Institute's primary research areas. He was the principal author of "The Global Biomedical Industry: Preserving U.S. Leadership," a study that showed the United States still leads the biomedical field, but countries across Europe and Asia are aggressively pursuing plans to close the gap. "A Matter of Degrees: The Effect of Educational Attainment on Regional Economic Prosperity" demonstrated the high returns to investment in higher education and the research spillovers that universities facilitate. He also authored "America's High-Tech Economy: Growth, Development and Risks for Metropolitan Areas" and created "Best-Performing Cities," an annual ranking of U.S. metropolitan areas that shows where jobs are being created. DeVol was previously senior vice president of Global Insight Inc. DeVol is ranked among the "Super Stars" of Think Tank Scholars by International Economy magazine. He appears and is quoted frequently in the media.



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