

A Comparative Study on the Two-Way Movement of Exchange Rate between Japan and South Korea and the Toughness of Industrial Structure

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Abstract. At present, the global financial turmoil has intensified, and the exchange rate has become the core variable affecting open economies. Under the background that Japan and South Korea are at similar historical lows due to the impact of fluctuating exchange rates, this paper mainly analyzes the different industrial structures of the two countries under the impact of large-scale exchange rate shocks, and explores the two-way relationship between exchange rates and industrial structure resilience through the differences and similarities between the two countries' different industrial structures and measures to deal with exchange rate shocks under the similar two-way relationship. Taking Japanese automobile enterprises and the Korean semiconductor industry as examples, this paper carries out a historical study to supplement the one-way relationship between the traditional exchange rate and the industry, and proves the two-way movement relationship between them. Finally, through the innovation and supplementary research on the two-way relationship between industrial structure and exchange rate at the same time, it can provide reference for emerging export-oriented economies that are also facing the impact of exchange rate.

Keywords: Japan and South Korea, exchange rate, industrial structure, automobile, semiconductor

1. Introduction

In recent years, the Japanese yen and the Korean won have fallen to historical lows simultaneously, but the industrial performance of the two countries has been divided: Japan has fallen into a "devaluation recession" cycle, South Korea's semiconductor has ushered in a super cycle, while the traditional industry has been depressed, showing a "K-type differentiation".

The traditional theory of devaluation promoting exports is difficult to explain. The key is that there is a two-way movement between the exchange rate and industry - the decline of industry exacerbates devaluation, and devaluation raises import costs to curb upgrading. The existing studies focus on the one-way impact of exchange rate and lack a unified framework. Based on the two-way exchange rate between Japan and South Korea, this paper compares the differences in the toughness of industrial structure between the two countries, and provides reference for emerging export-oriented economies.

Existing studies have laid a foundation for understanding the relationship between Japan and South Korea's exchange rate and Industry: there is a nonlinear correlation between the exchange rate of the yen and the won [1]. South Korea's "k-semiconductor strategy" and Japan's "materials+equipment" implicitly explain semiconductor differentiation [2]. The exchange rate and the transformation of new energy have brought double pressure to the automobile industry, and the transformation of Korean automobile enterprises is faster [3, 4]. The Korean won exchange rate is positively correlated with semiconductor exports [5]. The deviation of interest rate parity in Japan reveals the exchange rate driving mechanism [6]. Korean traditional semiconductor and chemical profit differentiation confirm "K-type differentiation" [7, 8]. The digital economy competition between China, Japan and South Korea provides a regional background [9, 10]. However, the research on bringing policy tools, exchange rate and industry into a unified framework is limited, so this paper further studies the relationship between the resilience of industrial structure and the two-way movement of exchange rate in Japan and South Korea.

2. Development history of Japan South Korea exchange rate and industrial structure

2.1. Evolution of industrial structure toughness under the two-way movement in Japan

2.1.1. Historical fluctuation trajectory of Japan's exchange rate

Starting from the Plaza Agreement in 1985, the yen doubled against the US dollar in three years, weakening Japan's export competitiveness, and then continued to appreciate to the historical high in 1995. Since then, the Asian financial crisis, the bursting of the Internet bubble, the global financial crisis in 2008 and the European debt crisis have repeatedly triggered a sharp decline and rise in the yen.

In the past decade, Abenomics has promoted the Bank of Japan to ease on a large scale, and the yen has depreciated significantly; The widening interest rate gap between the United States and Japan pushed it into a historical depreciation cycle, and the real effective exchange rate fell to the lowest level since the floating exchange rate system in 1973.

During the depreciation cycle from 2024 to 2026, the traditional risk-averse attribute of the yen "broke anchor" - the yen plummeted when geopolitical risks in the Middle East rose, and the market began to price the structural vulnerability of Japanese energy. It can be seen that under the impact of the global exchange rate, the yen's safe-haven status has gradually exposed the multiple structural fragilities of Japan's fiscal, energy and industrial structure.

2.1.2. Industrial structure adjustment under the pressure of yen appreciation

After the Plaza Accord, the yen appreciated sharply, and the price competitiveness of a large number of Japanese export enterprises was severely squeezed. In order to cope with this situation, Japanese enterprises were forced to do two things: one was to transfer their production bases overseas, and the other was to upgrade to high-value-added products.

The adjustment during this period was simply "forced to upgrade" appreciation pressure eliminated a large number of low-value-added industries.

The surviving enterprises have either transformed or moved their factories overseas, just as the United States used Japan and South Korea as production bases for low-value-added semiconductors in the 1980s to reduce costs and expand profits, so these surviving enterprises generally have strong non-price competitiveness.

Later, Japanese enterprises were overtaken by South Korea in the DRAM field and turned to semiconductor equipment and materials, such as Tokyo Electronics, Shinyue Chemical and Sumco, which formed a global monopoly in their respective segments. This transformation has shifted Japan's industrial structure from scale to technology, and the sensitivity of exchange rates has also decreased. With the gradual establishment of technical barriers by Japanese enterprises in the high-end manufacturing field, the price elasticity of demand for export products has decreased. At this time, the behavior of "pricing to market" (PTM) began to appear - when the exchange rate changes, enterprises give priority to stabilizing the export price rather than adjusting the sales volume.

For example, Honda, Toyota, Nissan and other auto companies built factories in North America, Europe and Asia on a large scale in the 1980s and 1990s. Hitachi, Panasonic and other electronics enterprises also transferred their production to countries with lower costs. At first, this move was to hedge against the pressure of appreciation, and then gradually became the infrastructure of exchange rate risk management. Therefore, although the pressure of yen appreciation has brought short-term difficulties and pressure to exports, it has also been promoting Japan to strengthen its industrial structure toughness - forcing enterprises to shift from price competition to technology competition, and from local production to global layout. The core feature of this model is that it has completed the transformation from "export dependence" to "global operation" in the process of currency appreciation.

2.2. The evolution of industrial structure toughness under the two-way movement in South Korea

2.2.1. Historical fluctuation trajectory of won exchange rate

From the perspective of the fluctuation of the Korean won exchange rate, its range of change is greater than that of the Japanese yen, and it is highly related to the external crisis. In 1997, the IMF Crisis broke out in South Korea (named after asking for help from the International Monetary Fund), which was rooted in the structural defects of the chaebol economy and the impact of the Asian financial crisis. The won plummeted from about 850 to nearly 2000 won/US dollar. Since then, South Korea has accepted the IMF's \$58billion bailout and austerity reform.

By the end of 1999, it had weathered the crisis, and the won had gradually appreciated steadily. In 2008, the financial crisis and the subsequent epidemic hit the won again. In the past decade, the won has been repeatedly devalued and slowly appreciated. In the 25-26 years, semiconductor industries such as Samsung and SK Hynix led the won to rise and boosted the stock market. Throughout the study period, the won does not have the risk aversion attribute of the yen. It tends to depreciate during the crisis and is highly sensitive to global risk sentiment. Therefore, South Korea is known as the "Canary economy". This feature shapes the basic logic of South Korea's "adjustable toughness". Unlike Japan, South Korea has a lighter debt burden, no central bank fiscal problems, and greater flexibility in monetary policy.

2.2.2. Resilience evolution of semiconductor industry in the two-way movement of exchange rate

Semiconductors account for nearly 30% of South Korea's exports, and they are particularly sensitive to the exchange rate: the income is in US dollars, but the cost is tied to imported equipment and materials. Short-term benefits and long-term pressure squeeze caused the core contradiction of exchange rate flexibility. During the devaluation, the dollar income increased in exchange for

Korean won, and the profit rose rapidly. However, only large enterprises such as Samsung Electronics and SK Hynix with technology premium and pricing power can retain earnings. However, small and medium-sized enterprises are highly dependent on imports. A devaluation of the Korean won will reduce profits, and a rise in the price of equipment imports will also reduce earnings and push up the cost of overseas investment in US dollars in the future.

But in the appreciation cycle, the situation is different.

At the beginning of 2026, the won rebounded, and the nominal growth rate of semiconductor exports was suppressed by the exchange rate translation effect; Excluding semiconductors, the growth rate of South Korea fell from 1.8% to about 1.4%, so the toughness of semiconductors is not equal to the toughness of the overall economy. What really depends on is technological competitiveness. Taking the lead in the field of high bandwidth memory, coupled with the supply chain tied to global technology giants, Korean enterprises have the right to price. Instead of relying solely on the exchange rate to get orders, they rely on technological upgrading and transformation to high added value to enhance their irreplaceable value. This is in contrast to Japan's traditional automobile industry: the latter's advantages have been gradually eroded in the process of electric transformation, and the previous exchange rate hedging is not very effective. But this toughness has boundaries, and the high degree of export concentration is equivalent to turning the South Korean economy into an amplifier to observe the global science and technology cycle.

Once the tide of AI investment ebbs or the technological paradigm shifts, the existing hedging capabilities will soon become ineffective. The exchange rate toughness represented by semiconductors in South Korea has several characteristics: the benefits gained in the devaluation period are greater than the losses in the appreciation period; Highly dependent on the upward cycle of global science and technology and its leading position in technology. The semiconductor boom has led to the phenomenon of "one industry dominating and K-type differentiation". In the long run, this will have a negative impact on the industrial structure of South Korea.

2.3. Comparative analysis

Theoretically, Japan and South Korea are both export-oriented countries, but the import scale and position in the global value chain are different, leading to their respective difficulties. Compared with Japan, the semiconductor industry in South Korea has the advantages of healthier finance, greater monetary policy space and more flexible adjustment. But it is also more dependent on the global science and technology cycle.

This leads to an open question: will South Korea repeat the mistakes of Japan's auto industry when semiconductors face new technological paradigms? The lesson of Japanese auto companies is that exchange rate hedging cannot replace the reconstruction of product competitiveness. Once the industry encounters structural disruption, the exchange rate advantage will sooner or later be replaced by the systematic contraction of demand. Most of Japan's industries are in the upper reaches, and the manufacturing capacity of parts is very strong. It is reasonable to say that the more development, the weaker dependence on imports should be.

But the actual situation is just the opposite - things like machine tool materials and chip precursors are more difficult to replace for the top upstream Japanese industries, so the impact of the devaluation of the Japanese dollar is relatively large. Korean industries are mostly in the downstream, and the import demand for Japanese-made parts is not small, but it can be buffered by adjusting the supply chain, such as purchasing from other countries.

Moreover, South Korea's main export products - memory chips, smartphones, and cars- have relatively stronger pricing power in the global market. With costs rising, Korean enterprises can

transfer part of the pressure to consumers. For example, Samsung and SK Hynix raised their prices due to the strong demand for AI chips in 2025. On April 30, 2026, the scale of the Japanese authorities' single intervention in the foreign exchange market reached 5.4 trillion yen, which was one of the largest single interventions in history. It is worth noting that the intervention was also suspected of selling crude oil futures - an operation never seen in the Korean industry. This shows an important fact: Japan's exchange rate policy is not just a tool for trade competitiveness, but is deeply tied to the energy security strategy. When the depreciation of the exchange rate threatens the energy import capacity, the purpose of intervention has changed from "supporting exports" to "ensuring survival".

3. Reasons for differences between Japan and South Korea's industrial structure and exchange rate

Based on the above analysis, there are three main differences between the two countries: resource endowment, industrial structure and policy space. In terms of policy space, Japan's foreign exchange reserves are huge, and South Korea's are only one-third of them. Therefore, South Korea is more cautious and conservative in dealing with the exchange rate, and its goal is not to dominate the direction of the exchange rate, but to mitigate fluctuations as much as possible. On the whole, Japan is in a structural dilemma: the contradiction between the lack of resources and the upstream position of the industry has turned the devaluation from the past "competitive advantage" to "cost disaster".

In contrast, South Korea, relying on its more flexible industrial chain positioning and limited policy space, has shown greater resilience under the impact of the same exchange rate. The industrial circles of the two countries do not passively accept the exchange rate, but actively participate. The intervention of the Japanese authorities above shows that the demands of enterprises have expanded from "exchange rate stability" to "energy security protection".

In the fourth quarter of 2025, the Bank of Korea sold a net \$1.745 billion to prevent the rapid depreciation of the won. Compared with Japan's intervention of Japan, South Korea is more conservative. So what the industry wants is not simply "currency devaluation". Under the relative shortage of resources, Japanese and Korean industries are more concerned about the "controllability" and "predictability" of exchange rate fluctuations than a specific exchange rate level. This point corrects the traditional assumption that "export enterprises always like weak currencies".

4. Conclusion

About the impact of the low level of similar exchange rate fluctuations and the differences in industrial structure and industrial chain position between the two countries, it further explains that the relationship between industry and exchange rate is not only the one-way relationship between the latter and the former, but also the two-way impact. Finally, I will make suggestions and Enlightenment for the two countries based on the existing data.

First of all, I believe that Japan should incorporate its exchange rate policy into the resource security framework, accelerate energy transformation, restart nuclear power, and expand renewable energy. The second is to reduce the dependence on LNG. The government and enterprises take the initiative to promote industrial upgrading to get rid of the dependence on devaluation, decouple subsidies from the exchange rate, and turn to high value-added technologies. Finally, the government should improve the relevant rules to regularize the intervention, such as setting a clear fluctuation threshold to reduce sudden intervention.

South Korea should decentralize the distribution of supply chain to reduce its dependence on Japanese precision parts. Moreover, the government should expand its foreign exchange reserves to prevent the arrival of the crisis in advance. And also for the relevant government measures, should improve the transparency of intervention, such as the disclosure of intervention data, the establishment of institutionalized political and business consultation system, etc. In addition to the semiconductor industry, other industries should also be upgraded to high value-added industries to enhance industrial pricing power and reduce exchange rate sensitivity.

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