

The Over-Valued Yen and the Low-Pressure Economy Repressed Productivity in Japan

Koichi Hamada¹ & Koji Nomura²

¹ Tuntex Professor Emeritus at Yale University, New Haven, the U.S.

² Professor at Keio Economic Observatory, Keio University, Tokyo, Japan

Correspondence: Koji Nomura, Keio Economic Observatory, Keio University, Tokyo 108-8345, Japan. Tel: 81-3-5427-1478. E-mail: nomura@sanken.keio.ac.jp

Received: March 25, 2023

Accepted: April 21, 2023

Online Published: April 25, 2023

doi:10.5539/ijef.v15n6p1

URL: <https://doi.org/10.5539/ijef.v15n6p1>

Abstract

In the post-war economy of Japan, the high-pressure economy as defined by Okun and Yellen maintained its real exchange rate relatively low and kept the economy mildly inflationary. Not only did it encourage short-term employment but it also fostered a long-term productivity trend as measured by its total factor productivity (TFP). International pressure for a stronger yen after the Plaza Accord, coupled with the restrictive monetary policy of the Bank of Japan, created a large exchange rate gap and accordingly, the extreme Japan-U.S. output price gap, referred to as the price level index (PLI), in 1995. It further caused the squeeze of domestic wages and led to the deflationary pressure that plagued the Japanese economy for decades. In our opinion, the exchange rate also depressed domestic capital accumulation caused by the internationally low nominal rate of return on capital and that situation caused the TFP stagnation in Japan.

Keywords: high-pressure economy, price level index, real exchange rate, reallocation effect, wage restraint, total factor productivity

1. Introduction

In the early 2000s, Hamada, who was a head of the Economic and Social Research Institute, the Cabinet Office of Japan, believed that too austere monetary policy of the Bank of Japan (BOJ) was causing excessive yen appreciation and thus hurting the Japanese industries. Monetary policy works directly on the exchange rate, but the Ministry of Finance, as the Treasury in the case of the U.S., is the main agency in charge of exchange rates. Hence, Hamada visited the Vice Minister of Finance and asked him if the current exchange rate was too high. He replied that there was nothing to worry about because the yen exchange rate was much weaker now than it had been five years earlier, and even the real exchange rate index, which took prices into account, showed that the yen had depreciated. The dollar exchange rate reached its highest (up to that time) in April 1995, three months after the Great Hanshin Earthquake, at 79.75 yen per dollar. Thus, the fact that the yen had weakened compared to when it was at its highest does not reassure us of the proper yen level. Hamada should have protested the complacency of the Vice Minister.

In the present world, where the financial markets are highly integrated, exchange rates are determined by the asset equilibrium so that existing yen-denominated and dollar-denominated assets are exactly held in the world market. In the event of an earthquake, for example, citizens of the stricken country will try to keep more of their currency for safety or precautionary motives so that the currency of the stricken country will appreciate, contrary to what one might suspect. In 1995, the industries devastated by the Great Hanshin Earthquake were also hit hard by the excessive yen appreciation. It is no coincidence that the yen reached an all-time high in October 2011 (75.54 yen per dollar) after the Great East Japan Earthquake in March.

Like the stock market, the foreign exchange market is a market for assets. The world market determines the exchange rate for dollar-denominated and yen-denominated assets from time to time so that asset holders are satisfied with the relative price, i.e., the exchange rate, at which they can hold their assets. Compared to the market for flows of goods and services, the asset market price often fluctuates wildly. Since individuals and firms worldwide cannot instantly influence the exchange rate by themselves, they must do business based on the exchange rate determined by the market. The nature of exchange rate precedence in the Japanese economy will

be discussed in Section 2.

Some people benefit from the strong yen. Importers can import goods at lower domestic prices when prices in the country of production remain the same. Foreign travelers from home, of course, also benefit because they can travel at lower prices. Also, beneficiaries are those who import mineral resources and energy. However, a strong yen puts direct pressure on corporate profits for many exporters and producers who produce goods competing with imported goods. Suppose the yen appreciates rapidly in the foreign currency market. For exporters, if the dollar price of exports remains constant, then the yen price for domestic exporters will become lower, making the cost of production exceed the exporter's selling price. The same will happen to domestic firms competing with imports because the yen-denominated price becomes cheaper. Producers have to cut costs to compensate for this negative impact on earnings.

How could the necessary cost reduction be achieved? First, productivity could be increased, but this may be a "make-believe" because firms have already made unrelenting efforts to improve efficiency. For firms, main reduction efforts will be directed at labor costs. While decreasing employees' scheduled wages may be difficult, they can be reduced by reducing bonuses and overtime pay or switching employees from regular to non-regular workers for the same jobs. This was what happened in the Japanese economy.

Section 2 reviews Japan's experience with long-term economic growth since 1955 and identifies why the exchange rate was excessively strong in 1995. Section 3 shows that the Japanese economy, which until the mid-1980s had been run by a "high-pressure economy," shifted to a "low-pressure economy." This led to domestic wage restraint (Section 4) and productivity stagnation (Section 5), which in turn became the source of deflationary pressures that have plagued the Japanese economy for a long time. Section 6 discusses how the transition to the realization of a high-pressure economy should be made. Section 7 concludes.

2. Japan's Price Competitiveness

First, let us see the evolution of the domestic-foreign price differentials that the Japanese economy has faced. In contrast to the "price index," which indicates price changes over time, the cross-sectional price differential between countries is called the "price level index (PLI)." The PLI for output is the principal indicator of international competitiveness, often expressed in the over- or under-valuation of currencies, for example, the over- or under-valuation of the Japanese yen relative to the U.S. dollar. This is defined as the ratio of the purchasing power parity (PPP) for outputs (goods and services) to the market exchange rate (Note 1). The PPP represents the price of a product produced in Japan, expressed in yen, relative to the price in the U.S., expressed in dollars. By comparing this relative output price with the market exchange rate of the yen and the dollar, we concretely measure the price barrier Japanese producers face in competing with their U.S. counterparts in international markets.

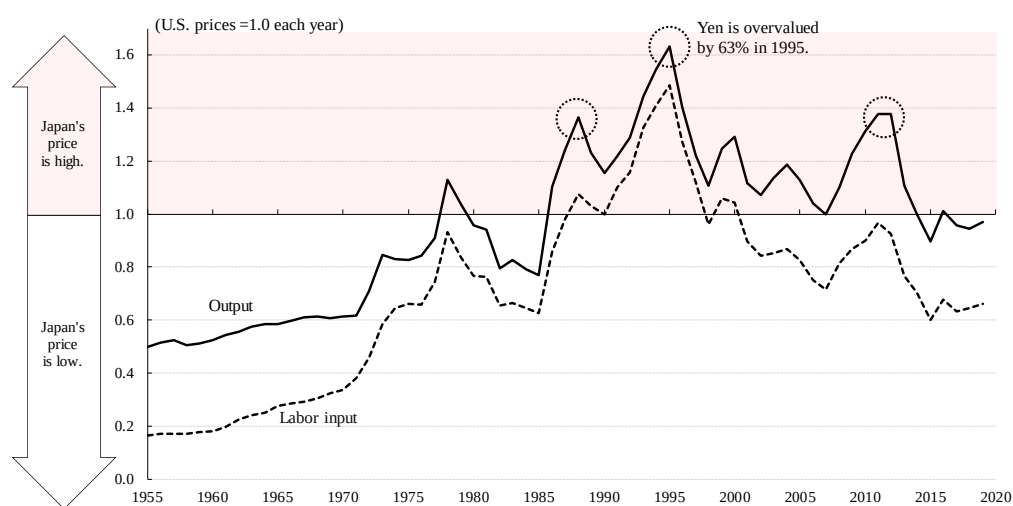


Figure 1. PLIs for output and labor input, 1955-2019

Note. The U.S. prices are defined as 1.0 for each year. The PLI for output (GDP) is an aggregate from industry-level measures of PLIs for value added, and the PLI for labor input is defined as the quality-adjusted labor input prices.

Data Source. Updated estimates by Jorgenson, Nomura, and Samuels (2016).

Figure 1 shows the post-war comparison of the price differentials in output and labor input between Japan and the U.S., aggregated from the industry-level PLIs for value added (net output) and labor input. There exist differences in industrial structures and educational background and the age structure of workers between the two countries. The PLIs in Figure 1 consider such qualitative differences between Japan and the U.S. as much as possible, measured by Jorgenson, Nomura, and Samuels (2016).

When the Japan-U.S. output PLI (bold line in Figure 1) is less than unity, the output price of products produced by the Japanese industry is cheaper than those of the U.S., making Japan's price competitive at the aggregate level (Note 2). Until the mid-1980s, the exchange rate was smaller than the PPP, the exchange rate between the yen and the dollar that equalized output prices between Japan and the U.S. The output PLI shows that Japanese output prices were cheaper than the U.S., by approximately 40 percent, in the 1960s (Note 3). Japanese companies with price competitiveness easily found demands for their products overseas and prospered. Because of the weak yen, the domestic economy was under continuous and gentle inflationary pressure.

The yen-dollar rate, fixed at 360 yen, was revalued in 1971 and shifted to a floating exchange rate system after 1973, resulting in the yen's appreciation. Ito (2022) and Ito, Isard, and Symansky (1999) have argued that the appreciation of the real exchange rate (PLI in this paper) has been well explained by the Balassa-Samuelson hypothesis. This hypothesis states that, under certain assumptions, if productivity in a country's traded sector rises faster than in its non-traded sector and the difference in the rate of increase is higher than in its trading partners, PLI will rise regardless of whether the exchange rate is fixed or floating.

Productivity should be measured in terms of total factor productivity (TFP), which represents overall production efficiency, considering capital and labor inputs. Figure 2 depicts the TFP-PLI diagram in the Japanese economy from 1955 to 2019 to discuss the suitability of the Balassa-Samuelson hypothesis. The vertical axis is the output PLI (same as Figure 1), and the horizontal axis is the ratio of the Japan-U.S. TFP gap in manufacturing to that in non-manufacturing. The upper right movement would be a situation where the Balassa-Samuelson hypothesis is valid, but that was until the early 1980s.

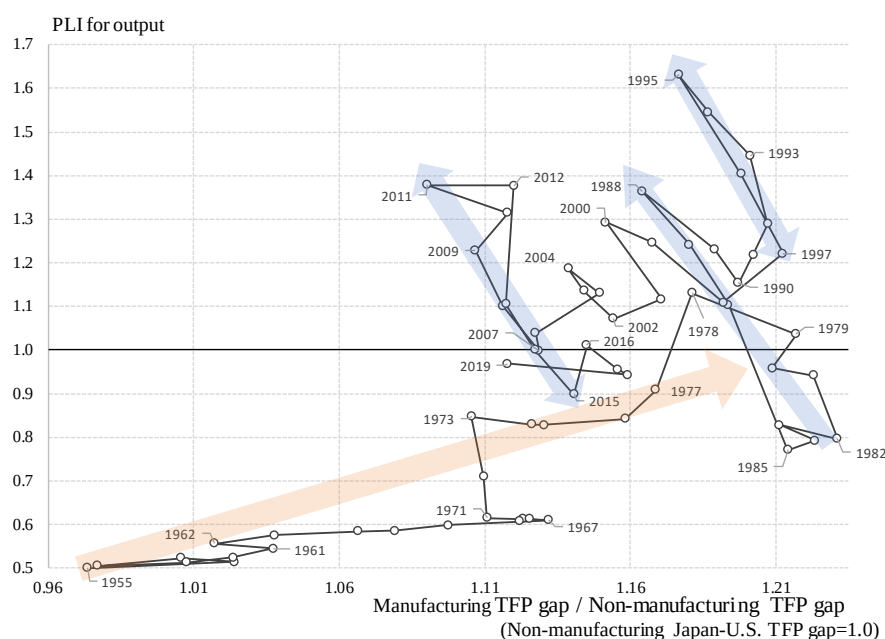


Figure 2. Validity of Balassa-Samuelson hypotheses, 1955-2019

Note. The Japan-U.S. TFP gap in the non-manufacturing sector is defined as 1.0 for each year on the horizontal axis, and the U.S. price is defined as 1.0 for each year on the vertical axis.

Data Source. Updated estimates by Jorgenson, Nomura, and Samuels (2016).

Movements since the 1980s have been rather the opposite, with mainly upper-left phases. In three phases of excessive yen appreciation, the trend was such that the yen moved to the upper left and then to the lower right (the position before the change). These indicate that exchange rates are not the result of changes in productivity gaps but rather a condition of competition in the Japanese economy over the past 40 years.

The actual exchange rate of the yen was still weak, and, as Figure 1 shows, even in 1975, Japan's output prices remained roughly 20% cheaper. This exchange rate environment was a "high-pressure economy" form that created an excess macroeconomic demand in the domestic economy unless Japan tightened its monetary policy. The yen appreciated in the late 1970s. After 1982, when the Japan-U.S. TFP gap in manufacturing relative to non-manufacturing was at its highest (Figure 2), Japan's output prices were again 20% below the U.S. level, and the Japanese economy continued to prosper. Naturally, the business and political circles in the U.S., which competed with Japanese products, became increasingly frustrated.

3. Transition to Low-Pressure Economy

In September 1985, Noboru Takeshita, then Minister of Finance, left home in golf clothes pretending to play golf near his home but changed into formal wear on the plane and flew to New York (Note 4). At the Plaza Hotel, a meeting began on the Plaza Accord, an attempt by Japan, the U.S., the UK, France, and Germany to significantly adjust the yen value. After that, currency adjustment meetings would dance in historic places worldwide, such as the Chateau de Rambouillet and the Louvre.

After the Plaza Accord, the rising yen rate naturally drove the Japanese economy. The BOJ and the Ministry of Finance feared the aftermath of the agreement perhaps more than necessary. BOJ Governor Satoshi Sumita (in office from December 1984 to December 1989), who came from the Ministry of Finance, adopted an accommodative monetary policy, which induced asset price bubbles, including land and stocks. On December 29, 1989, the Nikkei Stock Average hit an all-time high of 38,915 yen (Note 5).

Until the Plaza Accord period, the postwar Japanese economy was somewhat inflationary, or what Arthur Okun (1973) and Janet Yellen (2016) call the "high-pressure economy." A high-pressure economy is one in which the national economy is at full employment, and the local currency weakens, leading to mild inflation if left unchecked. Okun noted that it is easier to transfer labor from inefficient to efficient industries there, technological progress is easier, and, as discussed below, investment in domestic technological development is more likely to occur.

However, BOJ Governor Yasushi Mieno (in office from December 1989 to December 1994) shifted monetary policy into extreme austerity. The Japanese media cheered him like an "Onihei," a Sherlock Holmes-like figure in the Edo period, for his heroic extermination of the bubble economy. The bubble soared, and some of his initial efforts could be justified. However, what mattered in the next half of the Post-war economy was his persistence in the policy of extreme monetary austerity. After the bubble was suppressed, from 1990 to 1995, the Japanese economy began to show signs of a chronic slowdown, which has continued to the present.

How would the exchange rate have affected the profitability of capital in Japan? Figure 3 compares the exchange rate (vertical axis) and the ex-post realized nominal rate of return on capital (horizontal axis) for each BOJ governorship since 1990. If a stronger yen (a downward shift) lowers the domestic rate of return (a leftward change) and, conversely, a weaker yen (an upward shift) increases the rate of return (a rightward change), the graph would be rightward. For a tightening president, the point on the graph moves to the lower left after taking office. As seen in Figure 3 (upper left), the nominal rate of return declined to negative while the yen appreciated during the term of Governor Mieno. The situation was relatively similar when Governors Hayami (middle left) and Shirakawa (bottom left), both once insiders of the BOJ, favored tightening policies. During these periods, Japan's economy shifted to a "low-pressure economy," a deflationary state with underemployment and overcapacity, with the yen's appreciation far exceeding the output price differential.

Returning to Figure 1, after the Plaza Accord, there were three periods of excessive yen appreciation when the Japan-U.S. production price differential persistently exceeded one, as circled. The yen appreciation in 1995 was an all-time high regarding the Japan-U.S. production price differential. At that time, the yen was overvalued by 63% in the foreign exchange market, putting Japanese companies at a tremendous disadvantage.

The exchange rate anomaly at this time was also evident in the PLI for labor input, depicted by the dashed line in Figure 1. The yen appreciation in 1995 drove homogeneous labor services in Japan 48% higher than in the U.S. At the time, Japanese manufacturers such as automakers had a significant advantage over their U.S. counterparts at the TFP level. Even with a certain degree of yen appreciation, there was still room for price competitiveness. However, the yen overvaluation to such an extent in 1995 resulted in the loss of competitiveness in almost all Japanese industries.

The correction of the yen's appreciation took time, with successive steps. Still, the quantitative easing policy substantially pursued by BOJ Governor Toshihiko Fukui (in office from March 2003 to March 2008) brought the yen back to a level where the price competitiveness of Japan and the U.S. once again reached parity in 2007. As

shown in the middle right of Figure 3, during Fukui's term, the economy almost recovered as the yen continued to weaken and the profit rate began to increase. However, the economy was set back by another step due to his hasty lifting of the zero-interest rate policy.

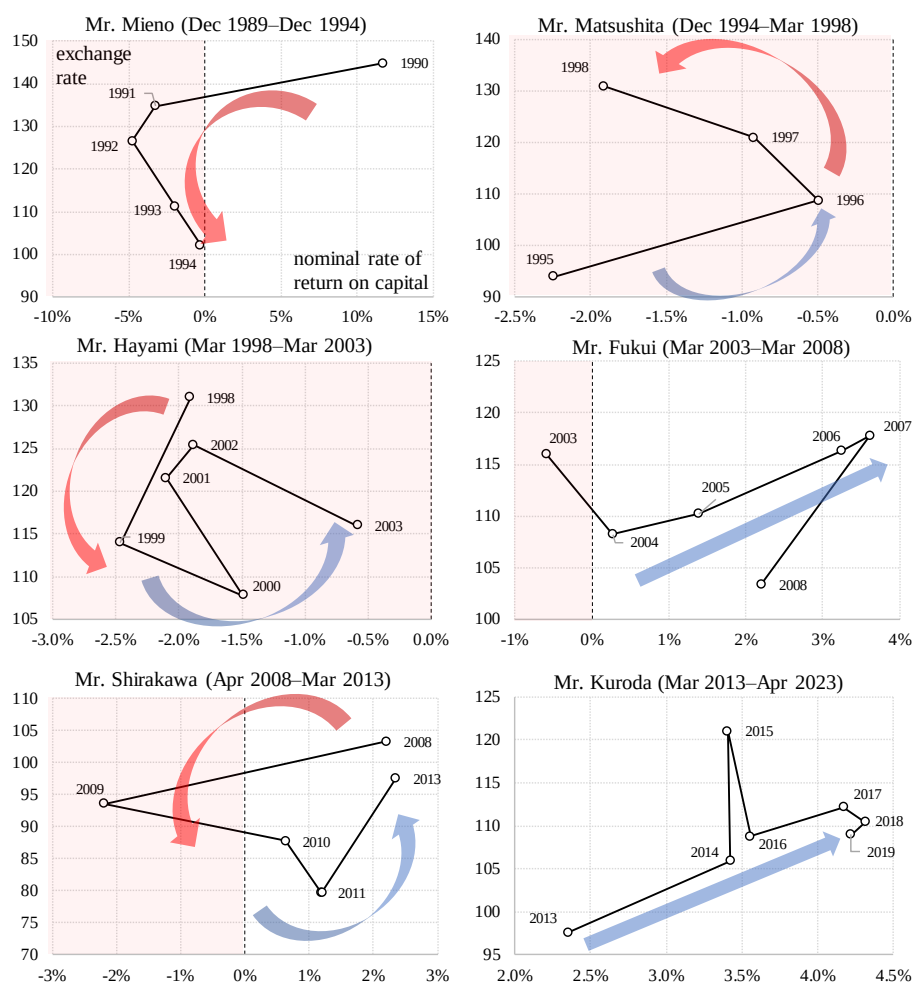


Figure 3. Exchange rate and rate of return on capital by BOJ governor period, 1990–2019

Note. Yen per U.S. dollar for the exchange rate in the vertical axis and percentage for the nominal rate of return on capital (Figure 8) in the vertical axis.

4. Sources of Deflationary Pressure

The output price differential that reached an all-time high level in 1995 was corrected by 2007. It is worth tracing the changes during that period to understand the economics of the transition. During 1995–2007, the yen also depreciated but only by 29 percentage points out of an overvaluation (63%) of the yen, as shown in the left chart of Figure 4. The remainder of the gap forced industries to adapt by reducing output prices through cost-cutting. This was the source of the deflationary pressure that plagued the Japanese economy for so long.

According to the Japan-U.S. harmonized productivity account developed by Jorgenson, Nomura, and Samuels (2016), this narrowing of the output price gap can be understood by breaking it down into structural factors. First, rather than Japan eliminating the gap through productivity improvements, the TFP gap between Japan and the U.S. widened (Figure 9). It has rather raised the output price of Japan, creating a higher hurdle for cost reductions to which the real economy must adapt. It is important to note that TFP reflects various technological advances, particularly the accelerated progress of information and communication technology (IT) during this period. Japan and the U.S. have seen rapid improvements in TFP in the IT manufacturing sector. Therefore, to assess the impact of exchange rate changes, it is necessary to look at changes in bilateral differences in TFP rather than changes in TFP for one country (Note 6).

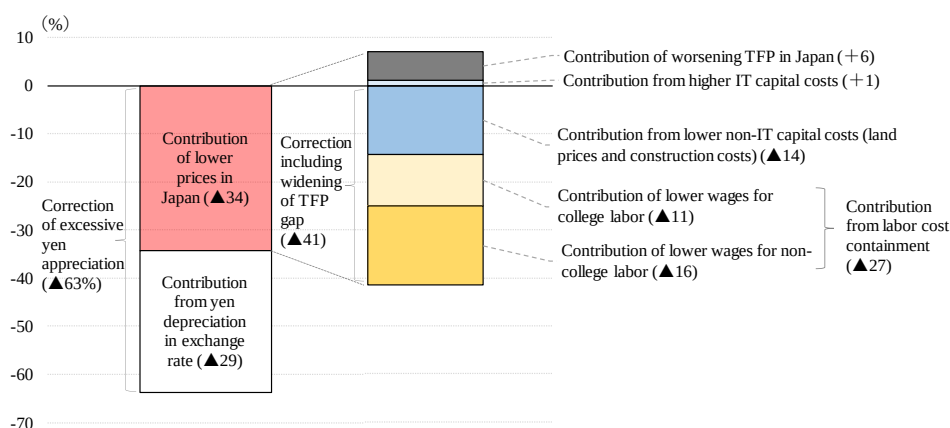


Figure 4. Over-valued yen and sources of deflationary pressure, 1995-2007

Note. All figures are defined by their contributions (percentage points) to correcting the yen overvaluation from 1995 to 2007.

Data Source. Updated estimates from Jorgenson, Nomura, and Samuels (2016).

The Japanese economy was forced to cut costs by 41 percentage points to overcome this hurdle. As shown in the right chart of Figure 4, two-thirds of this reduction, or 27 percentage points, was achieved through relative decreases in Japan's labor cost (Note 7). Wages in the U.S. rose during this period, but this was not enough to eliminate the output price gap between the two countries (Figure 1). The elimination of the gap was achieved by devaluing nominal wages in Japan.

The intensity of the labor cost reductions can be seen in the upper chart of Figure 5, which compares nominal labor input prices in Japan and the U.S. The structure of the workforce changed dramatically during this period, as we observed the expansion of part-time workers and female employment in Japan. However, the quality-adjusted labor input prices, namely hourly wages that accounted for such changes, declined from 1997 to 2007. The wages, which once stopped falling, dropped again during the subsequent Governor Shirakawa administration and only began to rise again during *Abenomics* (Note 8).

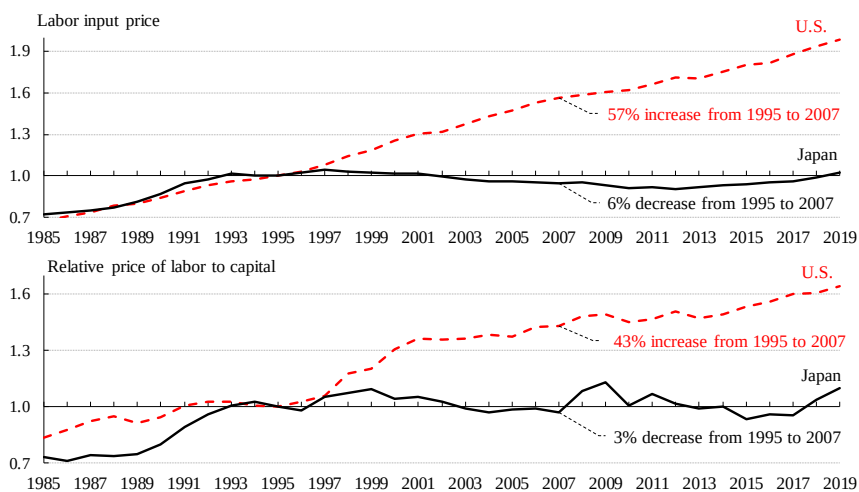


Figure 5. Unusually suppressed Japanese wages, 1985-2019

Note. The indices in 1995 are defined as 1.0 in each country, based on local currency units.

Data Source. Updated estimates from Jorgenson, Nomura, and Samuels (2016).

The remaining 14 percentage points of forced cost reduction were realized through lower capital costs in Japan. The difference between domestic and foreign prices for acquiring tradable capital goods is small, making it difficult to create a disparity in the user cost of capital. As shown in the right-hand chart of Figure 4, the suppression of capital cost was achieved exclusively through the reduction of Japanese land prices and construction costs. According to the Japanese System of National Accounts, overall land prices for residential

land continued to fall from 1990 to the temporary halt of 2005 (then fell again during BOJ Governor Shirakawa's tenure and bottomed out in the mid-2010s) (Note 9). Indeed, this directly lowers the cost of capital input, but the expectation of the future decline of land prices will offset the reduction. The fall in land price worked against investment. Severe land price declines also crippled real estate collateralized lending, on which Japanese financial institutions relied heavily (Kiyotaki & Moore, 1997).

The bottom chart of Figure 5 shows that the relative price of labor to capital rose 43% in the U.S. between 1995 and 2007, while it declined by 3% in Japan during the same period. This is highly unusual in the growth experiences of major economies. Japanese businesses thus lost incentives to invest positively in labor-saving devices and, consequently, the most important engine for labor productivity enhancement.

Okun (1973) emphasized the role of upward labor mobility in a high-pressure economy. Figure 6 presents the decomposition of Japan's quality-adjusted labor input (QALI) change from 1955 to 2019. The QALI change consists of changes in hours worked and their quality factor. The quality factor is defined here as two effects: the intra-industry effect, which increases when higher-skilled workers expand (Note 10), and the reallocation effect, which increases when workers shift from industries that use labor inefficiently to industries that use it efficiently.

The reallocation effect was significant in the Japanese economy, which had been managed as a high-pressure economy, as shown in Figure 6. If labor productivity is defined as output per hour worked, the reallocation effect has been a major factor in improving labor productivity. The expansion of the higher-educated workforce began to take effect after the mid-1960s. Gradually after that, most of the labor quality change came from improvement in the intra-industry impact, and the reallocation effect became smaller. After Japan's transition to a low-pressure economy in the mid-1980s, the reallocation effect seems to stagnate. However, the role of upward mobility in the Japanese economy had originally shrunk, and its further shrinkage was not a major factor in the stagnation of labor productivity.

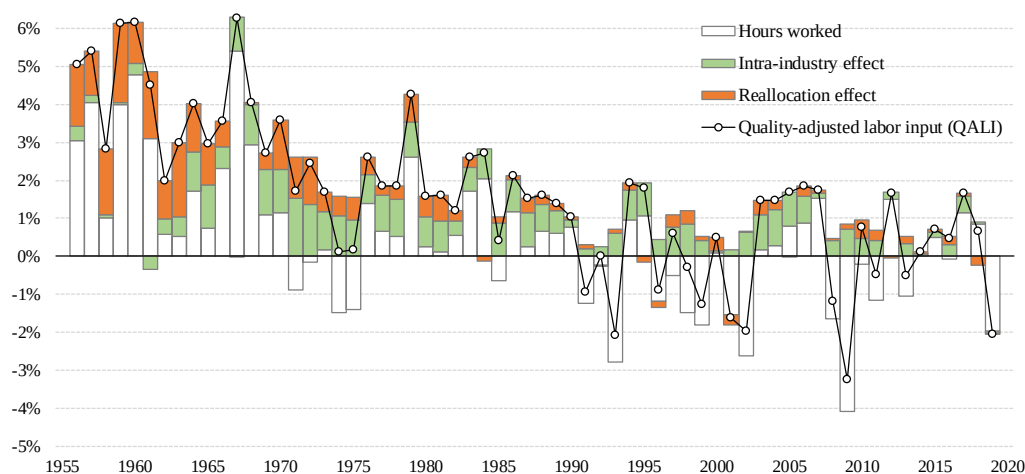


Figure 6. Reallocation effect of labor, 1955-2019

Data Source. Updated estimates from Jorgenson and Nomura (2005).

5. Low-Pressure Economy Causes Productivity Stagnation

The main factor that has stagnated productivity is a slump in capital accumulation in various industries. Figure 7 compares changes in capital input by industry in Japan and the U.S. during the adaptation period to the excessive yen appreciation, 1995-2007, discussed in Figure 4 in Section 4. The vertical axis indicates capital inputs in Japan, and the horizontal axis indicates those in the U.S. The figure shows that capital input in Japan was strikingly slower than in the U.S. in industries, as most industries are located below the 45-degree line.

So many Japanese industries, from manufacturing to services, were investing, ranging from 1% to 6% per year on average from 1995 to 2007, at a much slower pace than the U.S. counterparts. While some point to Japan's lagging IT investment, the relative contribution of IT and non-IT capital inputs was not significantly different between Japan and the U.S. since the mid-1990s (Jorgenson and Nomura 2005, Figure 3). The total amount of capital accumulation itself in Japan lagged far behind.

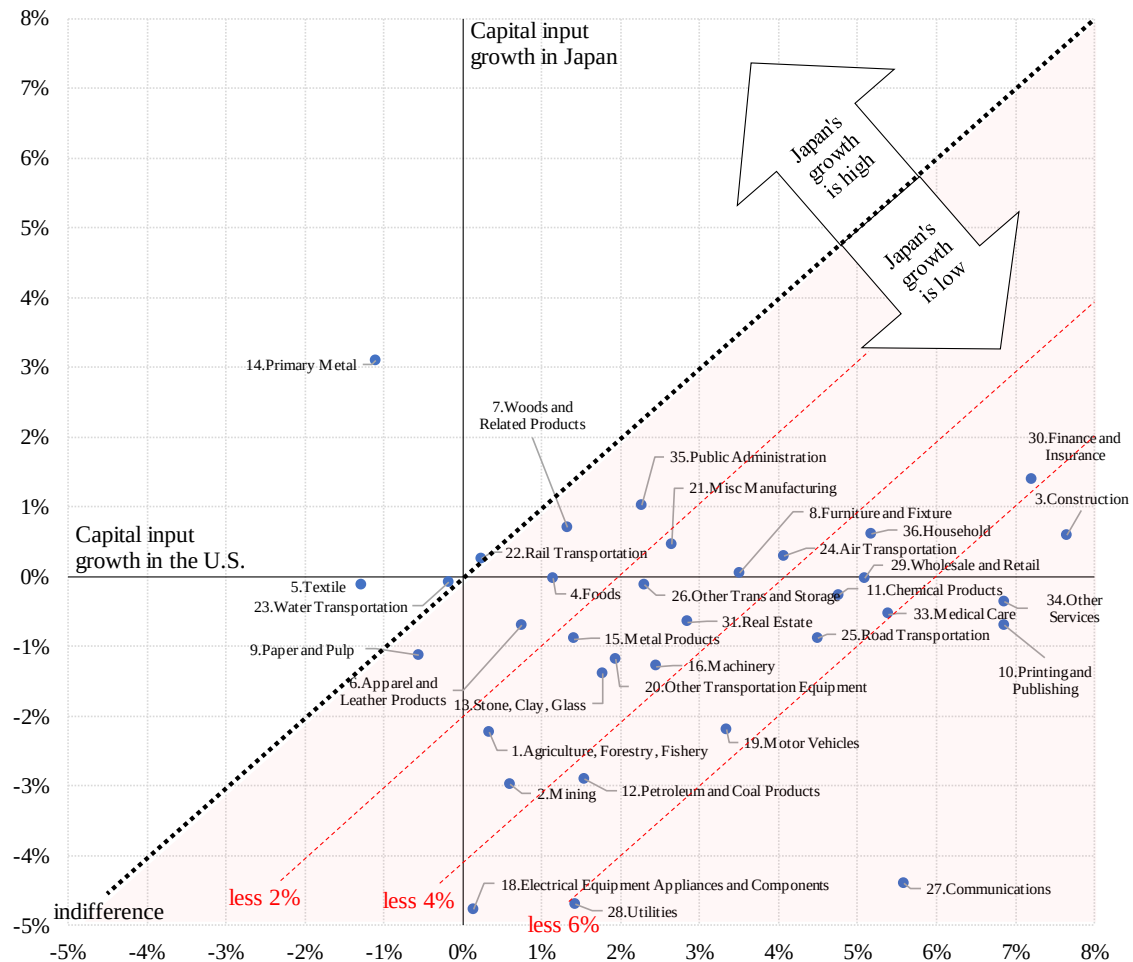


Figure 7. Stagnant capital accumulation in Japanese industry, 1995-2007

Note. Growth rates are defined as annual averages.

Data Source. Updated estimates from Jorgenson, Nomura, and Samuels (2016).

New technologies, many of which are embodied in capital goods, are incorporated into the economy via capital accumulation. In principle, these advances embodied in the capital are measured as an augmentation of capital input (Jorgenson, 1966). However, this may not be fully captured. For example, yield and energy efficiency gains by using new capital goods are not necessarily measured in terms of capital input. The investing entities may reap the benefits of the latest technology even without intentions. Own-account production of retrofitting machines that embody new technologies is often an opportunity to increase productivity, e.g., significantly in the semiconductor industry. In this sense, further investment is considered to have an external effect, which leads to an increase in TFP. Thus, the overall slump in Japan's domestic investment led to a stagnation of its TFP.

Figure 8 shows the rate of return on capital (including land and inventory) in the Japanese economy, measured in nominal and real terms (Note 11). In nominal terms, the rate of return on capital in the Japanese economy has declined drastically since the collapse period of the bubble. Naturally, companies would refrain from new investments in this context. However, when we look at the real rate of return on capital, we see that investment continued to contribute to Japan's productivity after the bubble collapse as it had before. The bubble was responsible for this, but intensive efforts to terminate it were so strong and so long that it deprived the Japanese economy of a valuable opportunity to increase productivity in order to revive the rising sun.

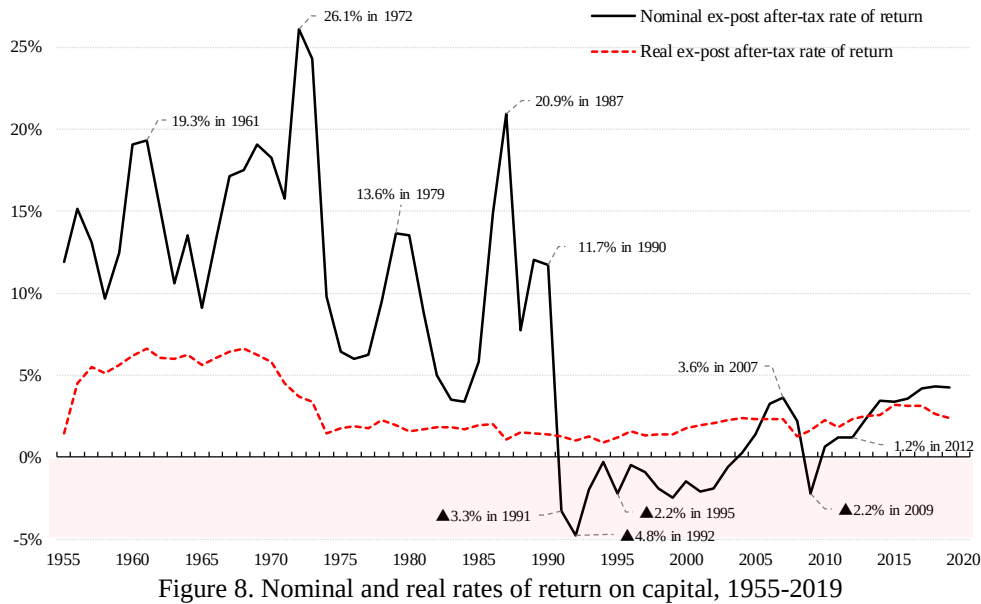


Figure 8. Nominal and real rates of return on capital, 1955-2019

Note. See Note 11 for the measurement of the rate of return on capital.

Data Source. Updated estimates from Nomura (2004) and Jorgenson and Nomura (2005).

After 1990, Japan reversed its position from one of the most productive countries in the world to one of the least productive among advanced industrial nations. Figure 9 compares TFP levels between Japan and the U.S. From 1995 to 2007, when the yen was recovering, the Japan-U.S. TFP gap worsened another five percentage points from -6%, mainly due to the decline in TFP in the manufacturing sector. During the term of BOJ Governor Shirakawa (in office from April 2008 to March 2013), the aggregate TFP worsened again by about five percentage points by 2012, mainly due to the deterioration in the service sector.

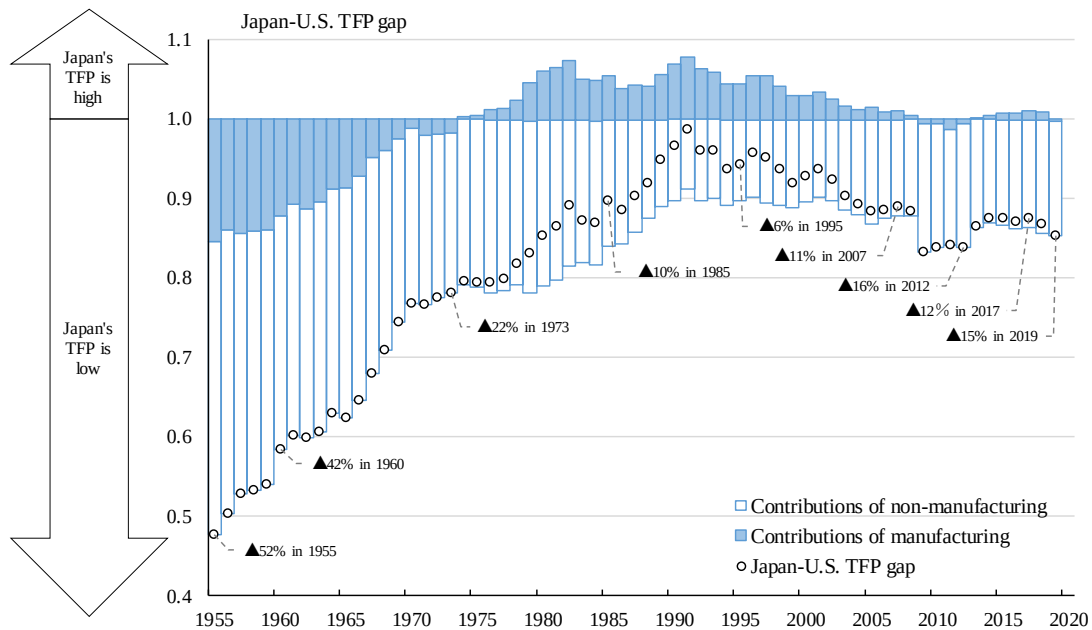


Figure 9. TFP gap between Japan and the U.S., 1955-2019

Note. The U.S. level is defined as 1.0 for each year.

Data Source. Updated estimates from Jorgenson, Nomura, and Samuels (2016).

According to traditional economics, a country's aggregate demand is determined by the quantity of money and nominal factors, while the real supply and demand of goods and services determine aggregate supply. Thus, while monetary factors determine price fluctuations in the short run, a country's long-run economic growth path is considered to be independent of monetary policy. It has been a common belief in economics that money is neutral in the long run. However, as shown in Figure 9, the experience of Japan's transition from a high-pressure economy to a low-pressure economy may strongly suggest that nominal factors are likely to have also stalled technological progress.

The reason why we observe the non-neutrality result opposite to the traditional view could be explained as follows. After the bubble burst, Japan experienced low-pressure economic deflation (Figure 5), and the nominal rate of return on capital (Figure 8) declined across the board. We ask the readers to do the following thought experiment: Suppose that investors follow the nominal rate of return instead of the real rate of return, as behavioral economics may preach. Then investment in Japan would generally stall (Figure 7). The outward investment appeared to be more attractive to Japanese companies. However, when one looks back cool and measures the real rate of return afterward, investment in Japan has maintained a certain real rate of return, albeit lower than during the period of the weak yen or the high-pressure era.

Therefore, after the bubble, investment in Japan should have yielded a reasonable real rate of return. However, because the BOJ's bubble busting was so effective, domestic and foreign investment in Japan, a deflationary country, rapidly decreased and stayed flat. The prolonged decline in real investment robbed Japan of its ability to recover.

6. How to Realize a High-Pressure Economy

Under the low-pressure economy, as Figure 8 shows, the beneficial domestic investment will be foregone, and the development of manufacturing technology, which had been Japan's forte, will not be possible. Then, how can we achieve a high-pressure economy?

The first lesson from this paper is to avoid a level of yen appreciation where the output price differential is significantly higher than one to prevent excessive wage-cut and reduction of employment. As Figure 3 shows, the BOJ has repeatedly conducted a monetary policy that allows a strong yen and has tacitly allowed the nominal rate of return on capital to become negative in Japan. Even when the yen is at its current low level, if firms expect it to appreciate again eventually, they will hesitate to expand domestic production. For the Japanese economy, preventing a strong yen is a necessary and sufficient condition for the high-pressure economy. After Prime Minister Shinzo Abe and BOJ Governor Haruhiko Kuroda successively prevented the yen from (over) appreciating and creating 5 million new jobs (Abe & Hamada, 2022), we never understand the so-called "bad low-yen theory," which ignores the lessons of three-quarters of a century of postwar Japan and criticize Governor Kuroda's monetary policy.

Let us consider Europe. Germany has enjoyed the benefits of the single currency, the euro, because the reunification of the East and the West occurred in the same year the euro was established. The persistently high dependence on exports, which is exceptional among the largest economies, can be attributed to the depreciation of the real currency. The International Monetary Fund assessed Germany's exchange rate as undervalued by 10% to 20% in 2003 (IMF, 2016). The German exchange rate has been undervalued to date. This is another example of the merit of a high-pressure economy. The experiences of overvalued exchange rates in major European industrialized countries have been at most 20-30%, and they have never reached a currency appreciation as large as Japan's in 1995 in the last half-century.

Readers may say a booming economy is good, but inflation is a problem. But since the BOJ has almost always been eager to fight inflation, should we worry about a low-pressure economy for the time being?

How can we make a moderately high-pressure economy right? Monetary expansion can improve the domestic economy under a floating exchange rate system if world markets are not in a prolonged period of zero or negative interest rates and long-term stagnation. The impact of monetary expansion in other countries would hurt the output of the home country under a floating exchange rate. But this can be overcome only if the home country expands more than it does. Since the Lehman crisis, many countries have been developing monetary expansion at will and depreciating their currencies, which has caused the yen to appreciate against other currencies. Because the BOJ did not respond with sufficient monetary expansion, the Japanese economy suffered more than the epicenter of the Lehman crisis in the U.S., U.K., Europe, etc. (Hamada & Sakurai, 2022; Abe & Hamada, 2022).

Then came the Abe administration and BOJ Governor Kuroda, who, under the banner of quantitative easing,

achieved remarkable results in restoring employment from late 2012 to 2015. Since 2016, however, the financial markets have been in a state of long-term stagnation, with interest rates at zero. It has become increasingly difficult for countries to achieve economic recovery through monetary policy alone.

Very recently, the yen depreciated substantially after 2022, caused by the dollar's strength after Covid. The demand for money under Covid and perhaps the geopolitical instability like Ukraine appreciated the dollar and depreciated the yen. In the past year, Japan returned to a high-pressured, cheap-yen economy. The only caveat was that by the lag of the J-curve effect, the inexpensive yen has not yet been effective as the upper pressure of prices and wages in Japan.

The second measure required, then, is fiscal expansion. A weaker yen can be achieved in the normal economic model by making monetary expansion competitive with other countries. However, under zero or negative interest rates, monetary policy will be limited, and fiscal expansion will play a more important role. Therefore, when fiscal expansion is likely to raise interest rates and suppress private-sector demand for funds, monetary policy can adjust the economy well, for example, with the yield curve control, which manipulates the long-term interest rate guidance target. In this case, Lerner's functional finance principle is right that government deficits have no bearing on the welfare of the people as long as they do not increase a country's foreign debt or create inflation loss. For future citizens, how much the government borrows from domestic residents borrows is solely a distributional relationship between the government and the people. The debt level is absolutely not related to welfare or the future generation.

As a caveat, one must be aware of the quality of public finances and the risk of wasteful spending. Even if the public expenditure creates temporary demand, it distorts the allocation of private sector resources, and companies in over-assisted sectors may lose competitiveness as the banquet ends. It is not easy to expect governments to spend in the right areas and in the right way. If the demand for sectors decay, the productivity that has generated value will disappear like a mirage. The fiscal stimulus that increases productivity risks could further drag the Japanese economy in the medium to the long term.

Tax cuts should be the major instrument of fiscal policy. Although tax cuts have a smaller direct demand than the increase in fiscal expenditure in a certain macroeconomic model, they can avoid productivity risks by correcting without distortions from the autonomy of the private sector. Fiscal stimulus to a specific sector must be undertaken with careful recognition of the exact challenge in each sector.

7. Conclusion

In this paper, we showed the pressure of the excessively strong yen in 1995, when the Japan-U.S. production price gap reached an all-time high and was sustained until 2007. The high-yen pressure forced the Japanese economy to lower domestic wages, also a source of the deflationary pressure that plagued the Japanese economy for a long time. Moreover, a high-pressure economy that protects the Japanese economy from a strong yen and keeps it mildly inflationary could have prevented short-term employment declines and helped improve productivity over the long term.

After 2008, the Japanese economy was again the victim of the excessively strong yen (Figure 1). It was after Covid that the yen became cheaper. Even though Abenomics stopped the decline in nominal wages (the upper chart of Figure 5) and improved the nominal rate of return on capital (Figure 8), the relative prices of labor and capital in the Japanese economy did not start to rise until after 2018 (the bottom chart of Figure 5). Nevertheless, the TFP gap between Japan and the U.S. has widened again since the same period (Figure 9), which calls into question Japan's industrial policy's inefficient allocation of resources. There is also a great concern about inducing further inefficiencies in decarbonization and economic security. Creating an environment where firms can return to domestic production will not be easy.

Despite many challenges, the Japanese economy has growth potential. Some companies that have expanded overseas now realize the excellence of their domestic human resources due to the repeated troubles they have experienced in their overseas operations. If the relative capital-labor price rises more strongly under a high-pressure economy, labor-saving capital investment is expected to expand and recover the healthy growth trajectory. Japan's low wages, suppressed for a long time (Figure 1) and quite exceptional among major economies, are also storing energy for another catch-up round.

References

- Abe, S., & Hamada, K. (2022, February). Minkan no Chie ga Unda Abenomics no Seikou (Abenomics Success Born of Private Sector Wisdom). *Seiron*. Tokyo: Sankei Shimbun. (in Japanese).
- Hamada, K., & Sakurai, M. (2022). A Return to International Policy Coordination in the Age of Secular

- Stagnation. *International Journal of Economic Policy Studies*, 16, 371-388. <https://doi.org/10.1007/s42495-022-00089-2>
- IMF. (2016, June 29). Germany: 2016 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Germany. *IMF Country Report*, 16/202. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781498333979.002>
- Ito, T. (2022, March 3). Why is Japan So Cheap? *Project Syndicate*. Retrieved from <https://www.project-syndicate.org/commentary/japan-weak-productivity-low-real-effective-exchange-rate-by-takatoshi-ito-2022-03>
- Ito, T., Isard, P., & Symansky, S. (1999). Economic Growth and Real Exchange Rate: An Overview of the Balassa-Samuelson Hypothesis in Asia. In T. Ito, & A. Krueger (Eds.), *Changes in Exchange Rates in Rapidly Developing Countries—Theory, Practice, and Policy Issues* (Chap. 4). Chicago: University of Chicago Press. Retrieved from <https://www.nber.org/papers/w5979>
- Jorgenson, D. W. (1966). The Embodiment Hypothesis. *Journal of Political Economy*, 74(1), 1-17. <https://doi.org/10.1086/259105>
- Jorgenson, D. W. (2018). Production and Welfare: Progress in Economic Measurement. *Journal of Economic Literature*, 56(3), 867-919. <https://doi.org/10.1257/jel.20171358>
- Jorgenson, D. W., & Nomura, K. (2005). The Industry Origins of Japanese Economic Growth. *Journal of The Japanese and International Economies*, 19, 482-542. <https://doi.org/10.1016/j.jjie.2005.05.002>
- Jorgenson, D. W., Nomura, K., & Samuels, J. D. (2016). A Half Century of Trans-Pacific Competition: Price Level Indices and Productivity Gaps for Japanese and U.S. Industries, 1955-2012. In D. W. Jorgenson et al. (Eds.), *The World Economy—Growth or Stagnation?* (Chap. 13). Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781316534502.013>
- Kiyotaki, N., & Moore, J. (1997). Credit Cycles. *Journal of Political Economy*, 105(2), 211-248. <https://doi.org/10.1086/262072>
- Nomura, K. (2004). *Shihon no Sokutei: Nihon Keizai no Shihon Shinka to Seisansei (Measurement of Capital: Capital Deepening and Productivity in Japan)*. Tokyo: Keio University Press. (in Japanese).
- Nomura, K., Miyagawa, K., & Samuels, J. D. (2019). Benchmark 2011 Integrated Estimates of the Japan-U.S. Price Level Index for Industry Outputs. In B. M. Fraumeni (Ed.), *Measuring Economic Growth and Productivity—Foundations, KLEMS Production Models, and Extensions* (Chap. 12). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-817596-5.00012-3>
- Okun, A. M. (1973). Upward Mobility in a High-pressure Economy. *Brookings Papers on Economic Activity*, 1. <https://doi.org/10.2307/2534087>
- World Bank. (2020). *Purchasing Power Parities and Real Expenditures of World Economies: Summary of Results and Findings of the 2017 International Comparison Program*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1530-0>
- Yellen, J. L. (2016, October 14). Macroeconomic Research After the Crisis, at The Elusive ‘Great’ Recovery: Causes and Implications for Future Business Cycle Dynamics. 60th Annual Economic Conference Sponsored by the Federal Reserve Bank of Boston. Boston, Massachusetts. Retrieved from <https://www.federalreserve.gov/newsevents/speech/yellen20161014a.htm>

Notes

Note 1. The International Comparisons Program (World Bank, 2020) develops the PPPs for final expenditures at purchaser prices. One of the main obstacles to international productivity comparison is the need for adequate PPPs for *outputs* and *intermediate inputs* across countries. Nomura, Miyagawa, and Samuels (2019) developed these estimates based on 173 industry classification between Japan and the U.S. These results provide one of the bases for the measurements in this paper.

Note 2. Conceptually, output PLI equals the inverse of the *real exchange rate*. While the analysis in this paper using PLI based on detailed bilateral accounts has a huge advantage of consistently understanding such changes along with changes in productivity and factor input prices (Section 4), it has the analytical limitation of lacking a multilateral comparison perspective on exchange rates. However, from the perspective of a multilateral comparison that considers the effects of exchange rates other than the Japan-U.S. rate, the trends in Figure 1 are

generally similar in the Japan-U.S. relationship based on the *real effective exchange rate*.

Note 3. Under this exchange rate, the PLI for labor input (hourly wage) was only about 20-30% of the U.S. level (Figure 1). This was a source of price competitiveness, compensating for inefficiencies caused by Japan's TFP inferiority, which was about half that of the U.S. at the time (Figure 7).

Note 4. "Plaza Accord: 30 Years Later, Tomomitsu Oba (Former Vice-Minister of Finance for International Affairs) and Toyoo Gyōten (Former Director-General of the International Finance Bureau of the Ministry of Finance)," September 22, 2003, Tokyo: Sankei Shimbun.

Note 5. Surprisingly, the current level (as of March 2023) is about 30% below that peak.

Note 6. Another advantage of the measurements in this paper is that it considers the Japan-U.S. differences in industrial structure on the output side and capital and employment structures on the input side. The Japan-U.S. bilateral production account ranks ninth out of 12 major progresses in economic measurement in Jorgenson (2018, Table 3).

Note 7. About sixty percent of this reduction (16 percentage points) is due to decreased labor costs for non-college graduates, as shown in the left chart of Figure 3.

Note 8. Abenomics refers to the economic policies implemented by the Government of Japan led by Prime Minister Shinzo Abe since the December 2012 general election.

Note 9. While the average land price in a country's economy should be viewed with a wide margin of error, the land price for commercial use in Japan declined an average of 7.9% per year (4.5% for industrial use) in 1995-2007, an acceleration from the 7.4% (2.3%) decline in 1991-1995 and well above the 2.8% (2.7%) decline during the subsequent downturn (2007-2016).

Note 10. The intra-industry effect reflects the changes in employment cross-classified into two groups by gender, four groups of educational levels, 11 groups of age, and five employment status groups within the industry.

Note 11. The real rate of return is the nominal rate minus the capital gains (or losses) term, which reflects the change in asset prices. The return on capital is the aggregate from the nominal weighted-average after-tax rates of return on capital estimated for 46 industries, based on 158 assets (including land and inventory) and the detailed tax system of the Japanese economy. See Nomura (2004, Chapter 3) and Jorgenson and Nomura (2005, Section 3) for further discussion.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).