World Journal of Business and Management
ISSN 2377-4622
2015, Vol. 1, No. 2

Recent Comovements of the Yen-US Dollar Exchange Rate and Stock Prices in Japan

Chikashi Tsuji

Professor, Faculty of Economics, Chuo University

742-1 Higashinakano Hachioji-shi, Tokyo 192-0393, Japan

E-mail: mail_sec_low@minos.ocn.ne.jp

Received: September 28, 2015 Accepted: October 20, 2015 Published: October 25, 2015

doi:10.5296/wjbm.v1i2.8461 URL: http://dx.doi.org/10.5296/ wjbm.v1i2.8461

Abstract

This paper examines the recent relations of the yen/US dollar exchange rate and stock prices in Japan. Using bivariate Bayesian Vector Autoregressive (VAR) models, we derive several interesting findings as follows. First, 1) our analyses by Bayesian VAR models clarify that recently, the daily lags of the yen/dollar exchange rate series statistically significantly explain the evolution of the Nikkei 225, Nikkei 500, Japan Securities Dealers Association Quotation (JASDAQ), and Tokyo Stock Price Index (TOPIX) Core 30 stock index prices in Japan. Second, 2) our impulse response analyses reveal that Japanese stock prices clearly respond to the yen/dollar exchange rate changes in the recent years whilst the exchange rate changes little respond to the stock prices in Japan. As above our results demonstrate, recently, the past yen/dollar exchange rate time-series much more affect the evolution of the Japanese stock prices whilst the past Japanese stock price series little affect the yen/dollar exchange rate changes. Moreover, 3) analyzing the time-varying correlation coefficients between the yen/dollar exchange rate changes and Japanese stock returns, we also find the large increases in the contemporaneous correlations between the exchange rate and stock returns in the recent years in Japan.

Keywords: Bayesian VAR model, Comovement, Exchange rate, Stock price

1. Introduction

Recently, the yen has been highly depreciated than before while the Japanese stock prices have generally increased. Then how are the correlations between the yen/dollar exchange rate changes and Japanese stock price series recently? Did the relations between them change in the recent years? In order to answer the question by using the actual time-series data, this paper examines the recent relations between the yen/US dollar exchange rate and several stock prices in Japan. As for methodology in our analyses, we apply Bayesian Vector Autoregressive (VAR) models to the time-series data.

Our interesting findings are as follows. First, 1) our analyses by Bayesian VAR models clarify that recently, the daily lags of the yen/dollar exchange rate statistically significantly explain the price movements of the Nikkei 225, Nikkei 500, Japan Securities Dealers Association Quotation (JASDAQ), and Tokyo Stock Price Index (TOPIX) Core 30 stock indices in Japan. Second, 2) our impulse response analyses reveal that the yen/dollar exchange rate series strongly affect the stock price changes in the recent years whilst the exchange rates show little clear response to the shock in stock prices in Japan. Moreover, 3) our analyses of the time-varying correlation coefficients between the yen/dollar exchange rate changes and stock returns in Japan also derive the clear evidence of the higher contemporaneous correlations between stock returns and the exchange rate changes in the recent years. As for the rest of this paper, Section 2 reviews existing studies; Section 3 introduces our data and variables; Sections 4 describes our methodology; Section 5 explains our results; and Section 6 presents our conclusions.

2. Literature Review

We here review very recent related studies. First, Litsios (2013) suggested that the UK equity market significantly affected the nominal values of pound sterling effective exchange rate in the long-run from 1982 to 2011. Tsagkanos and Siriopoulos (2013) estimated the relations between stock prices and exchange rates in the US and EU during the recent financial crisis from 2008 to 2012. Śmiech and Papież (2013) tested the causality among fossil fuel prices, exchange rates, and the German stock index by using weekly data from October 2001 to June 2012. Dellas and Tavlas (2013) examined exchange rate regimes and asset prices and they suggested that the responses of asset prices to various shocks slightly differed across regimes.

Using international data during the banking crisis from 2007 to 2010, Caporale et al. (2014) examined the relations between stock market prices and exchange rates in the US, UK, Canada, Japan, the euro area, and Switzerland. Du (2014) tested a hypothesis that persistent evolution of exchange rates is a distress risk and a Merton's (1973) state variable; and this study derived the supportive evidence for the hypothesis. Ho and Huang (2015) tested the nonlinear relations between stock price indices and exchange rates of Brazil, Russia, India, and China. Abouwafia and Chambers (2015) tested the linkages among monetary policy, exchange rates, and stock prices in the Middle East region. Gelman et al. (2015) analyzed the relations between real exchange rates and capital flows. Kal et al. (2015) examined the international links among stocks, bonds and exchange rates. Using major emerging market data, Aktuğ (2015) tested the interactions among financial assets including exchange rates.

Table 1. Descriptive statistics of the changes in terms of the yen/dollar exchange rate and stock returns in Japan

Panel A. Descriptive statistics for the period from April 1, 2010 to November 13, 2012			
	EXLR	NK225LR	NK500LR
Mean	−0.0251	−0.0382	−0.0308
Maximum	3.8351	5.5223	7.1975
Minimum	−2.1419	−11.1534	−10.0262
Standard deviation	0.5693	1.3127	1.1793
Skewness	1.1281	−1.0367	−1.0472
Kurtosis	9.9756	11.4627	14.6176
	JASLR	TC30LR	
Mean	−0.0051	−0.0598	
Maximum	4.2211	5.1994	
Minimum	−10.4454	−8.4268	
Standard deviation	0.9052	1.2561	
Skewness	−3.7422	−0.6563	
Kurtosis	44.6840	7.9389	
Panel B. Descriptive statistics for the period from December 26, 2012 to August 18, 2015			
	EXLR	NK225LR	NK500LR
Mean	0.0590	0.1101	0.1203
Maximum	3.1691	4.8257	4.9723
Minimum	−2.7370	−7.5974	−7.0494
Standard deviation	0.6142	1.3952	1.2255
Skewness	0.2390	−0.5559	−0.5899
Kurtosis	6.5219	5.6367	6.0890
	JASLR	TC30LR	
Mean	0.1202	0.0969	
Maximum	5.3041	5.3502	
Minimum	−5.5511	−6.1749	
Standard deviation	1.1445	1.3005	
Skewness	−0.6617	−0.1642	
Kurtosis	6.8652	4.8635	

Notes: Descriptive statistics for the analyzed variables are shown in this table. EXLR denotes the percentage log changes of the yen/dollar exchange rate, NK225LR means the percentage log return of the Nikkei 225 stock index, NK500LR means the percentage log return of the Nikkei 500 stock index, JASLR denotes the percentage log return of the JASDAQ stock index, and TC30LR represents the percentage log return of the TOPIX Core 30 stock index in Japan.

3. Data

This section describes our data and variables. We use an exchange rate and four Japanese stock index series. Specifically, EXLR denotes the percentage log changes of the yen/US dollar exchange rate, NK225LR means the percentage log return of the Nikkei 225 stock index, NK500LR means the percentage log return of the Nikkei 500 stock index, JASLR denotes the percentage log return of the JASDAQ stock index, and TC30LR represents the percentage log return of the TOPIX Core 30 stock index in Japan. We also use the level variables of the above five variables. Namely, EX denotes the level variable of the yen/dollar exchange rate, NK225 means the level variable of the Nikkei 225 stock index, NK500 means the level variable of the Nikkei 500 stock index, JAS denotes the level variable of the JASDAQ stock index, and TC30 represents the level variable of the TOPIX Core 30 stock index in Japan. Further, our analyzing sample periods are firstly 1) from April 1, 2010 to November 13, 2012 and secondly 2) from December 26, 2012 to August 18, 2015. All data for our analyses are from the QUICK Corp.

The descriptive statistics of the above five daily time-series of log change (return) variables are shown in Table 1. This table suggests the following variable characteristics. First, 1) the mean values of the five variables are all negative for the period from April 1, 2010 to November 13, 2012 and they are all positive for the period from December 26, 2012 to August 18, 2015. Second, 2) the standard deviations of the five variables are slightly higher for the period from December 26, 2012 to August 18, 2015 than those for the period from April 1, 2010 to November 13, 2012. We also show the standard correlation coefficients among EXLR, NK225LR, NK500LR, JASLR, and TC30LR in Table 2. Table 2 clearly shows that the standard correlation coefficients between the changes of the yen/US dollar rate and the four Japanese stock returns are much higher for the period from December 26, 2012 to August 18, 2015 than those from April 1, 2010 to November 13, 2012.

4. Methodology and Models

This section documents our analyzing methodology and models. In order to examine the dynamic linkages of the yen/dollar exchange rate and Japanese stock index prices, we first compute and compare the time-varying correlation coefficients with 20-days windows. Second, we estimate four kinds of bivariate Bayesian VAR models with level variables and examine the impulse response functions derived from the VAR models.

More concretely, the models we estimate in this paper are the bivariate Bayesian VAR(4) models of 1) EX and NK225; 2) EX and NK500; 3) EX and JAS; and 4) EX and TC30. We can summarize all our VAR models as the equations (1) and (2) as below.

$$y_t = \tau_1 + \sum_{h=1}^{p} \xi_{1,h} y_{t-h} + \sum_{j=1}^{q} \phi_{1,j} z_{t-j} + \kappa_{1,t}, \quad (1)$$

$$z_t = \tau_2 + \sum_{r=1}^{p} \xi_{2,r} y_{t-r} + \sum_{s=1}^{q} \phi_{2,s} z_{t-s} + \kappa_{2,t}. \quad (2)$$

In the above models, we employ the lag orders $p = 4$ and $q = 4$ to maintain the consistency of our analyses. Further, in the above equations, y is the yen/dollar exchange rate and z means

one of the four Japanese stock prices: the Nikkei 225 stock index, the Nikkei 500 stock index, the JASDAQ stock index, or the TOPIX Core 30 stock index.

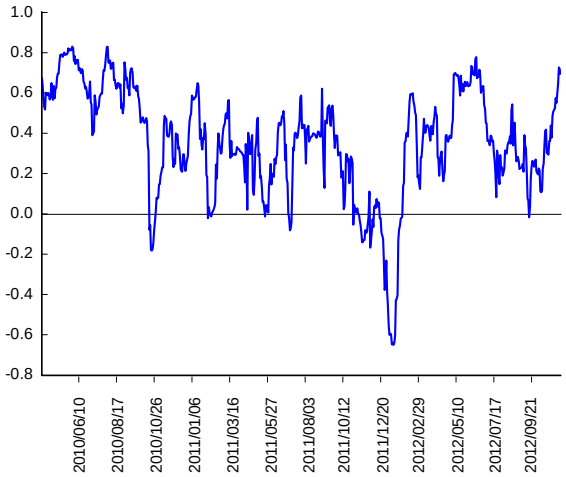
Table 2. Correlation coefficients among the changes of the yen/dollar exchange rate and returns of stock indices in Japan

Panel A. Correlation coefficients for the period from April 1, 2010 to November 13, 2012					
	EXLR	NK225LR	NK500LR	JASLR	TC30LR
EXLR	1.0000				
p-value	–				
NK225LR	0.3752***	1.0000			
p-value	0.0000	–			
NK500LR	0.3407***	0.9752***	1.0000		
p-value	0.0000	0.0000	–		
JASLR	0.1929***	0.6479***	0.7010***	1.0000	
p-value	0.0000	0.0000	0.0000	–	
TC30LR	0.3517***	0.9446***	0.9345***	0.6448***	1.0000
p-value	0.0000	0.0000	0.0000	0.0000	–
Panel B. Correlation coefficients for the period from December 26, 2012 to August 18, 2015					
	EXLR	NK225LR	NK500LR	JASLR	TC30LR
EXLR	1.0000				
p-value	–				
NK225LR	0.6507***	1.0000			
p-value	0.0000	–			
NK500LR	0.6224***	0.9674***	1.0000		
p-value	0.0000	0.0000	–		
JASLR	0.3869***	0.6069***	0.6608***	1.0000	
p-value	0.0000	0.0000	0.0000	–	
TC30LR	0.6460***	0.9395***	0.9389***	0.6104***	1.0000
p-value	0.0000	0.0000	0.0000	0.0000	–

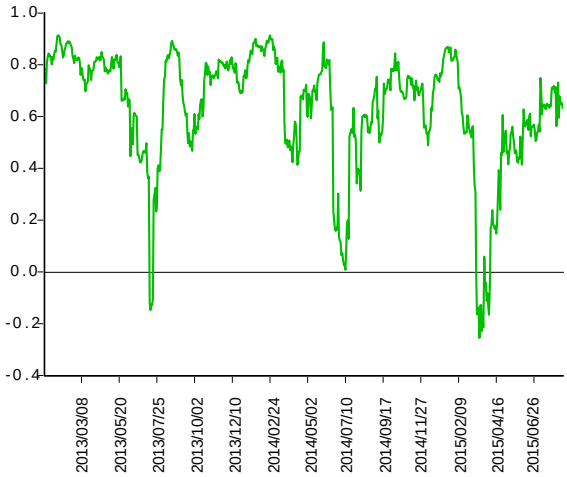
Notes: This table shows standard correlation coefficients for our two sample periods and they are those among the log changes of the yen/dollar exchange rate and the log returns of four kinds of stock indices in Japan. Regarding our variables, EXLR denotes the percentage log changes of the yen/dollar exchange rate, NK225LR means the percentage log return of the Nikkei 225 stock index, NK500LR means the percentage log return of the Nikkei 500 stock index, JASLR denotes the percentage log return of the JASDAQ stock index, and TC30LR represents the percentage log return of the TOPIX Core 30 stock index in Japan. In this table, *** denotes the statistically significant rejection of the null hypothesis that the absolute value of the correlation coefficient is zero at the 1% level.

Panel A. EXLR and NK225LR

April 1, 2010 to November 13, 2012

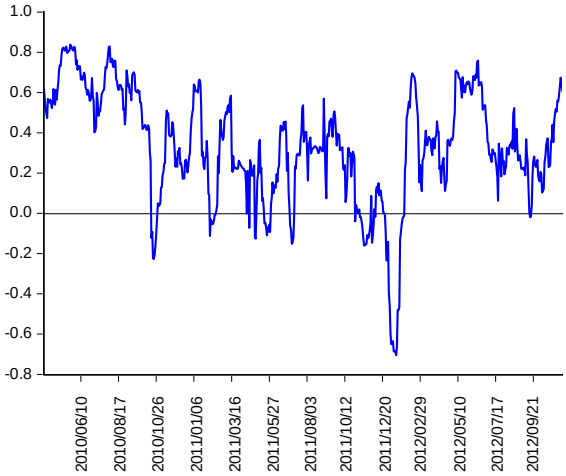


December 26, 2012 to August 18, 2015

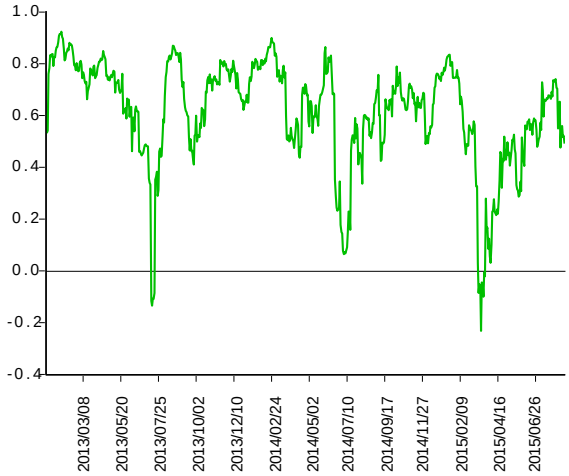


Panel B. EXLR and NK500LR

April 1, 2010 to November 13, 2012

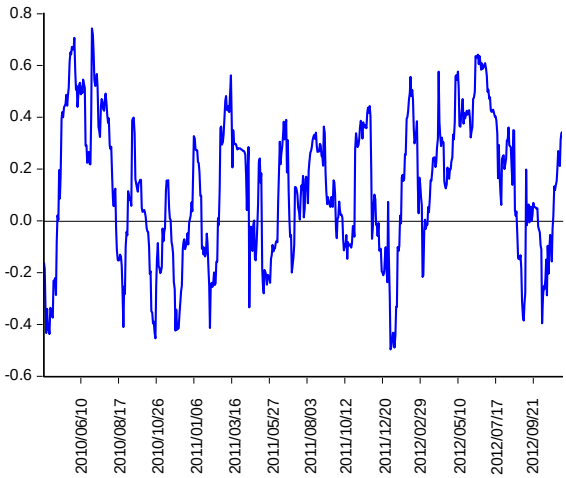


December 26, 2012 to August 18, 2015

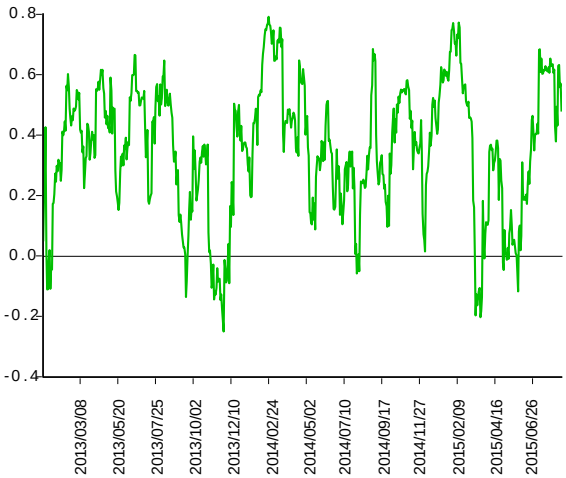


Panel C. EXLR and JASLR

April 1, 2010 to November 13, 2012



December 26, 2012 to August 18, 2015



Panel D. EXLR and TC30LR

April 1, 2010 to November 13, 2012 December 26, 2012 to August 18, 2015

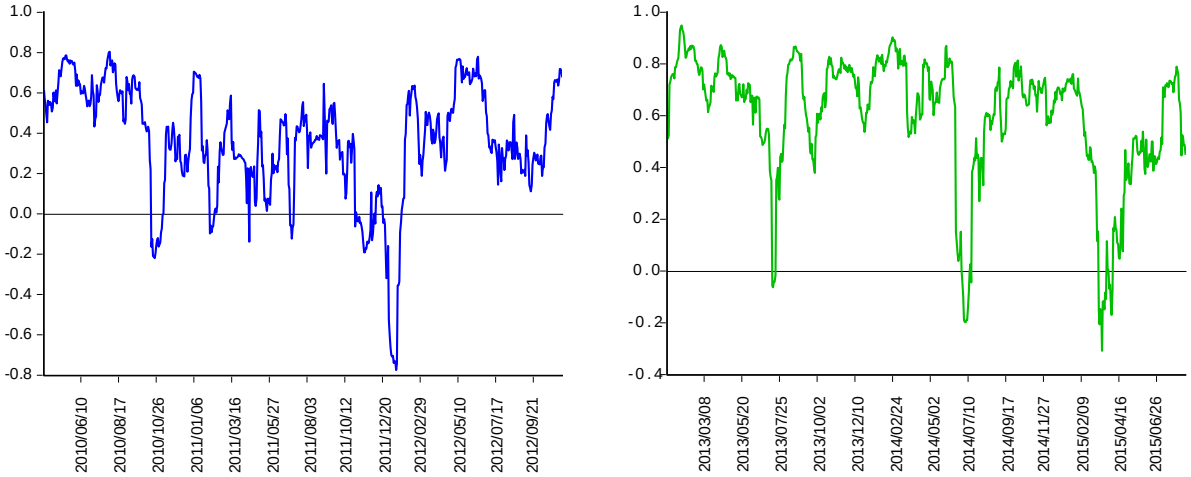


Figure 1. Time-series Evolution of the Time-varying Correlation Coefficients between the Changes of the yen/US dollar Exchange Rate and Four Japanese Stock Index Returns.

5. Empirical Results

First, Figure 1 shows the daily time-varying correlation coefficients with 20-days windows. In all panels, the correlations for the period from April 1, 2010 to November 13, 2012 are on the left side and correlations for the period from December 26, 2012 to August 18, 2015 are on the right side. Panels A−D of Figure 1 demonstrate that all four Japanese stock return variables of NK225LR, NK500LR, JASLR, and TC30LR show much higher time-varying correlations with the yen/dollar exchange rate changes in our recent sample period.

Next, estimation results of our four kinds of bivariate Bayesian VAR models are shown in Table 3. Specifically, in Table 3, Panel A presents the results for the period from April 1, 2010 to November 13, 2012 and Panel B exhibits the results for the period from December 26, 2012 to August 18, 2015. From Table 3, it is understood that, in Panel A, the lag variables of the exchange rate do not statistically significantly explain the future stock prices and the lag variables of stock prices do not statistically significantly explain the future exchange rate changes, either.

On the other hand, in Panel B of Table 3, the first lag variables of EX statistically significantly and positively explain the four stock index prices, NK225, NK500, JAS, and TC30. In addition, Panel B of Table 3 shows that the first lag variables of NK225, NK500, and TC30 also present some statistically significant explanatory power for the time-series evolution of the EX. However, we note that all the statistically significant coefficients of these three stock price lag variables take very small values.

Further, in order to judge the degrees of the above effects derived from the Bayesian VAR models, we depict mutual impulse response functions of EX, NK225, NK500, JAS, and TC30 in Figures 2 and 3. Figure 2 shows the responses for the period from April 1, 2010 to

November 13, 2012 and Figure 3 displays those for the period from December 26, 2012 to August 18, 2015. Figures 2 and 3 show that, in our first sample period, EX little responds to the shock in stock prices and only two stock prices of NK225 and NK500 respond to the shock in EX. As for our recent sample period, EX again little responds to the shock in stock prices while all four stock prices of NK225, NK500, JAS, and TC30 positively respond to the shock in EX strongly. Hence the above results clearly demonstrate that, recently, the past yen/dollar exchange rate time-series affect the evolution of the Japanese stock prices much strongly. On the other hand, the past series of the Japanese stock index prices little affect the evolution of the yen/dollar exchange rate in our two sample periods.

Table 3. Estimation results of the bivariate Bayesian VAR models

Panel A. Results for the period from April 1, 2010 to November 13, 2012					
Model 1			Model 2		
	EX	NK225		EX	NK500
EX(−1)	0.7939***	9.9645	EX(−1)	0.7964***	0.6037
p-value	0.0000	0.2516	*p*-value	0.0000	0.3647
EX(−2)	0.1297***	−15.8599*	EX(−2)	0.1280***	−1.0464
p-value	0.0001	0.0727	*p*-value	0.0001	0.1241
EX(−3)	0.0487*	5.5146	EX(−3)	0.0476*	0.4266
p-value	0.0584	0.4137	*p*-value	0.0639	0.4112
EX(−4)	0.0115	1.4078	EX(−4)	0.0114	0.1358
p-value	0.5617	0.7864	*p*-value	0.5638	0.7342
NK225(−1)	0.0002	0.8904***	NK500(−1)	0.0017	0.8973***
p-value	0.1915	0.0000	*p*-value	0.2884	0.0000
NK225(−2)	0.0001	0.0711**	NK500(−2)	0.0020	0.0534
p-value	0.4409	0.0391	*p*-value	0.2261	0.1203
NK225(−3)	−0.0001	0.0208	NK500(−3)	−0.0016	0.0229
p-value	0.2212	0.4188	*p*-value	0.2084	0.3714
NK225(−4)	−0.0001	−0.0115	NK500(−4)	−0.0017*	−0.0073
p-value	0.1114	0.5578	*p*-value	0.0662	0.7095
Intercept	1.0654***	185.8677**	Intercept	1.0267***	17.0981**
p-value	0.0024	0.0445	*p*-value	0.0040	0.0187
$Adj.R^2$	0.9881	0.9671	$Adj.R^2$	0.9882	0.9643
Model 3			Model 4		
	EX	JAS		EX	TC30
EX(−1)	0.7996***	0.0443	EX(−1)	0.7885***	0.4576
p-value	0.0000	0.1409	*p*-value	0.0000	0.2402
EX(−2)	0.1305***	−0.0468	EX(−2)	0.1295***	−0.6815*
p-value	0.0001	0.1320	*p*-value	0.0001	0.0852

EX(−3)	0.0460*	0.0062	EX(−3)	0.0486*	0.1416
p-value	0.0712	0.7936	*p*-value	0.0585	0.6398
EX(−4)	0.0107	−0.0008	EX(−4)	0.0120	0.0762
p-value	0.5868	0.9662	*p*-value	0.5444	0.7440
JAS(−1)	0.0337	1.0553***	TC30(−1)	0.0042	0.9305***
p-value	0.2868	0.0000	*p*-value	0.1127	0.0000
JAS(−2)	0.0444	−0.0696**	TC30(−2)	0.0021	0.0539
p-value	0.2296	0.0464	*p*-value	0.4686	0.1193
JAS(−3)	−0.0461*	−0.0186	TC30(−3)	−0.0026	0.0174
p-value	0.0879	0.4653	*p*-value	0.2339	0.4991
JAS(−4)	−0.0351*	−0.0003	TC30(−4)	−0.0029*	−0.0130
p-value	0.0755	0.9889	*p*-value	0.0734	0.5029
Intercept	1.2065***	1.4407***	Intercept	1.3318***	5.0867
p-value	0.0092	0.0009	*p*-value	0.0008	0.2785
Adj. R^2	0.9883	0.9607	*Adj*. R^2	0.9882	0.9873

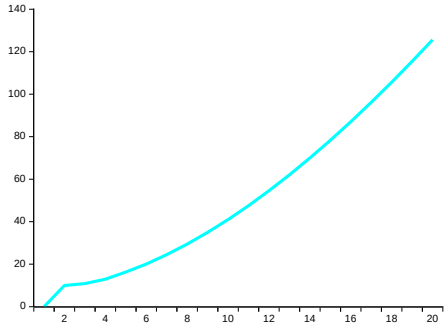
Panel B. Results for the period from December 26, 2012 to August 18, 2015

Model 1			Model 2		
	EX	NK225		EX	NK500
EX(−1)	0.8574***	29.8981***	EX(−1)	0.8532***	2.1732**
p-value	0.0000	0.0085	*p*-value	0.0000	0.0118
EX(−2)	0.0941***	−17.8033	EX(−2)	0.0932***	−1.5014*
p-value	0.0076	0.1192	*p*-value	0.0078	0.0848
EX(−3)	0.0276	−0.4285	EX(−3)	0.0269	0.0084
p-value	0.2939	0.9599	*p*-value	0.3053	0.9898
EX(−4)	0.0160	−3.3490	EX(−4)	0.0152	−0.2194
p-value	0.4220	0.6048	*p*-value	0.4440	0.6577
NK225(−1)	0.0002**	0.8155***	NK500(−1)	0.0034**	0.8593***
p-value	0.0314	0.0000	*p*-value	0.0145	0.0000
NK225(−2)	−0.0001	0.1338***	NK500(−2)	−0.0012	0.1055***
p-value	0.4746	0.0001	*p*-value	0.4077	0.0027
NK225(−3)	−0.0001	0.0025	NK500(−3)	−0.0016	0.0016
p-value	0.1081	0.9242	*p*-value	0.1206	0.9507
NK225(−4)	−1.79E−05	0.0131	NK500(−4)	−0.0002	0.0136
p-value	0.7690	0.5152	*p*-value	0.7765	0.4941
Intercept	0.4300	−316.5553**	Intercept	0.7726	−20.3306
p-value	0.3605	0.0397	*p*-value	0.1393	0.1204
Adj. R^2	0.9960	0.9935	*Adj*. R^2	0.9960	0.9958

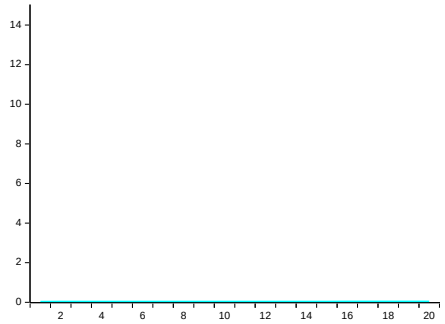
Model 3			Model 4		
	EX	JAS		EX	TC30
EX(−1)	0.8858***	0.1348**	EX(−1)	0.8530***	1.3556***
p-value	0.0000	0.0115	*p*-value	0.0000	0.0027
EX(−2)	0.0862**	−0.0730	EX(−2)	0.0971***	−0.8260*
p-value	0.0118	0.1966	*p*-value	0.0056	0.0687
EX(−3)	0.0177	−0.0303	EX(−3)	0.0310	−0.1211
p-value	0.4912	0.4763	*p*-value	0.2389	0.7218
EX(−4)	0.0114	−0.0113	EX(−4)	0.0187	−0.1568
p-value	0.5627	0.7277	*p*-value	0.3509	0.5450
JAS(−1)	0.0156	0.9835***	TC30(−1)	0.0065**	0.8806***
p-value	0.4061	0.0000	*p*-value	0.0137	0.0000
JAS(−2)	−0.0147	−0.0181	TC30(−2)	−0.0029	0.0844**
p-value	0.4825	0.6046	*p*-value	0.2908	0.0173
JAS(−3)	−0.0112	−0.0065	TC30(−3)	−0.0035*	−0.0145
p-value	0.4648	0.7990	*p*-value	0.0762	0.5812
JAS(−4)	0.0073	0.0187	TC30(−4)	−0.0004	0.0161
p-value	0.5183	0.3226	*p*-value	0.7901	0.4150
Intercept	0.2496	0.1536	Intercept	0.2638	−3.9765
p-value	0.3704	0.7406	*p*-value	0.4037	0.3344
Adj. R^2	0.9960	0.9937	*Adj*. R^2	0.9960	0.9911

Notes: This table shows the estimation results of our four kinds of Bayesian VAR(4) models for the exchange rate and stock price series in Japan. In this table, EX denotes the level variable of the yen/dollar exchange rate, NK225 means the level variable of the Nikkei 225 stock index, NK500 means the level variable of the Nikkei 500 stock index, JAS denotes the level variable of the JASDAQ stock index, and TC30 represents the level variable of the TOPIX Core 30 stock index in Japan. Further, the adjusted *R*-squared value is denoted by *Adj*. R^2 and ***, **, and * represent the statistical significance of the coefficients at the 1, 5, and 10% levels, respectively.

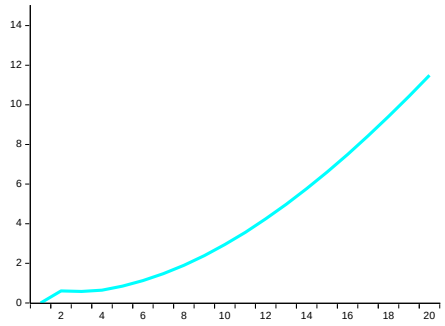
Panel A. Response of NK225 to EX



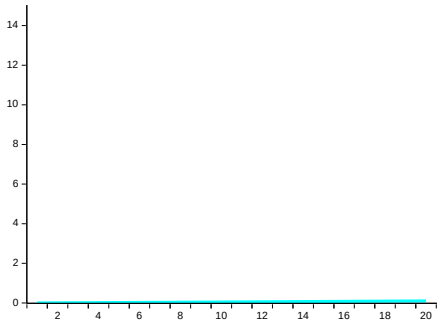
Panel B. Response of EX to NK225



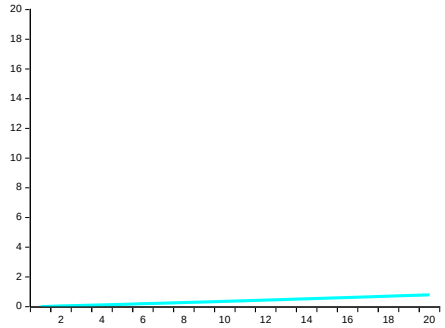
Panel C. Response of NK500 to EX



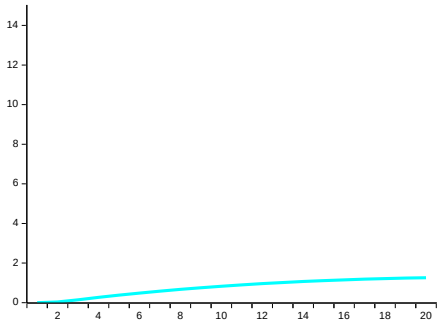
Panel D. Response of EX to NK500



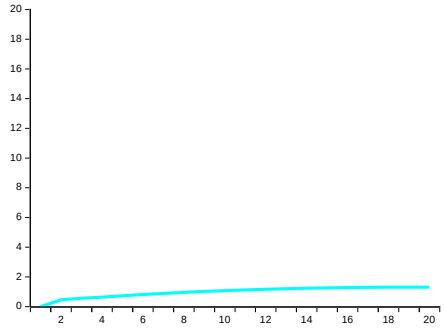
Panel E. Response of JAS to EX



Panel F. Response of EX to JAS



Panel G. Response of TC30 to EX



Panel H. Response of EX to TC30

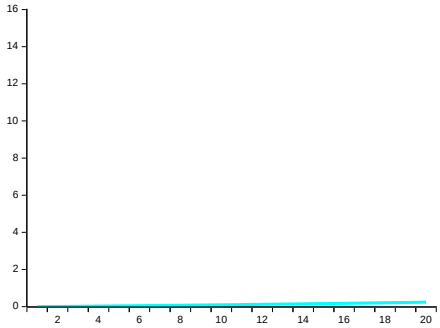
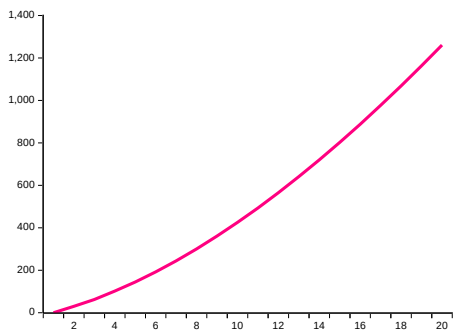
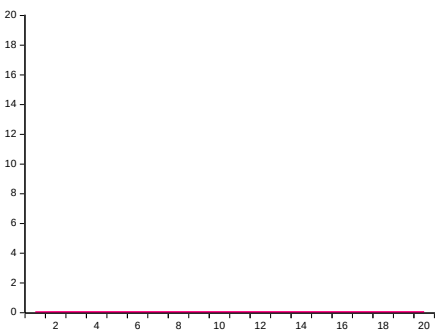


Figure 2. Accumulated Mutual Impulse Responses of Stock Prices and Exchange Rates: Results for the period from April 1, 2010 to November 13, 2012.

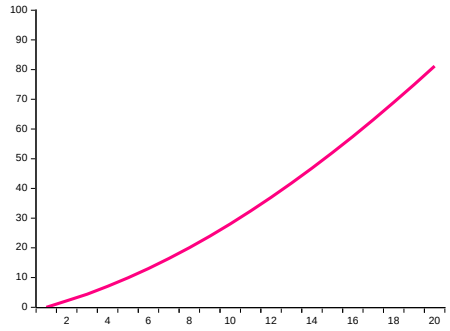
Panel A. Response of NK225 to EX



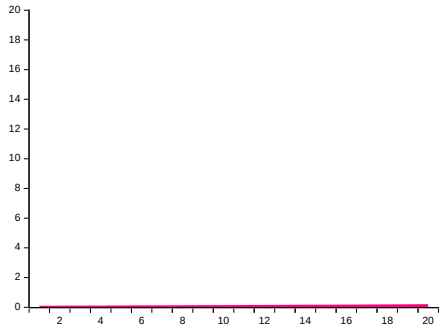
Panel B. Response of EX to NK225



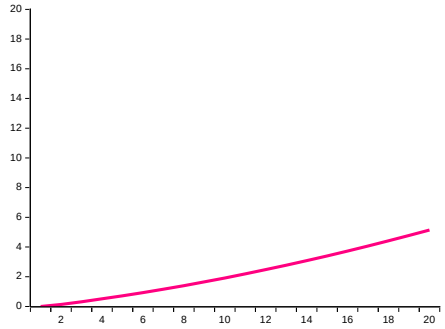
Panel C. Response of NK500 to EX



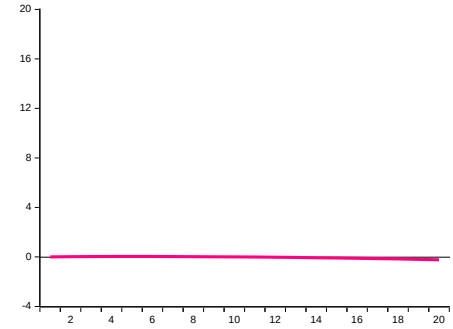
Panel D. Response of EX to NK500



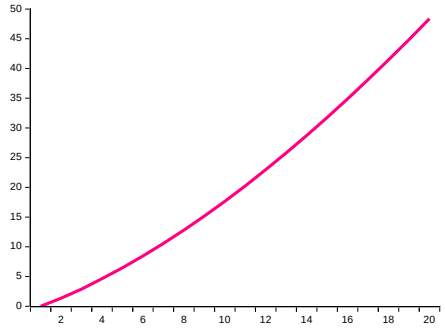
Panel E. Response of JAS to EX



Panel F. Response of EX to JAS



Panel G. Response of TC30 to EX



Panel H. Response of EX to TC30

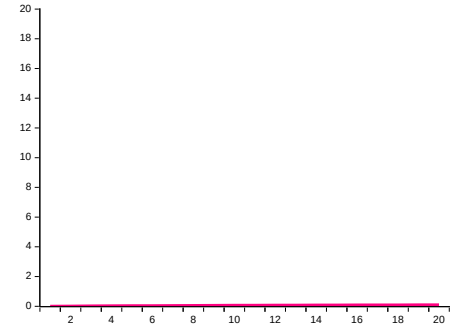


Figure 3. Accumulated Mutual Impulse Responses of Stock Prices and Exchange Rates: Results for the period from December 26, 2012 to August 18, 2015.

6. Conclusions

This paper examined the recent relations among the yen/dollar exchange rate and stock prices in Japan. Using bivariate Bayesian VAR models, we derived several interesting findings as follows. First, 1) our analyses by Bayesian VAR models clarified that recently, the first daily lag variables of the yen/dollar exchange rate were statistically significant in explaining the evolution of the Nikkei 225, Nikkei 500, JASDAQ, and TOPIX Core 30 stock price indices in Japan.

In addition, 2) our impulse response analyses revealed that, in the recent years, the yen/dollar

exchange rate little responded to the past stock prices whilst stock prices strongly responded to the yen/dollar exchange rate changes. As above our examinations demonstrate, recently, the past yen/dollar exchange rate time-series affected the evolution of the Japanese stock prices much more strongly whilst the past Japanese stock price series still had little effect on the yen/dollar exchange rate changes.

Furthermore, 3) by analyzing the correlation coefficients between the yen/dollar exchange rate changes and stock returns in Japan, we also found that, recently, daily contemporaneous correlations between exchange rate changes and Japanese stock returns largely increased. The above evidence observed particularly in the recent years in Japan may be mainly because of the recent quantitative easing monetary policy executed by the Bank of Japan. Thus further related analysis by using other methodology and other viewpoints is one of our future tasks.

Acknowledgement

I am particularly grateful to the repeated kind invitation from the journal to write to this journal. I also appreciate the Zengin Foundation for Studies on Economics and Finance for their grant-in-aid to this research. Further, I am grateful to the Japan Society for the Promotion of Science for their generous financial assistance to my research. Moreover, I thank the anonymous referees of this journal for their comments on this paper. Furthermore, I thank Jessica Caroline for the kindness to my paper. Finally, I deeply thank all the Editors of this journal for their kindness to my paper.

References

Abouwafia, H. E., & Chambers, M. J. (2015). Monetary policy, exchange rates and stock prices in the Middle East region. *International Review of Financial Analysis*, *37*, 14-28. http://dx.doi.org/10.1016/j.irfa.2014.11.001

Aktuğ, R. E. (2015). Empirical dynamics of emerging financial markets during the global mortgage crisis. *Borsa İstanbul Review*, *15*, 17-36. http://dx.doi.org/10.1016/j.bir.2014.11.001

Caporale, G. M., Hunter, J., & Ali, F. M. (2014). On the linkages between stock prices and exchange rates: Evidence from the banking crisis of 2007-2010. *International Review of Financial Analysis*, *33*, 87-103. http://dx.doi.org/10.1016/j.irfa.2013.12.005

Dellas, H., & Tavlas, G. (2013). Exchange rate regimes and asset prices. *Journal of International Money and Finance*, *38*, 85-94. http://dx.doi.org/10.1016/j.jimonfin.2013.05.008

Du, D. (2014). Persistent exchange-rate movements and stock returns. *Journal of International Financial Markets, Institutions & Money*, *28*, 36-53. http://dx.doi.org/10.1016/j.intfin.2013.10.007

Gelman, M., Jochem, A., Reitz, S., & Taylor, M. P. (2015). Real financial market exchange rates and capital flows. *Journal of International Money and Finance*, *54*, 50-69. http://dx.doi.org/10.1016/j.jimonfin.2015.02.004

Ho, L. C., & Huang, C. H. (2015). The nonlinear relationships between stock indexes and exchange rates. *Japan and the World Economy*, *33*, 20-27. http://dx.doi.org/10.1016/j.japwor.2015.02.002

Kal, S. H., Arslaner, F., & Arslaner, N. (2015). The dynamic relationship between stock, bond and foreign exchange markets. *Economic Systems*, forthcoming. http://dx.doi.org/doi:10.1016/j.ecosys.2015.03.002

Litsios, I. (2013). Exchange rate determination and equity prices: Evidence from the UK. *The Journal of Economic Asymmetries*, *10*, 115-128. http://dx.doi.org/10.1016/j.jeca.2014.01.002

Merton, R. C. (1973). An intertemporal capital asset pricing model. *Econometrica*, *41*, 867-887.

Śmiech, S., & Papież, M. (2013). Fossil fuel prices, exchange rate, and stock market: A dynamic causality analysis on the European market. *Economics Letters*, *118*, 199-202. http://dx.doi.org/doi:10.1016/j.econlet.2012.10.010

Tsagkanos, A., & Siriopoulos, C. (2013). A long-run relationship between stock price index and exchange rate: A structural nonparametric cointegrating regression approach. *Journal of International Financial Markets, Institutions & Money*, *25*, 106-118. http://dx.doi.org/10.1016/j.intfin.2013.01.008

Copyright Disclaimer