

Factors Affecting the Recent Rise of the USD/KRW Exchange Rate and Implications

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The USD/KRW exchange rate recently surged to 1,130 won per dollar after it moved sideways in a range between 1,050 and 1,090 won per dollar during the first half of 2018. The surge in the exchange rate was due primarily to the strong US dollar, risk aversion in global financial markets due to the escalating US-China trade dispute, and fears of economic slowdown in Korea arising from a decline in exports amid the trade frictions.

The analysis of movements in the USD/KRW exchange rate over the past decade found that the exchange rate has been affected significantly by the US Dollar Index and the risk preference of the financial markets. Apart from such financial market factors, the analysis results also confirmed that the exchange rate changes have been in part closely related to Korea's economic growth rate. Given its heavy reliance on the external sector, Korea needs to sustain the external sector's soundness, and carefully assess changes in the financial market and respond to them accordingly in order to minimize the impact of external shocks on the exchange rate.

The US dollar to Korean won (USD/KRW) exchange rate, which had started to decline in the second half of 2017, was stable, moving sideways in a range between 1,050 and 1,090 won per dollar until May 2018 despite two interest rate hikes from the US Federal Reserve (Fed) in the first half of 2018 and expectations for four Fed rate hikes this year. Since June 2018, however, the Korean financial market has rattled and the USD/KRW exchange rate has soared to 1,130 won

* All opinions expressed in this paper represent the author's personal views and thus should not be interpreted as Korea Capital Market Institute's official position.

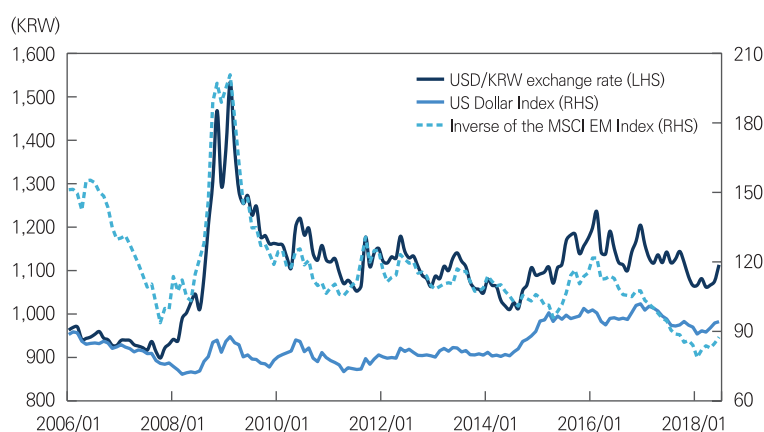
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per dollar as US-China trade war fears became a reality. Such a phenomenon also occurred in the past as global financial markets became unstable. This article conducts an empirical analysis on the extent to which financial market factors affect USD/KRW exchange rate movements.¹⁾ And it explores whether the growth rate differential between South Korea and developed countries is related to the exchange rate changes. Finally, the article presents implications.

Financial market factors affecting movements in the USD/KRW exchange rate²⁾

As shown in Figure 1 below, the USD/KRW exchange rate has a high correlation to the US Dollar Index and the MSCI Emerging Markets (EM)³⁾ Index. The US Dollar Index (USDIX) is a measure of the value of US dollar relative to a basket of foreign currencies.⁴⁾ The USD/KRW exchange rate is influenced by changes in the USDIX. Moreover, the value of the Korean won is affected by risk preference as is the case with other emerging market currencies. Overall, when risk preference increases, the exchange rate declines (the strong won). Conversely, when risk aversion increases, the exchange rate rises (the weak won).

Figure 1. USD/KRW exchange rate and global financial market factors



Note: The 'inverse of the MSCI EM Index' is computed by multiplying the inverse of the index by a constant.
Source: Bloomberg

- 1) An exchange rate is influenced by various factors, including domestic factors (e.g., a country's current account balance or economic growth rate) and global factors, and it is one of the most difficult financial variables to predict. This article just intends to investigate the extent to which two global financial market variables, i.e., the US Dollar Index and risk preference, impact the exchange rate.
- 2) An empirical analysis was conducted to compute quarterly (three-month) percentage changes in the USD/KRW exchange rate, the US Dollar Index (USDIX) and MSCI EM Index using their monthly averages from 1Q2001 to 2Q2018 (70 quarters in total).
- 3) The MSCI EM Index is an index used to measure equity market performance in emerging market countries and is also used as an indicator of risk preference. For an exchange rate analysis, the index without exchange rate effects was used.
- 4) The following six currencies are used to calculate the index: Euro, Japanese yen, Pound sterling, Canadian dollars, Swedish krona, and Swiss franc.

For starters, I compared the direction of changes in the USD/KRW exchange rate depending on USDX fluctuations. As illustrated in Table 1, 31 quarters experienced an increase in the USDX, and 20 out of the 31 quarters saw a rise in the USD/KRW exchange rate as well.⁵⁾ The remaining 11 quarters revealed a decline in the exchange rate, which moved inversely to the USDX. Out of the 11 quarters, 10 experienced a rise in the MSCI EM Index, suggesting that risk preference was a factor driving the exchange rate down over that period. Furthermore, 39 quarters experienced a fall in the USDX and 28 out of the 39 quarters also faced a drop in the USD/KRW exchange rate.⁶⁾ The other 11 quarters showed an upturn in the USD/KRW exchange rate despite the decline in the USDX, while 6 quarters of them saw a fall in the MSCI EM Index, allowing us to infer that the rise in the exchange rate was driven by risk aversion. As such, a large fraction of the variance in the exchange rate can be explained by the combination of the USDX and the MSCI EM Index, which is a measure of risk preference.

Furthermore, a regression analysis, which was carried out using percentage change in the USD/KRW exchange rate as a dependent variable,⁷⁾ found the significant impact of each of the two global factors on the exchange rate. Adjusted R^2 was 0.55, which indicates good explanatory power.⁸⁾ As seen in Table 2 below, the coefficient of the USDX was positive (+) whereas the coefficient of the MSCI EM Index was negative (–). This means that an increase (or drop) in the USDX is a driving factor behind an increase (or drop) in the USD/KRW exchange rate, and a rise (or fall) in the MSCI EM Index is a driver of a rise (or fall) in the USD/KRW exchange rate.

5) The probability that when the USDX rises (the strong dollar), the USD/KRW exchange rate also goes up (the weak won) is $20/31=0.645$.

6) The probability that when the USDX slides (the weak dollar), the USD/KRW exchange rate also goes down (the strong won) is $28/39=0.718$.

7) Regression model: (percentage change in the USD/KRW exchange rate) = $a + b \times (\text{percentage change in the USDX}) + c \times (\text{percentage change in the MSCI EM Index}) + \text{error term}$

8) An adjusted R^2 value generally lies between 0 and 1. Values closer to 1 indicate good explanatory power.

Table 1. Direction of changes in the USDX and the exchange rate

(Unit: No. of quarters)

	A decline in the USD/KRW exchange rate (Strong won)	An increase in the USD/KRW exchange rate (Weak won)	Total
A rise in the USDX	11	20	31
	(10 quarters showed MSCI EM ↑: risk preference)	(the USDX and the USD/KRW exchange rate move in the same direction, both up)	
A drop in the USDX	28	11	39
	(the USDX and the USD/KRW exchange rate move in the same direction, both down)	(6 quarters showed MSCI EM ↓: risk aversion)	
Total	39	31	70

Source: Bloomberg

Table 2. Results from the regression analysis of percentage changes in the USD/KRW exchange rate

Independent Variable	Coefficient
Constant, a	0.0047
USDX, b	0.4319***
MSCI EM Index, c	-0.2666***
Adjusted R ²	0.5494

Note: 1) The regression analysis uses the 1Q2001 - 2Q2018 (70 quarters) data on percentage changes in the exchange rate.

2) *, **, *** indicate the significance level of 10%, 5% and 1%, respectively. The constant is not significant.

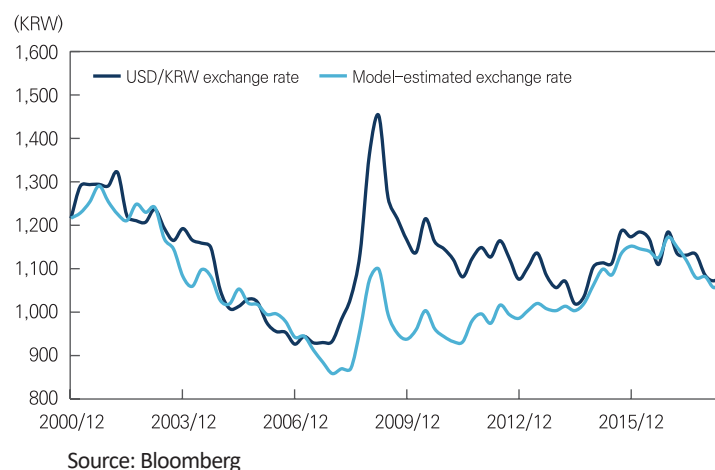
USD/KRW exchange rate changes and economic growth rate

Figure 2 depicts the model-estimated exchange rate, computed using the coefficients derived from the regression analysis,⁹⁾ and the actual USD/KRW exchange rate. The gap between the model-estimated and actual exchange rates widened right before the financial crisis and narrowed from 2011 onwards. Taking into account an excessive pickup in the USD/KRW exchange rate before and after the financial crisis, and a plunge in the economic growth rate over the same period, the economic growth rate of Korea was compared with that of developed countries.

9) To compute the model-estimated exchange rate, quarterly percentage changes in the KRW/USD exchange rate were calculated with coefficients in Table 2 as follows: $0.0047 + 0.4319 \times (\text{percentage change in the USDX}) - 0.2666 \times (\text{percentage change in the MSCI EM Index})$.

To assess the gap in Figure 2, the residual (error term)¹⁰⁾ in the regression analysis, which was used to explain the determinants of the exchange rate with global financial market factors, may be understood as a domestic factor. Figure 3 exhibits the domestic factor and the growth rate differential between Korea and developed countries. When the growth rate differential was compared with the domestic factor moving two quarters ahead,¹¹⁾ the two indicators showed similar trends. In Figure 3, the domestic factor had a large positive (+) value before and after the financial crisis, which indicates the USD/KRW exchange rate rose more than the model-estimated exchange rate. In the same period, Korea's economic growth rate declined far more than developed countries'.

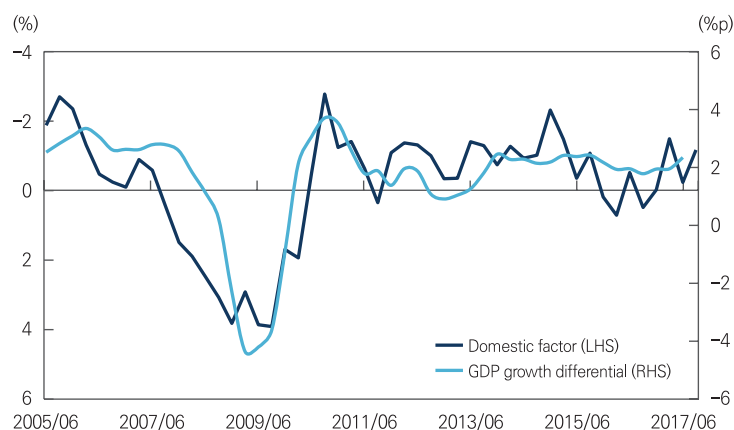
Figure 2. Actual and model-estimated USD/KRW exchange rates



10) The residual indicates the difference between the actual percentage change and the model-estimated percentage change in the exchange rate. The residual does not include the percentage changes in the exchange rate affected by global financial market factors.

11) Just as stock prices are a well-known leading indicator of economic activity, financial market variables lead the real economy.

Figure 3. Domestic factor contributing to the exchange rate variance and the growth rate differential



Note: 1) (Annual) GDP growth differential = Korea's GDP – Developed countries' GDP. The developed countries here include Australia, Canada, the Eurozone, Japan, Sweden, the UK and the US.

2) Domestic factor = 4-quarter moving average with two quarters ahead. The scale of the vertical axis on the left is reversed [the downward direction is a plus (+) sign, meaning the weak won].

Source: Bloomberg

Conclusion

Recent trade frictions have rattled the global financial markets. It is expected that the trade disputes will not reduce trade volumes or have no large impact on the real economy for the time being. However, the impact of an expected slowdown in growth caused by uncertainty and the resultant investment decline has sent shock waves through the financial markets.¹²⁾ Under these circumstances, the USD/KRW exchange rate rose substantially. The causes of the exchange rate surge can be boiled down to the strong US dollar and the increased risk aversion after the financial market shock (i.e., global financial market factors). In addition, uncertainty over the growth rate of the domestic economy highly dependent on exports and fears of economic slowdown were reflected more in the exchange rate than in those of other countries, consequently pushing the USD/KRW exchange rate up further.¹³⁾

As explained above, it should be noted that fluctuations in the USD/KRW exchange rate may

12) Kang, Hyunju, 2018, Examining Concerns over Foreign Capital Flight Induced by Interest Rate Reversal, KCM I Capital Market Focus, Issue No. 2018-14.

13) Percentage changes in the exchange rate from June 4 to July 2, 2018: The USD/KRW exchange rate was up by 4.38%, and the USDX went up by 0.88%. Considering that the MSCI EM Currency Index was down by 3.36% (indicating emerging market currency weakness), the exchange rate and the USDX actually increased much more. And the percentage change in the exchange rate estimated using the model in Table 2 was 2.32%. The rise of the actual exchange rate exceeded that of the model-estimated exchange rate by 2.06%.



be driven by both the global financial market factors, the movements of the US Dollar Index (USDIX) and the MSCI EM Index, and the domestic factor moving one or two quarters ahead of the economic growth rate. Although Korea could not insulate the domestic economy from external shocks due to its heavy reliance on the external sector including exports, it should strive to sustain the external sectors' soundness in order to minimize the impact of external shocks on the USD/KRW exchange rate. In addition, Korea needs to closely watch financial market changes and respond to them accordingly, considering that uncertainty over the future of the real economy can be reflected in the financial market in advance, as is the case in June this year.