Comparing the Effectiveness of the Monetary Policies in Korea and Japan

Sang-Kee Kim and Geunhyung Yim

This study conducts a comparative analysis of the monetary policy transmission channels and their effects in Korea and Japan using a sign restriction VAR model to determine whether a Japanese-style monetary policy can be implemented in Korea. Results indicate considerable differences between Korea and Japan in their monetary policy transmission channels. Conventional monetary policy transmission channels, such as the exchange rate channel, asset price channel, and bank lending channel, works relatively well in Japan. However, in Korea, the interest rate channel is effective but has only a short-term effect on the exchange rate, and the effects on asset prices and bank lending are hard to expect in general. Furthermore, some potential risks working through the housing market may hinder financial stability. Korea and Japan see a limited effect on production in the real sector. These results imply that Korea must be careful about implementing a similar monetary policy as Japan.

Keywords: Monetary policy transmission channel, Unconventional monetary policy, Shadow policy rate

JEL Classification: E43, E52, E58

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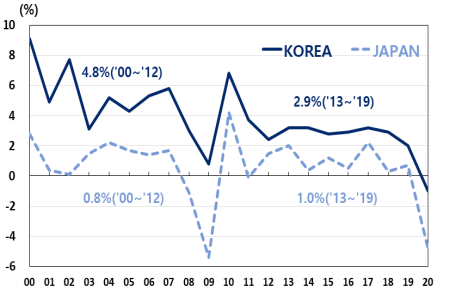
I. Introduction

The growth of the Korean economy has been slowing down since the 2000s. The employment conditions are worsening, thereby increasing the concern over the declining dynamics of the economy. Despite the cyclical economic recovery, the total factor productivity slowdown and shrinking working-age population because of population aging will lead to a constant decrease of potential growth rates,[1] thereby weakening the growth engine. Some are even worried about the "Japanification" of the Korean economy. As shown in Figures 1 and 2, the Japanese economy has maintained positive growth since the relaunch of the Abe administration at the end of 2012 until just before the recent COVID-19 pandemic, while showing a remarkable drop in the unemployment rate. Japan has overcome the long-term economic recession, referred to as the "Lost Decades," by producing positive results, such as growth recovery and job creation, breaking free from the chronic deflation (Botman *et al.* 2015; Posen 2020).

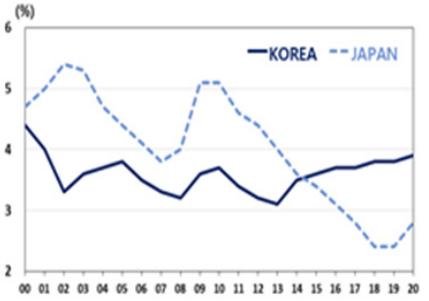
Economic policies, such as fiscal and monetary policies, aside from the fundamental economic conditions, may affect the differing economic trends in Korea and Japan. The Korean economy is recently facing



Source: Bank of Korea

Figure 1
Economic Growth Rates in Korea and Japan

[1] In August 2019, the Bank of Korea announced the estimates of Korea's potential growth rates as 5.0–5.2% in 2001–2005, 4.1–4.2% in 2006–2010, 3.0–3.4% in 2011–2015, and 2.7–2.8% in 2016–2020 (Kwon, Kim, Ji, Kim, and Noh, 2019).



Source: Bank of Korea

FIGURE 2
UNEMPLOYMENT RATES IN KOREA AND JAPAN

a continuous threat of low growth and low inflation. With a reduced capacity to manage policy interest rates, some argue for the need to expand policy space through unconventional monetary policies such as quantitative easing. Some suggest the need to apply an unconventional monetary policy in Korea similar to that of Japan given that the Japanese economy has been receiving positive feedback since the implementation of Abenomics (Lee, 2015; Yoon, 2016). Thus, this study comparatively analyzes the monetary policy transmission channels and their effects in Korea and Japan, thereby drawing policy implications on whether a similar type of unconventional monetary policy in Japan can be applied to Korea.

To review whether Japan's unconventional monetary policy can be applied to Korea, analyzing the effectiveness of the monetary policies in the two countries is first necessary. However, related studies are few. Cargill (2005) qualitatively compared the inflation situation in Korea and Japan and pointed out that Japan faced deflation, unlike Korea in the early 2000s; Korea adopted inflation targeting in 1997 and anchored the expected inflation, but Japan did not. Braun and Shioji (2006) analyzed Korea, Japan, and the US using the sign restriction VAR model. They reported that the liquidity effect hypothesis, in which an accommodative monetary policy expands the money supply and increases industrial production and prices, was not significant in Japan and the US but appeared in Korea. Lee (2014) also analyzed the monetary policies in Korea, Japan, and the US using the sign restriction VAR model and discovered that, while the effectiveness of monetary policy is decreasing in Korea, responses are quicker and clearer in the

short-term interest rate and industrial production gap toward monetary policy shocks than in the US and Japan. Unlike the two aforementioned studies, Cha (2013) compared the monetary policies in Korea and Japan using the New Keynesian model and found that monetary policy in Korea is responsive to the output gap in monetary targeting regime and the inflationary gap in inflation targeting regime, indicating that the monetary policy worked effectively; however, in Japan, the variables had low significance and could not deem the monetary policy effective.

The present study shares common ground with Braun and Shioji (2006) and Lee (2014) because it comparatively analyzes the monetary policies in Korea and Japan using the sign restriction VAR model. However, while their studies used data from the 1990s to 2014 and examined the effects of monetary policy focusing on production, prices, and money supply, the present study uses the data from the mid-2000s to 2019, including the recent implementation of Abenomics in Japan. This study is also distinct in that it examines various transmission channels, such as exchange rates, bank lending, stock prices, and house prices. Furthermore, since the 2000s, Korea mostly used conventional tools[2] such as policy interest rate, whereas Japan depended on unconventional measures such as quantitative easing and yield curve control with its policy interest rate close to zero lower bound, which means that directly comparing the effectiveness of the monetary policies in the two countries was difficult. Another critical difference in this study compared with others is that this study uses the shadow policy rate[3] proposed by Wu and Xia (2016) and attempts to compare the effectiveness of monetary policy when two countries operate different policy measures.

The key findings of this study are as follows. The empirical analysis

[2] The Bank of Japan was the first in the world to implement forward guidance along with the zero-rate policy in February 1999 and the first to adopt quantitative easing to meet the reserve balance requirement in March 2001.

[3] After the global financial crisis, policy interest rates in the US and Euro area dropped to zero, and identifying the monetary policy stance using only policy interest rates became difficult because central banks began to adopt unconventional monetary policies such as quantitative easing. The shadow policy rate refers to an imaginary policy interest rate to identify the stance of the overall monetary policies, including conventional and unconventional monetary policies by converting various unconventional monetary policy measures, such as quantitative easing to policy interest rates.

shows that Korea has relatively greater constraints than Japan in terms of the effectiveness of its monetary policy. The effect of decreasing long-term interest rates is large, but the impact on the exchange rate is short-term, and the impact through the asset price channel and bank lending channel is hard to expect. However, if the bank lending channel is subdivided, the cut in policy interest rates leads to increased bank lending to households, thereby inducing increased stock prices and industrial production to a certain extent but possibly followed by soaring house prices. Despite the differing effectiveness, monetary policy in Korea and Japan shows limited success in boosting the real economy, contrary to the results of previous studies claiming that Korea's monetary policy was more effective than that in Japan.[4]

This study is organized as follows. First, Section II briefly examines the possibility that Korea and Japan have different monetary policy transmission channels. Section III presents the results of the empirical analysis. Section IV summarizes the results and discusses the policy implications based on the results.

II. Monetary policy transmission channels in Korea and Japan

Before empirical analysis, this section briefly discusses the possibility that Korea and Japan have different monetary policy transmission channels. In general, monetary policy is considered to affect the real

[4] Studies that individually analyzed the monetary policies in Korea and Japan also stated that the effect of monetary policy in Korea is weakening, and monetary policy in Japan severely lacks effectiveness. For example, Kim and Jun (2017) estimated the monetary policy effect in Korea before and after the global financial crisis and concluded that, after the financial crisis, the effect of monetary policy decreased, and reaching the maximum effect took more time to reach. Furthermore, Kim (2018) used the mixed innovation TVP-VAR model and analyzed the structural changes in the monetary policy transmission mechanism in 1987–2016; he found that the effect of monetary policy on production and inflation tended to weaken toward recent times. In Japan, Yoshino and Taghizadeh-Hesary (2014) used a weighted two-stage least squares analysis and determined that Japan's inflation rate in Q1 2002–Q2 2014 was significantly influenced by high oil prices because of the weak yen rather than the GDP gap (economic recovery), and long-term real interest rates had no significant effect on aggregate demand during the same period. Thus, monetary policy did not have a strong impact on this trend.

economy and financial market through the interest rate channel, bank lending channel, asset price channel, and exchange rate channel.[5] Considering the following, the interest rate channel, exchange rate channel, and stock market channel are likely to operate more weakly in Korea than in Japan. The housing market channel is expected to operate more strongly in Korea. For the bank lending channel, bank lending to households is more important in Korea, whereas bank lending to businesses is more important in Japan.

A. Interest rate channel

First, the interest rate channel through which the adjustments in policy interest rates are transmitted to the short- and long-term market interest rates and loan and deposit interest rates operates smoothly in Korea (Bank of Korea 2017).[6] In Korea, the short-term market interest rates generally decrease right after the policy interest rates drop to the level of the decrement or a little bit higher, and the long-term market interest rates and bank loan and deposit interest rates also decrease considerably. However, the central bank's control over long-term interest rates is likely to be more limited in Korea than in Japan because external factors have a considerable impact on the term premium in Korea because it is a small open economy. Previous studies, such as Kim and Oh (2015) and Ha and So (2017), have claimed that

[5] Many recent studies have pointed out that the unconventional monetary policies transmit to the financial market and real economy in quite different manners from those of the conventional monetary policies (e.g., signaling channel and portfolio channel). However, for the comparison of the monetary policies in Korea and Japan, this study focuses on the traditional transmission channels, such as interest rate channel, exchange rate channel, asset price channel, and bank lending channel. This study also considers that the various non-traditional policy measures by the Bank of Japan, including liquidity support for banks, negative interest rates, the purchase of long-term government, and corporate bonds, and the purchase of ETFs are implemented through the credit market, bond market, and stock market. Studying further how the unconventional monetary policy works through signaling channel and portfolio channel is worthwhile.

[6] Japan implemented the zero rate policy in February 1999, changed its operational target of monetary policy from a call rate to reserve balance requirement in March 2001, and implemented the yield curve control policy in September 2016; thus, identifying the interest rate channel of the monetary policy explicitly since the 2000s is difficult.

foreign factors significantly impact the formation of long-term interest rates in Korea.[7]

B. Exchange rate channel

The exchange rate channel may also be weaker in Korea than in Japan. First, external factors such as the business cycle of the world economy, global liquidity conditions, and uncertainty in the international financial market have a significant influence on exchange rates because Korea is a small open economy (Yoo 2011). Moreover, considering the structure of the foreign currency funds flowing into Korea, an expansionary monetary policy is likely to increase inward foreign portfolio investment. Korea has a high ratio of stock investments among foreign currency funds;[8] thus, if implementing an expansionary monetary policy leads to an increase in stock prices, it may lower exchange rates, unlike the traditional theory (Kim & Yoo 2001; Lee and Yoo 2006).[9] As shown in Figures 3 and 4, the relationship between the internal and external interest rate differential and exchange rate from 2004 to 2019 show that the KRW/USD exchange rate had correlations of 0.31 and 0.25 with the short- and long-term interest rate differential, respectively. However, the JPY/USD exchange rate had correlations of −0.58 and −0.66 with the short- and long-term interest rate differential, respectively, indicating that lower interest rates were accompanied by won appreciation in Korea and yen depreciation in Japan.[10] The size of

[7] Kim and Oh (2015) used the dynamic Nelson-Siegel model to estimate the yield curve factors for Korea and the US. They argued that the impact of the US yield curve level on the Korean yield curve level increased remarkably since the global financial crisis. Furthermore, Ha and So (2017) built a structural VAR model that reflected external and internal factors and documented that external factors had a crucial role in determining the long-term interest rates in a small open economy, such as the UK, Canada, Korea, and Australia.

[8] For foreign portfolio investment from 2004 to 2019, Korea had 21.4% loans, 26.3% bonds, and 52.3% stocks, whereas Japan had 34.1% loans, 28.3% bonds, and 37.6% stocks, showing that Korea had a remarkably higher ratio of foreign stock investments than Japan.

[9] Despite this possibility, Kim (2014) found that the upward adjustment in policy interest rates in Korea significantly decreased the KRW/USD exchange rate in the short run.

[10] The internal and external interest rate differential in this study is obtained by subtracting foreign interest rates from domestic interest rates. Therefore, the

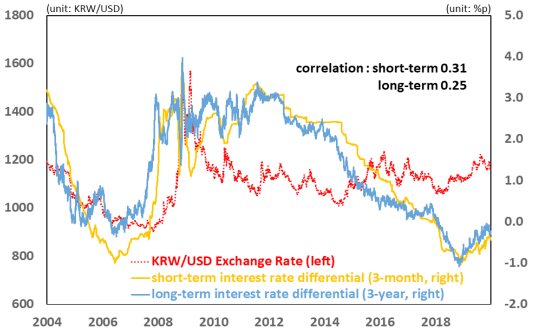
the correlation coefficients was also considerably higher in Japan than in Korea.

C. Asset price channel

Among the asset price channels, the stock market channel is likely to operate more strongly in Japan than in Korea given the difference in the role of stocks as a financing tool for firms.

Korea has a relatively smaller stock market than Japan, and firms have a low dependency on the stock market for financing, which is why the stock market cannot be expected to operate smoothly as a monetary policy transmission channel. The ratio of stocks among firms' direct financing from 2004 to 2019 is 23.3% in Japan but only 7.6% in Korea (Table 1). In Japan, stock prices increased significantly since the implementation of Abenomics compared to house prices, thereby contributing to improved financing conditions for firms and a boost in investments.

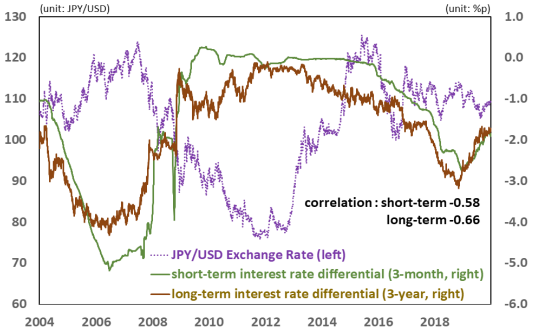
However, ruling out the possibility that the housing market channel



Note: Short-term interest rate differential is the gap between Korea's CD rate and the three-month US LIBOR rate. The long-term interest rate differential is the three-year government bond yield gap.
Source: Bank of Korea

Figure 3
KRW/USD Exchange Rate and Internal and External Interest Rate Differential

positive (negative) correlation indicates that the exchange rate falls (rises) and thus the currency appreciates (depreciates) when the country's interest rate is lower (higher) than that in other countries.



Note: Short-term interest rate differential is the gap between the three-month Tokyo interbank offered rate and the three-month US LIBOR rate. The long-term interest rate differential is the three-year government bond yield gap.
Source: CEIC

FIGURE 4
JPY/USD EXCHANGE RATE AND INTERNAL AND EXTERNAL INTEREST RATE DIFFERENTIAL

TABLE 1
COMPARISON OF THE KOREAN AND JAPANESE STOCK MARKETS
(2004-2019 average)

	No. of listed companies	Aggregate market price	The ratio of stocks in direct financing
Korea	1,899	1,190 trillion KRW	7.6%
Japan	2,861	470.3 trillion JPY	23.3%

Note: 1. Korea: Companies listed on the Korea Exchange (KOSPI, KOSDAQ, KONEX) / Japan: Tokyo Stock Exchange (TSE) 2. The ratio of stocks in direct financing is calculated as (stock issue balance)/(corporate bond issue balance + stock issue balance)×100.
Source: Korea Exchange, Japan Exchange Group

would operate in Korea is difficult. As shown in Table 2, Korea has a high ratio of real estate ownership; thus, the wealth effect of housing price fluctuations may exceed stock price fluctuations.

D. Bank lending channel

Finally, for the bank lending channel, Korea and Japan have different patterns, with Korea focused on bank lending to households and Japan

Table 2
Asset Ownership in Korean and Japanese Households

(unit: %)

	Real estate	Stocks	Cash and deposits
Korea	60.2	5.6	15.4
Japan	37.6	5.2	31.5

Note: The ratio of total household assets, 2008-2017 average.
Source: OECD

Table 3
The Ratio of Deposit Bank Loans in Korea and Japan

(unit: %)

	Korea	Japan
Bank lending to businesses	53.6	65.7
Bank lending to households	44.8	27.7

Note: 1. The numbers are 2004–2019 average. 2. The numbers for Korea cover general banks. For Japan, they cover the banks with business licenses in Japan.
Source: Korean Financial Supervisory Service, Bank of Japan

focused on bank lending to businesses. As shown in Table 3, loans by deposit banks explain this difference: such banks have a relatively higher percentage of bank lending to households in Korea and a relatively higher percentage of lending to businesses in Japan.

In Korea, firms' dependency on banks diminished significantly after the Asian financial crisis, and mounting bank loans due to the accommodative monetary policy became more likely to increase bank lending to households for real estate purchases than bank lending to businesses to increase employment and equipment investments. Since the implementation of Abenomics in Japan, bank lending to businesses expanded more rapidly than bank lending to households, thus supporting corporate activities (Figure 5).

III. Empirical analysis

A. Model and data

This study considers the following reduced-form VAR model to compare the effectiveness of monetary policies.

Source: Bank of Japan

FIGURE 5
BANK LENDING GROWTH IN JAPAN

$$Y_t = B(L)\ Y_{t-1} + C(L)\ X_t + u_t,$$

where Y_t is an $m \times 1$ endogenous variable vector, X_t is an $n \times 1$ exogenous variable vector, u_t is the $m \times 1$ residual vector, and $E(u_t) = 0$, $E(u_t u_t') = \Sigma$. $B(L)$ and $C(L)$ refer to the matrix polynomial for lag operator L. Since the 2000s, the world economy has been rapidly globalizing, a force that cannot be ignored for Korea or Japan. Thus, the exogenous variable vector is reflected in the model to control the effect of external factors.

The basic model consists of eight endogenous variables: the policy interest rate, industrial production index, consumer price index, monetary base, 10-year government bond yield, exchange rate against USD, stock price, and bank lending. The policy interest rate, industrial production index, consumer price index, monetary base, 10-year government bond yield, and exchange rate against USD are variables frequently used to analyze the effect of monetary policies. Stock price and bank lending are variables added to examine the impact through the asset price and credit channels. Bank lending was classified into bank lending to households and bank lending to non-households to verify the possibility that the transmission through the credit channel may vary depending on the loan type.[11] In the following extended model,

[11] The time series of Korea's bank lending to business is short; thus, the channel through bank lending to business in both countries was not analyzed.

house prices[12] are added to examine the asset price channel closely.

This study includes three exogenous variables: global industrial production index, global consumer price index, and US federal funds rate. The first two variables reflect the real economy, and the third variable reflects the financial economy. This study considers the possibility that, although Korea and Japan are operating flexible exchange rate systems, the global financial cycle affects the monetary policies of both countries due to the worldwide financial integration. The US monetary policy is viewed as one of the main contributors to the global financial cycle.[13] The global industrial production index and global consumer price index are constructed by averaging the industrial production indexes and consumer price indexes of both countries' 19 major trading partners using their nominal GDPs as relative weights.[14]

Monetary policy shocks are identified using the sign restriction method in Uhlig (2005). First, the impulse response functions are derived such that, if the policy interest rates decrease, the prices and monetary base increase, thereby eliminating the price puzzle and liquidity puzzle that frequently appear in VAR analyses. Furthermore, by reflecting the expectations hypothesis of the term structure model that the long-term interest rates reflect the expectations of future short-term interest rates, the constraints are set to decrease long-term interest rates when the policy interest rates decline.[15] The impulse

However, given that corporate debt takes up a high percentage of non-household debt, the effect of bank lending to business can be indirectly determined by analyzing non-household debt.

[12] House price is analyzed only in Korea. The monthly house price index of Japan has a relatively short time series and is thus not suitable for analysis.

[13] According to the traditional "trilemma view," despite the free capital mobility, flexible exchange rates enable the independent operation of monetary policy. However, the recent "dilemma view" maintains that independent monetary policy is impossible if capital account is not controlled directly or indirectly (Rey, 2015).

[14] The 18 countries are Brazil, Canada, Chile, China, Columbia, the Czech Republic, the Euro area, Hungary, India, Israel, Norway, the Philippines, Poland, Russia, South Africa, Sweden, the UK, and the US, as well as Japan included for Korea and Korea included for Japan.

[15] The fact that the interest rate channel in Korea operated relatively smoothly was also considered (Bank of Korea, 2017). Japan implemented the yield curve control policy to increase purchases of long-term treasury bonds and maintain the 10-year government bond yield at a certain level to influence long-term interest rates.

response functions from immediately after a shock to 12 months must satisfy the sign restrictions, as in Sholl and Uhlig (2008) and Kim and Lim (2018). The present study extracts 5,000 impulse response functions that satisfy the sign restrictions and uses them as data to compare the effectiveness of the monetary policies.

Monthly data are used in the analysis. Raw data are used for the policy interest rate and 10-year government bond yield, whereas other data are measured as the logarithms multiplied by 100 to estimate the VAR model and derive the impulse response functions. Seasonally adjusted values are used for the industrial production index, monetary base, and bank lending. For the policy interest rate, the base rate announced by the Bank of Korea is used for Korea, and the "shadow policy rate" based on the method by Wu and Xia (2016) is used for Japan. Given that Japan used various unconventional monetary policies such as quantitative easing, negative interest rates, and yield curve control as its major policies during the sample period, the interest rates announced by the Bank of Japan are not sufficient to analyze the monetary policy stance.

Furthermore, similar to Sholl and Uhlig (2008) and Kim and Lim (2018), this study applies six lags in the endogenous variables and none in the exogenous variables.[16] The period of analysis for both countries is from July 2004 to September 2019. Details of the data used are provided in the Appendix.

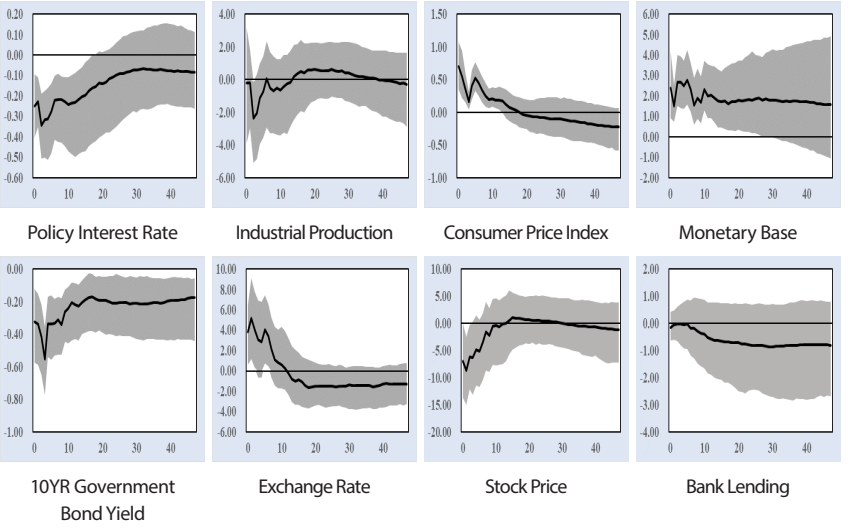
B. Analysis results

Figure 6 summarizes the impulse response functions of the key macroeconomic variables when a-25bp cut in policy interest rates shocks in the basic model.[17] According to the identification criteria of

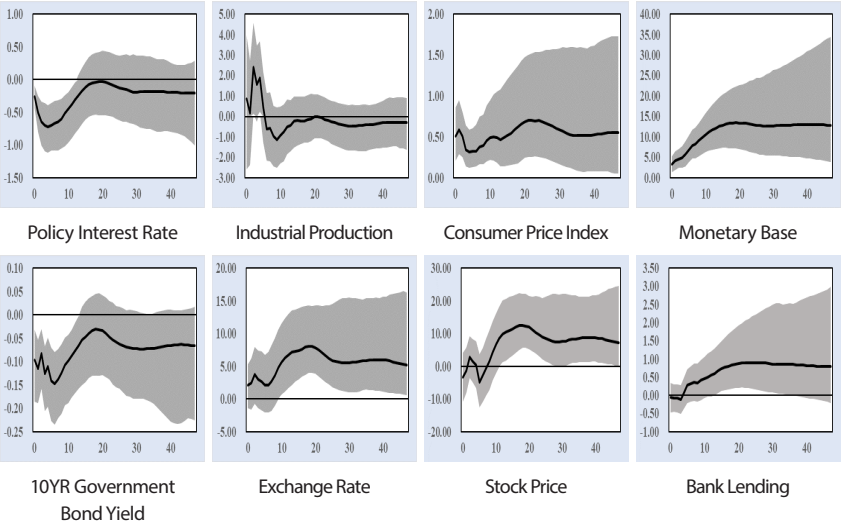
[16] For lag order selection, LR test, Akaike information criteria (AIC), and Schwarz information criteria (SC) suggest that using six, four, and one lag for Korea, respectively, is optimal. For Japan, LR test, AIC, and SC suggest seven, two, and one lag, respectively. This study adopts six lags considering that the previous studies such as Scholl and Uhlig (2008) and Kim and Lim (2017) used six lags and the analysis results of this study are robust to the variations of the lag order.

[17] Given the difficulty of securing sufficient time series, the direct effect of Abenomics, implemented since 2013, is not analyzed in this study. However, considering that the shadow policy rate and the Bank of Japan's asset growth

A. Korea



B. Japan



Note: Grey areas are the 68% error bands

Figure 6

Impulse Response Functions for Monetary Policy Shocks: All Bank Lending

monetary policy shocks, the prices and the monetary base increase, and the long-term interest rates decrease when the central banks of both countries lower the policy interest rates.

The size of the response does not vary much in prices, but Japan shows a more long-term increase than Korea. For the monetary base, Japan offers a greater and more significant response than Korea, and the effect also lasts relatively longer. The impact on long-term interest rates is more significant in Korea than in Japan, with a more substantial response.[18]

The exchange rate channel, asset price channel, and bank lending channel show a clear difference between the two countries. First, for the exchange rate channel, the JPY/USD exchange rate and KRW/USD exchange rate increase after a monetary policy shock; the response size is greater and more significant for JPY/USD and lasts for a long time. In Korea, the won depreciation lasts for a short time, and the effect of policy interest rates on exchange rates disappears in the mid- to long-term. For the asset price and bank lending channel, Japan shows a significant increase in stock prices and bank lending when the adjustment in policy interest rates is downward, whereas Korea decreases stock prices and bank lending, although the magnitude is not significant.

The effect of monetary policy on industrial production has high uncertainty in both countries. In Japan, industrial production increases partially after the Bank of Japan implements an accommodative monetary policy, but this response lasts for two months in the early period.[19] In the remaining period, the response of industrial production

rate show annual averages of −0.96% and 2.8% from 2004 to 2012 and −5.51% and 20.9% from 2013 to 2019, the estimation results of the monetary policy transmission effect in this study are likely to be because of the implementation of Abenomics to a considerable extent.

[18] Being cautious about assuming that the interest rate channel is more effective in Korea than in Japan is necessary. As a result of the "yield curve control" policy to minimize fluctuations in the long-term interest rates, the fluctuations of long-term interest rates can be relatively insignificant. The interest rate channel of Japan's monetary policy requires a counterfactual experiment as an additional analysis.

[19] This finding is partially consistent with previous results that, despite the smooth operation of the bank lending channel, the effect of boosting the real economy fell short of expectations. Bowman, Cai, Davies, and Kamin (2015)

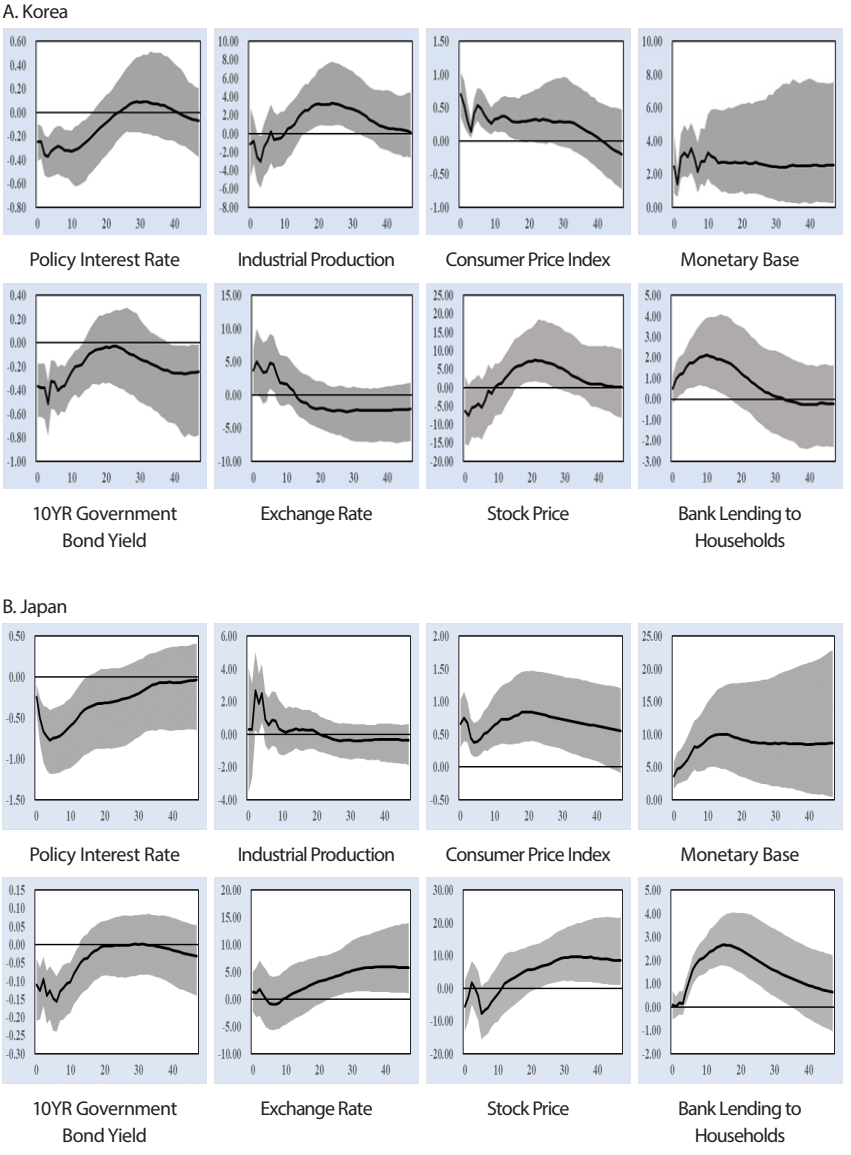
to monetary policy is small and insignificant. In Korea, the results indicate no significant increase in industrial production after decreasing policy interest rates.

Figures 7 and 8 illustrate the results after separating bank lending in the basic model into bank lending to households and bank lending to non-households. The figures show that the results in Japan are not much different from those obtained from the full bank lending sample even when considering the types of bank lending separately. An accommodative monetary policy shock increases prices and the monetary base and decreases long-term interest rates. Furthermore, the exchange rate, stock prices, and bank lending rise. The results for bank lending to households and bank lending to non-households do not differ much.

However, in Korea, the results show a clear difference between bank lending to households and bank lending to non-households. The analysis using overall bank lending shows that the effect of a lower policy interest rate on bank lending and stock prices is insignificant, but the analysis using bank lending to households shows that a lower policy interest rate leads to a significant rise in bank lending and stock prices. Furthermore, industrial production shows a substantial increase with a time lag. This effect disappears when using bank lending to non-households, showing contrary results; the lower policy interest rate leads to a fall in stock prices and bank lending. Furthermore, despite the cut in policy interest rates, industrial production does not show a significant response.

Considering that a large part of the bank lending to households in Korea is related to real estate, increased bank lending to households is expected because a downward adjustment in policy interest rates may result in soaring house prices. This study confirms this possibility using a nine-variable extended model applied to Korea by adding the house price variable to the basic model using bank lending to households.

analyzed the effect of quantitative easing (QE1) in 2001–2006 on the bank lending channel in Japan empirically. They concluded that, while bank liquidity had a statistically significant positive effect on bank lending, the effect on the real economy was extremely small. Montgomery and Volz (2017) also discovered that, while quantitative easing was effective in increasing bank lending, most of the effect was through undercapitalized banks; thus, the economic boost was limited.

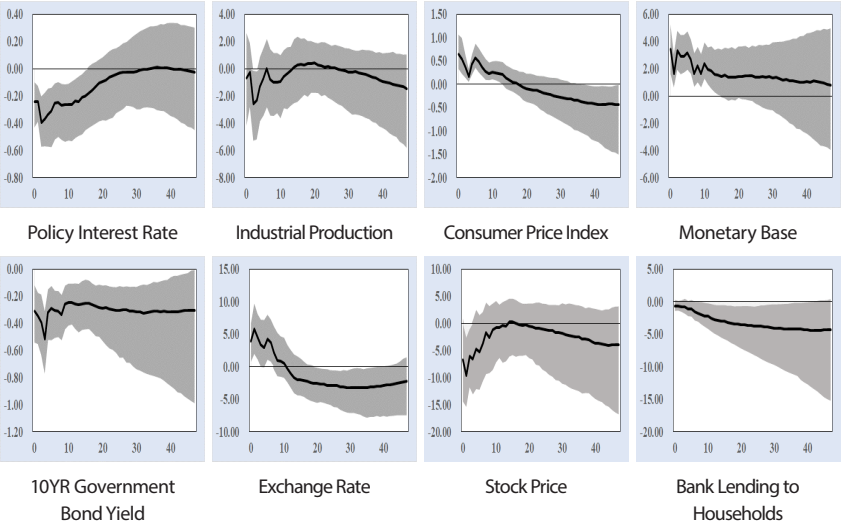


Note: Grey areas are the 68% error bands.

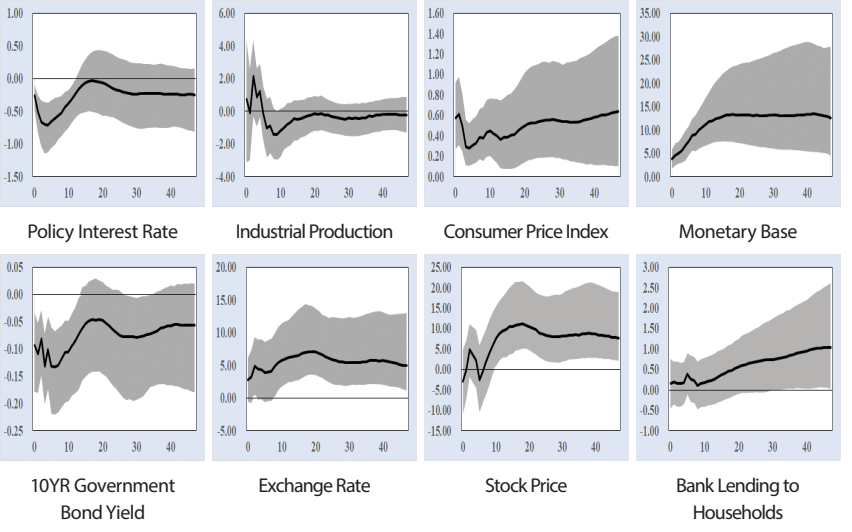
FIGURE 7

IMPULSE RESPONSE FUNCTIONS FOR MONETARY POLICY SHOCKS: BANK LENDING TO HOUSEHOLDS

A. Korea



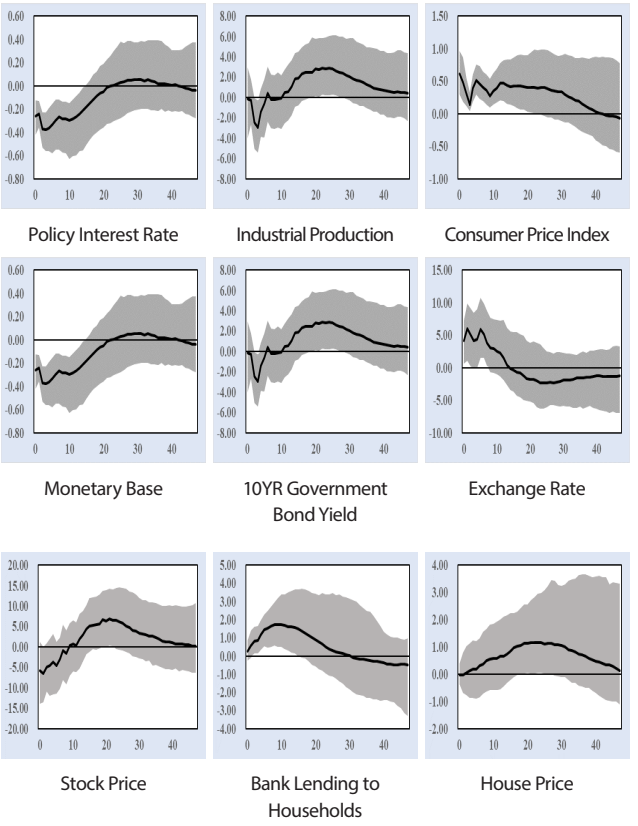
B. Japan



Note: Grey areas are the 68% error bands.

Figure 8

Impulse Response Functions for Monetary Policy Shocks: Bank Lending to Non-households



Note: Grey areas are the 68% error bands.

FIGURE 9
IMPULSE RESPONSE FUNCTIONS FOR MONETARY POLICY SHOCKS IN KOREA WITH HOUSE PRICES ADDED TO THE MODEL

Figure 9 shows the impulse response functions derived from the extended model. Similar to Figure 7, the extended model in Figure 9 shows that, after the decrease in the policy interest rate, bank lending to households balloons significantly, and stock prices and industrial production increase. Furthermore, house prices rise considerably after the cut in policy interest rates, as expected.

In summary, Korea has relatively greater constraints than Japan in terms of the effectiveness of its monetary policy. The effect of monetary policy on decreasing long-term interest rates is large, but the effect on the exchange rate is short-term, and no effect is observed through the

asset price and bank lending channels. However, after splitting the bank lending channel, the lowering in policy interest rates leads to rising bank lending to households, thereby inducing increased stock prices and industrial production to a certain extent. However, this effect is possibly accompanied by a rise in house prices. Meanwhile, despite the difference in effectiveness, monetary policy may have limited success in boosting the real economy in Korea and Japan.

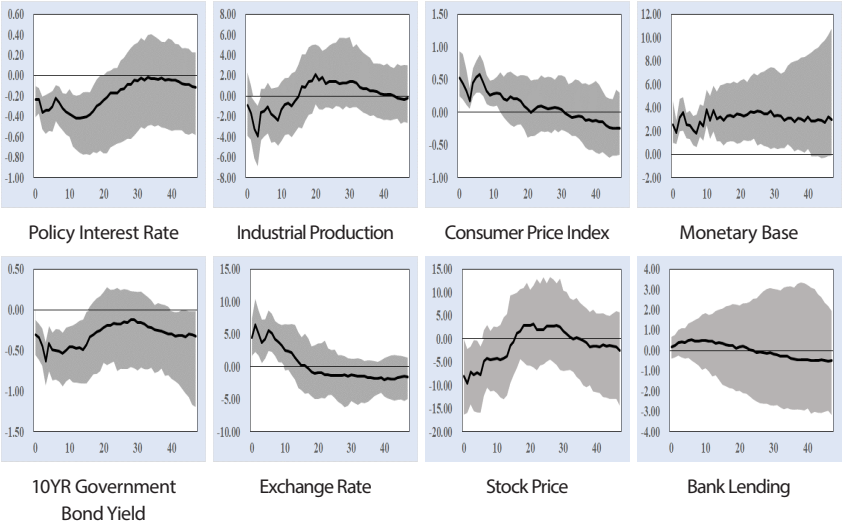
C. Robustness checks

This section reports on three additional analyses to check the robustness of the main results. Figure 10 shows how the impulse response functions change in the basic model when the lags of endogenous variables are increased to eight.[20] The overall results do not alter much from the original model, which uses six lags. The exchange rate channel, stock price channel, and bank lending channel operate more smoothly in Japan than in Korea like when using six lags. However, the change in lags makes the difference in the impulse response functions for industrial production. Industrial production in Korea does not show a significant response when using six lags, but the results show a significant decline when using eight lags, even though it is just for a short time. Industrial production in Japan indicates only a slight variation in the impulse response according to lags.

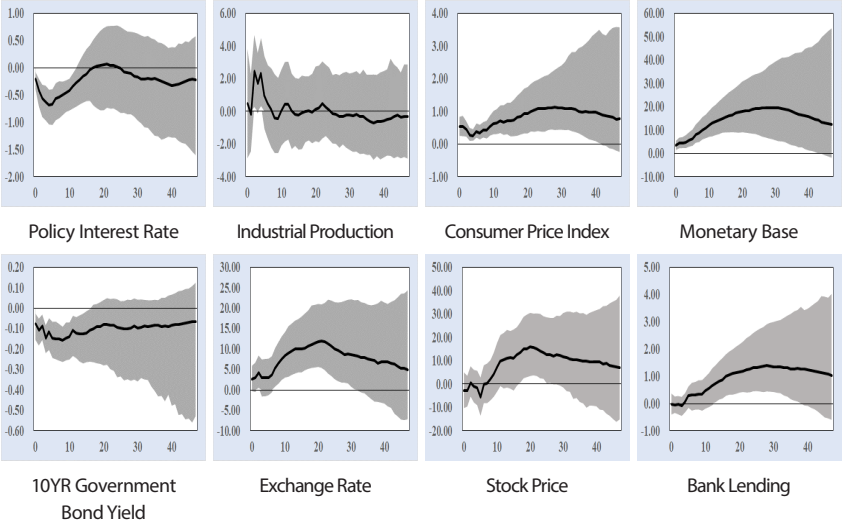
Figure 11 shows the impulse response functions when using the industrial production and consumer price index of only the US, the Euro area, and China to create exogenous variables such as the global industrial production index and global consumer price index instead of the full set of 19 major trading partners. The results show little difference. In Japan, the shock of a lowering in policy interest rates leads to a mid- to long-term increase in the exchange rate, stock prices, and bank lending. However, in Korea, the depreciation of the Korean won is merely short-term and shows no rise in stock prices or bank lending. The impact of a shock of a cut in policy interest rates on industrial production shows high uncertainty in Japan and Korea, but the results are similar to those of the extended experiments using eight lags. Korea first shows a significant shrinkage in industrial production,

[20] Using nine or more lags widens the error band significantly because of the degrees of freedom problem.

A. Korea



B. Japan

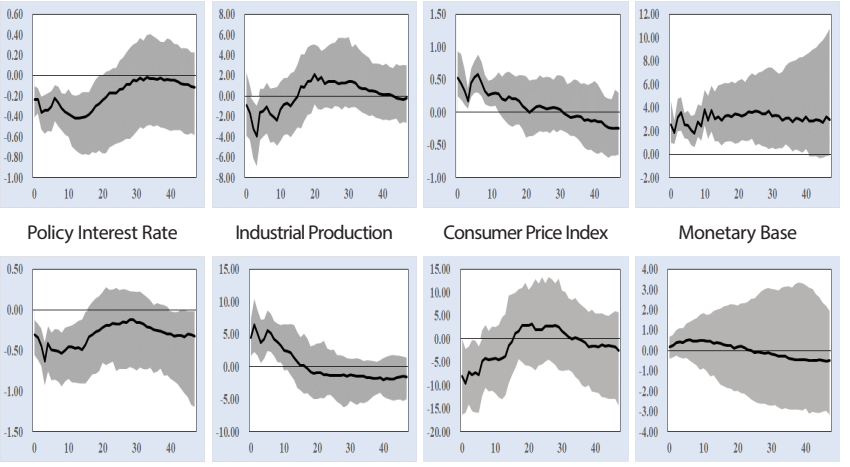


Note: Grey areas are the 68% error bands.

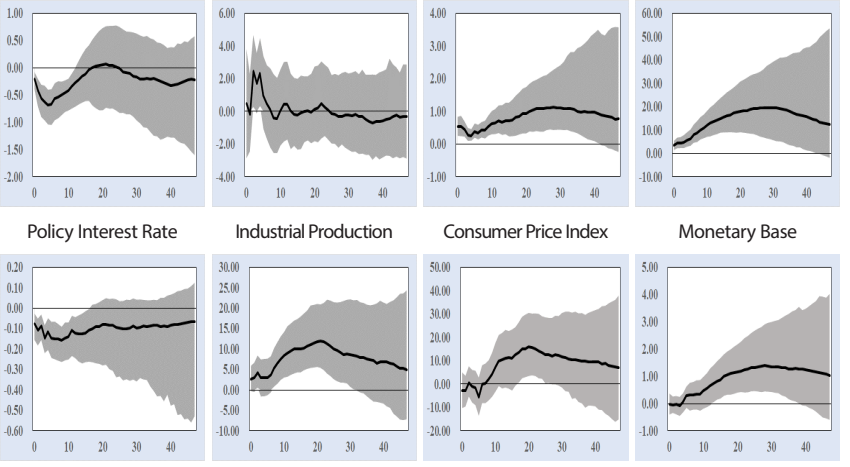
FIGURE 10

IMPULSE RESPONSE FUNCTIONS FOR MONETARY POLICY SHOCKS IN KOREA USING EIGHT LAGS OF THE ENDOGENOUS VARIABLES

A. Korea



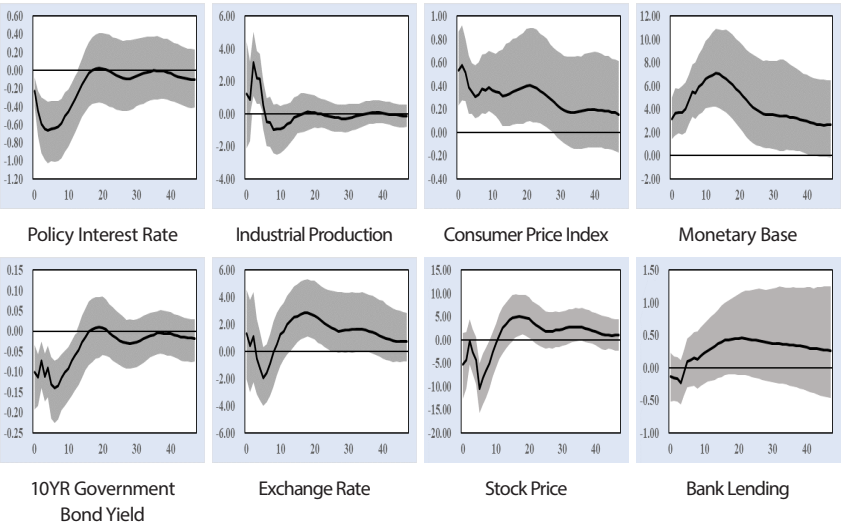
B. Japan



Note: Grey areas are the 68% error bands.

Figure 11

Impulse Response Functions for Monetary Policy Shocks: Aggregated the Variables Using the Data from the US, Euro Area, and China



Note: Grey areas are the 68% error bands.

FIGURE 12
IMPULSE RESPONSE FUNCTIONS FOR MONETARY POLICY SHOCKS IN JAPAN: ABENOMICS AS AN EXOGENOUS VARIABLE

but this response remains during a brief period.

Finally, Figure 12 shows the resulting changes when adding a dummy variable for the implementation period of Abenomics as an exogenous variable in Japan. This change accounts for the possibility that the transmission channels of Japan's monetary policy may have varied since the implementation of Abenomics.[21] Even when adding this dummy variable, no qualitative difference is observed in terms of transmission channels or effects of monetary policy. However, in the quantitative aspect, the transmission channels and effects weaken after adding the dummy variable. In particular, stock prices temporarily fall from the shock until after 12 months, and the expansion in bank lending is no longer significant. Nonetheless, no difference is found in the conclusion that the monetary policy shocks in Japan have a greater and more apparent impact on major macroeconomic variables than those in Korea.

[21] Botman *et al.* (2015) claimed that Abenomics could have these outcomes when differentiating the size or scope of the monetary policy compared to before.

IV. Conclusion

This study comparatively analyzes the transmission channels and effects of monetary policies in Korea and Japan using the sign restriction VAR model to determine whether a Japanese-style monetary policy can be implemented in Korea. The results indicate significant differences in the monetary policy transmission channels between Korea and Japan. In Japan, conventional monetary policy transmission channels such as the exchange rate channel, asset price channel, and bank lending channel operate relatively well. However, these transmission channels do not function smoothly in Korea. The interest rate channel is effective in Korea but has only a short-term effect on exchange rates, and the asset price and bank lending channels are hard to expect.

Furthermore, some potential risks may hinder financial stability through the housing market. Such differences in the effectiveness of monetary policy are because of the different economic structures of the two countries, such as the impact of the global economy, financial market structure, and asset ownership of households. Meanwhile, Korea and Japan show a limited effect on production in the real side of the economy. Considering these results, Korea must be careful about implementing a similar monetary policy as Japan. As the low-growth, low-inflation environment is expected to become the new normal, and an increasing need for a monetary policy response is observed. However, Korea must devise measures while closely reviewing the internal and external economic environment, the financial market conditions, and the behaviors of economic agents. Furthermore, efforts to prevent the low-growth and low-inflation pressure from setting in through finding new growth engines and reforming the economy's fundamentals are necessary.

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Appendix: Data Sources

Variables	Sources and Notes
Policy interest rate	Korea: Base rate announced by the Bank of Korea / Japan: Shadow policy rate estimated by the Reserve Bank of New Zealand following Wu and Xia (2016)
Monetary base	Bank of Korea and Bank of Japan; seasonal adjustment using Census X-12 on E-views
10-year government bond yield	OECD Main Economic Indicators
Industrial production index	IMF International Financial Statistics. Seasonal adjustment index
Consumer price index	IMF International Financial Statistics
The exchange rate against USD	IMF International Financial Statistics
Stock price index	Bank of Korea. KOSPI in Korea; NIKKEI index in Japan
Bank lending	Bank of Korea and Bank of Japan; amount lent by deposit banks
House price index	Kookmin Bank; House Purchasing Price Index