

THE DAY-OF-THE-WEEK AND MONTH-OF-THE-YEAR EFFECTS AFTER THE U.S. RECESSION: CONVERTING SELECTED FOREIGN CURRENCIES TO THE PHILIPPINE PESO

Catherine Kalayaan S. Almonte
De La Salle University, Manila, Philippines

E-mail: catherine.almonte@dlsu.edu.ph

ABSTRACT

The proponent studied the day-of-the-week and month-of-the-year effects as applied to changes in foreign currency values for the period July 2009 to October 2012. Various currencies were used in this paper: the United Arab Emirates' Dirham (AED), Canadian Dollar (CAD), British Pound (GBP), Japanese Yen (JPY), Saudi Arabian Rial (SAR), Singapore Dollar (SGD), and the United States (U.S.) Dollar (USD). The foreign currencies' converted values to the Philippine Peso (PHP; retrieved from Bloomberg L.P.) were used and the changes in their values were determined. The changes in the currency values were then tested if they showed either the day-of-the-week and/or the month-of-the-year effects. According to the results, only the CAD to PHP and SAR to PHP (at $\alpha = 0.05$), AED to PHP and JPY to PHP (at $\alpha = 0.10$) had the day-of-the-week effect while the month-of-the-year effect was missing.

Keywords: day-of-the-week effect, month-of-the-year effect, foreign exchange markets, exchange rates

1. INTRODUCTION

1.1. Overview

Many Filipinos work in other countries. Remittances considerably contribute to the Philippines' gross domestic product (Metriyakool, 2011, July 28; Dumlao, 2012, October 16).

According to the Bangko Sentral ng Pilipinas (2012, November 15), "By source country, the U.S., Canada, Saudi Arabia, Japan, the U.K., United Arab Emirates, and Singapore remained the top sources of cash remittances". Thus, the researcher used the exchange rates of these currencies to the Philippine Peso (PHP) as the sample data for this paper. The foreign

currencies included in the study were: the United Arab Emirates' Dirham (AED), Canadian Dollar (CAD), British Pound (GBP), Japanese Yen (JPY), Saudi Arabian Rial (SAR), Singapore Dollar (SGD), and the United States (U.S.) Dollar (USD). All seven currencies may be traded for the PHP (Bangko Sentral ng Pilipinas (Treasury Department), <http://www.bsp.gov.ph/statistics/sdds/exchrates.htm>, 2012, November 27).

One of the basic notions of foreign exchange is that from the perspective of the individual exchanging the foreign currency to the local currency (in this case, the PHP), a PHP depreciation is desirable because he can get more PHP for his foreign currency. Conversely, for that same person, a PHP appreciation would be

undesirable since he will get less PHP for his foreign currency. Hence, timing one's changing of foreign currency to the PHP is a must (similar to what was said by Almonte (2004; 2012a; 2012b; 2012c) regarding different assets).

The day-of-the-week and month-of-the-year effects were studied to find out if one needs to time his foreign currency transactions. Hence, motivated by the researches of C. Vieira & I. Vieira (2007), Olowe (2011), Ferraro & Powell (2009), and Li, Liu, Bianchi, & Su (2011), two hypotheses were constructed:

Hypothesis 1 The AED to PHP, CAD to PHP, GBP to PHP, JPY to PHP, SAR to PHP, SGD to PHP, and USD to PHP show confirmation of the day-of-the-week effect.

Hypothesis 2 The AED to PHP, CAD to PHP, GBP to PHP, JPY to PHP, SAR to PHP, SGD to PHP, and USD to PHP show confirmation of the month-of-the-year effect.

Almonte's (2004; 2012b) operational definitions for the day-of-the-week effect and Almonte's (2012b) operational definition for the month-of-the-year effect were employed in this study.

1.2. Literature

Inspired by C. Vieira & I. Vieira (2007), who mainly cited literature involving calendar effects relating to foreign currencies, literature was limited to the day-of-the-week and month-of-the-year effects focusing on foreign currency(ies).

1.2.1. Day-of-the-Week Effect

C. Vieira & I. Vieira (2007) researched on the day-of-the-week effect by using the Czech Republic's Koruna (CZK), Hungary's Forint

(HUF), and Poland's Zloty (PLN) versus the USD. According to them, "... statistically significant coefficients occur only in Poland, where a day-of-the-week effect emerges on Tuesdays, Wednesdays, and Thursdays for the whole sample and for the second subperiod" (C. Vieira & I. Vieira, 2007, p. 290).

In contrast, Olowe (2011) studied the day-of-the-week effect in the Nigerian setting. According to the results of Olowe's (2011, p. 145) research, there was an "... absence of the day-of-the-week effect in the exchange rate return equation but not in the volatility equation".

Based on the cited literature, the day-of-the-week effect involving different currencies may or may not be present (in line with Almonte's (2012a; 2012b) observation of the literature on the day-of-the-week effect involving equities; note: other researches on the day-of-the-week effect involving equities also yielded dissimilar results – these can be found in Almonte (2004)).

1.2.2. Month-of-the-Year Effect

In their study, Ferraro & Powell (2009) noted that it is challenging to find opportunities involving calendar anomalies in currency trading.

On the other hand, Li, et al. (2011) found relationships in some of the currencies (i.e. Australian Dollar (AUD), Swiss Franc (CHF), Euro (EUR), GBP, and Swedish Krona (SEK)) included in their research.

In line with the researcher's comment regarding the day-of-the-week effect literature, according to the cited literature (i.e. Ferraro & Powell, 2009; Li, et al., 2011), the month-of-the-year effect involving different currencies may or may not exist (similar with Almonte's (2012b) comment regarding the literature on the month-of-the-year effect involving equities).

2. METHODOLOGY

Daily exchange rates of the different currencies (i.e. AED, CAD, GBP, JPY, SAR, SGD, and USD) to the PHP were retrieved from Bloomberg L.P.

This study covered the changes in the values of the various exchanges rates for the period July 2009 until October 2012 because, as per the National Bureau of Economic Research ((n.d.); as cited in the U.S. Bureau of Labor Statistics, 2012 February), the latest recession started on the last month of 2007 and lasted until the first half of 2009.

XLSTAT 2011, also used by Almonte (2012a; 2012b; 2012c), was the software that was employed in all statistical tests.

The changes in the currency values violated the normal distribution pattern (Table 1). As such, following Almonte (2004; 2012b), non-parametric tests were applied.

The author primarily relied on the methodologies applied by Almonte (2004; 2012b) for the day-of-the-week effect and depended on the methodology used by Almonte (2012b) for the month-of-the-year effect.

Currencies	df	JB (Observed Value)	p-value (two-tailed)
AED to PHP	2	148.404	< 0.0001
CAD to PHP	2	41.519	< 0.0001
GBP to PHP	2	36.906	< 0.0001
JPY to PHP	2	915.624	< 0.0001
SAR to PHP	2	109.446	< 0.0001
SGD to PHP	2	290.758	< 0.0001
USD to PHP	2	13.620	0.001

Note: Format of Table 1 was adapted from “The day-of-the-week effect in selected balanced funds in the Philippines” by C.K.S. Almonte, 2012a, *International Journal of Information Technology and Business Management*, 3(1), pp. 42-43 (Copyright 2012 by JITBM and ARF); “Calendar effects in the Philippine stock market” by C.K.S. Almonte, 2012b, *International Journal of Information Technology and Business Management*, 3(1), p. 68 (Copyright 2012 by JITBM and ARF); and “Testing for the quarter-of-the-year effect in ten Asian stock indices” by C.K.S. Almonte, 2012c, *International Journal of Information Technology and Business Management*, 6(1), p. 33 (Copyright 2012 by JITBM and ARF).

3. RESULTS AND DISCUSSION

Only the CAD to PHP and SAR to PHP had the day-of-the-week effect at the 95% confidence level (Table 2). The results were similar with the research findings of C. Vieira & I. Vieira (2007).

The Steel-Dwass-Critchlow-Fligner Method recognized which days were troughs and which days were peaks (Almonte 2012a; 2012b). Friday and Wednesday were the troughs while Monday was the peak (Table 3; AED to PHP, CAD to PHP, JPY to PHP, and SAR to PHP).

Points of interest were the AED to PHP and JPY to PHP. Although the Kruskal-Wallis Test (Table 2) showed that the day-of-the-week effect was not present in both cases (at the 95% confidence level), the mean of ranks (Table 3)

showed otherwise. Perhaps, the existence of the significantly different days had something to do with them almost exhibiting the day-of-the-week effect (Table 2) – as such, the first hypothesis was tested again but the confidence level was changed to 90%. At the relaxed confidence level, the AED to PHP and JPY to PHP showed the day-of-the-week effect (Note: The statistical results were the same with those in Table 2 except for the $\alpha = 0.10$ and the K (critical value) = 7.779).

The month-of-the-year effect was missing (Table 4). One would be indifferent with regards to which month to exchange their foreign currency to the PHP. The results were similar to what was found out by Ferraro & Powell (2009).

Currencies	df	K (Observed Value)	Asymptotic <i>p</i> -value (two-tailed)
AED to PHP	4	9.347	0.053
CAD to PHP	4	14.690	0.005
GBP to PHP	4	5.861	0.210
JPY to PHP	4	9.311	0.054
SAR to PHP	4	14.402	0.006
SGD to PHP	4	4.525	0.340
USD to PHP	4	3.881	0.422

Note: Format of Table 2 was adapted from “The day-of-the-week effect in selected balanced funds in the Philippines” by C.K.S. Almonte, 2012a, *International Journal of Information Technology and Business Management*, 3(1), p. 46 (Copyright 2012 by JITBM and ARF); and “Calendar effects in the Philippine stock market” by C.K.S. Almonte, 2012b, *International Journal of Information Technology and Business Management*, 3(1), p. 70 (Copyright 2012 by JITBM and ARF).

Currencies	Monday	Tuesday	Wednesday	Thursday	Friday	<i>p</i> -value (two-tailed)
AED to PHP	482.026	425.555	426.423	442.307	403.744	0.026 (for the Monday and Friday values)
CAD to PHP	487.170	438.621	439.034	430.963	384.195	0.002 (for the Monday and Friday values)
GBP to PHP	460.753	420.138	436.474	456.052	406.580	Note: There was no significant difference among the days.
JPY to PHP	479.977	425.408	401.846	445.621	427.345	0.025 (for the Monday and Wednesday values)
SAR to PHP	492.891	426.480	414.903	446.609	399.239	0.003 (for the Monday and Friday values); 0.046 (for the Monday and Wednesday values)
SGD to PHP	445.443	439.971	405.097	459.402	430.264	Note: There was no significant

						difference among the days.
USD to PHP	437.042	402.066	400.912	424.068	392.574	Note: There was no significant difference among the days.

Note: Format of Table 3 was adapted from “The day-of-the-week effect in selected balanced funds in the Philippines” by C.K.S. Almonte, 2012a, *International Journal of Information Technology and Business Management*, 3(1), pp. 47-48 (Copyright 2012 by JITBM and ARF); and “Calendar effects in the Philippine stock market” by C.K.S. Almonte, 2012b, *International Journal of Information Technology and Business Management*, 3(1), pp. 70-72 (Copyright 2012 by JITBM and ARF).

Table 4 KRUSKAL-WALLIS TEST FOR THE MONTH-OF-THE-YEAR EFFECT at $\alpha = 0.05$; K (Critical Value) = 19.675			
Currencies	df	K (Observed Value)	Asymptotic p-value (two-tailed)
AED to PHP	11	15.062	0.180
CAD to PHP	11	6.051	0.870
GBP to PHP	11	4.219	0.963
JPY to PHP	11	15.460	0.162
SAR to PHP	11	11.503	0.402
SGD to PHP	11	2.001	0.998
USD to PHP	11	14.205	0.222

Note: Format of Table 4 was adapted from “Calendar effects in the Philippine stock market” by C.K.S. Almonte, 2012b, *International Journal of Information Technology and Business Management*, 3(1), p. 75 (Copyright 2012 by JITBM and ARF); and “Testing for the quarter-of-the-year effect in ten Asian stock indices” by C.K.S. Almonte, 2012c, *International Journal of Information Technology and Business Management*, 6(1), p. 34 (Copyright 2012 by JITBM and ARF).

4. CONCLUSIONS AND RECOMMENDATIONS

The first research hypothesis was only supported by the results of the CAD to PHP and SAR to PHP (at the 95% confidence level), AED to PHP and JPY to PHP (at the 90% confidence level). However, since no significant *p*-values were found for the month-of-the-year effect (AED to PHP, CAD to PHP, GBP to PHP, JPY to PHP,

SAR to PHP, SGD to PHP, and USD to PHP), one can conclude that the second research hypothesis was not supported.

Looking ahead, researchers may wish to use different currencies and/or methodologies to establish if certain calendar anomalies are there.

5. REFERENCES

1. Al
2. monte, C.K.S. (2004). The day-of-the-week effect in the Philippine stock market January 3, 2000 to July 23, 2004. Retrieved January 7, 2012, from <http://www.dlsu.edu.ph/research/centers/cberd/pdf/papers/Working%20Paper%20Series%202004-10.pdf>.
3. Almonte, C.K.S. (2012a). The day-of-the-week effect in selected balanced funds in the Philippines. *International Journal of Information Technology and Business Management*, 3(1). Retrieved on October 12, 2012, from <http://www.jitbm.com/volume3/Day-of-the-Week%20Effect%20in%20Selected%20Balanced%20Funds%20in%20the%20Philippines%20-%20JITBM%20.pdf>
4. Almonte, C.K.S. (2012b). Calendar effects in the Philippine stock market. *International Journal of Information Technology and Business Management*, 3(1). Retrieved on October 12, 2012, from <http://www.jitbm.com/volume3/Calendar%20Effects%20in%20the%20Philippine%20Stock%20Market%20-%20JITBM.pdf>.
5. Almonte, C.K.S. (2012c). Testing for the quarter-of-the-year effect in ten Asian stock indices. *International Journal of Information Technology and Business Management*, 6(1). Retrieved on November 16, 2012, from <http://www.jitbm.com/6thVolumeJITBM/catherine.pdf>.
6. Bangko Sentral ng Pilipinas. (2012, November 15). *Personal remittances continue to rise in September*. Retrieved on November 16, 2012, from <http://www.bsp.gov.ph/publications/media.asp?id=3044>.
7. Bangko Sentral ng Pilipinas (Treasury Department). (2012, November 27). Reference exchange rate bulletin. Retrieved on November 27, 2012, from <http://www.bsp.gov.ph/statistics/sdds/exchrate.htm>.
8. Bloomberg, L.P. Data for various exchange rates to the Philippine Peso. Retrieved on November 2012 from a Bloomberg terminal.
9. Dumlao, D.C. (2012, October 16). *HSBC says remittances give BSP room to hold interest rates*. Philippine Daily Inquirer. Retrieved on January 2, 2013, from <http://business.inquirer.net/87610/hsbc-says-remittances-give-bsp-room-to-hold-interest-rates>.
10. Ferraro, S.R. & Powell, R.W. (2009). An initial examination of seasonality in foreign exchange markets. *Journal of Global Business Issues*, 3(2), 33-38. Retrieved on November 17, 2012 from ProQuest Central.
11. Li, B., Liu, B., Bianchi, R., & Su, J.J. (2011). Monthly seasonality in currency returns: 1972-2010. *JASSA The Finsia Journal of Applied Finance*, No. 3, 6-11. Retrieved on November 17, 2012 from ProQuest.
12. Metriyakool, D. (2011, July 28). *Continued reliance on remittances stress the need for Philippines to focus on domestic job creation*. RGE Analysts Blog. Retrieved on January 2, 2013, from <http://www.economonitor.com/analysts/2011/07/28/continued-reliance-on-remittances-stress-the-need-for-philippines-to-focus-on-domestic-job-creation/>.
13. Olowe, R.A. (2011). Exchange rate volatility, global financial crisis and the day-of-the-week effect. *KJBM*, 3(3). Retrieved on November 15, 2012, from <http://www.ajol.info/index.php/kjbm/article/viewFile/72101/61044>.
14. U.S. Bureau of Labor Statistics. (2012, February). The recession of 2007-2009. BLS Spotlight on Statistics. Retrieved on November 15, 2012, from http://www.bls.gov/spotlight/2012/recession/pdf/recession_bls_spotlight.pdf.

15. Vieira, C. & Vieira, I. (2007). Seasonalities in eastern foreign exchange markets: A barrier to Euro adoption? *Transition Studies Review*, 14(2). Retrieved on November 15, 2012, from <http://dspace.uevora.pt/rdpc/bitstream/10174/3053/1/fulltext.pdf>.
16. XLSTAT 2011 [Computer software]. Statistical software used for all statistical tests. A version of the software is available from <http://www.xlstat.com/en/download.htm>