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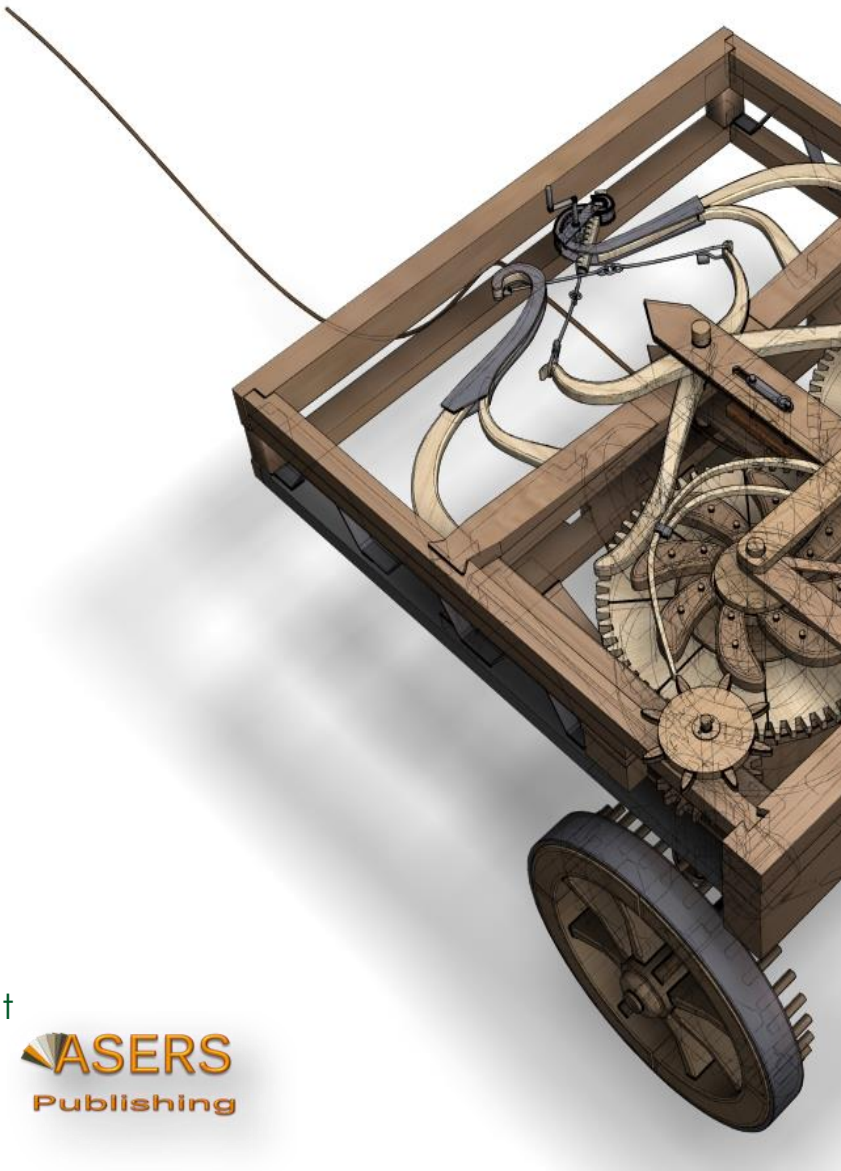

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Do Tourist Arrivals Contribute to the Stable Exchange Rate? Evidence from Indonesia

Haryo KUNCORO
Faculty of Economics, State University of Jakarta, Indonesia
har_kun@feunj.ac.id

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Abstract

The impact of exchange rate on tourism arrivals fluctuation has been well accepted in the frame work of demand function. However, literature on the influence of tourism arrivals on exchange rate stabilization revealed inconclusive.

This paper attempts to analyze the economic importance of international tourism arrivals in Indonesia based on the question of whether tourism arrivals contribute to stabilize exchange rate. Estimation of monthly time series data for the period of 2004-13 presents that Hedrick-Prescott filtered cyclical components of tourism arrivals and exchange rate are co-integrated and bi-directional Granger-causality. The results of VAR present that cyclical characteristics of tourism arrivals are pro-cyclical to exchange rate implying that the increase in tourism arrivals induce the destination currency appreciation. These results indicate that tourism arrivals are sustainable inflow and have a big potency to absorb other external funding resources volatility in order to maintain adequate international reserve and therefore contribute to achieve the stable exchange rate. In such a case, improving the competitiveness of tourism sector should be an integral part of the exchange rate stabilization program.

Keywords: tourism, exchange rate, cyclicality, VAR, impulse response.

JEL Classification: C22, E32, F31, G18.

1. Introduction

Over the past three decades, tourism has experienced continued expansion and diversification, becoming one of the largest and fastest-growing economic sectors in the world. The international tourist arrivals have shown virtually uninterrupted growth – from 277 million in 1980 to 528 million in 1995 and 983 million people in 2011. The number of international tourist arrivals worldwide is expected to increase by 3.3% a year on average from 2010 to 2030 reaching a total of 1.8 billion arrivals by 2030 (UNWTO, 2012).

The international tourism receipts for 2011 are estimated at US$ 1,030 billion worldwide, up from US$ 928 billion in 2010, setting new records in most destinations despite economic challenges in many source markets. As a result, tourism's contribution to worldwide gross domestic product (GDP) is estimated at some 5 percent. Tourism's contribution to employment tends to be slightly higher and is estimated in the order of 6-7 percent of the overall number of jobs worldwide (UNWTO 2012). Given this rapid growth in international tourism, the tourist arrivals continue to be an importance issue for researchers and policy makers around the world. For policy maker's point of view, tourist arrivals represent a substantial flow of financial resources

predominantly to developing countries. Consequently, they are more reliable macroeconomic tool in the hands of policy makers. For researcher's point of view, this rapid growth in tourist arrivals is interesting because they tend to be more relatively stable and often counter-cyclical as source of external funding for developing countries compared to FDI (Foreign Direct Investment) and ODA (Official Development Aid). Therefore, international tourism acts as a significant macroeconomic stabilizer in the developing countries to provide sustainable support to the balance of payments and reduce reliance on external aid.

An emerging body of researches is devoted to analyze the fluctuation of tourism inflows in relation to balance of payment (Belloumi 2010, Lorde, Lowe, and Francis 2010, Malik *et al.* 2010, Cheng, Kim, and Thompson 2013), exchange rate (Balaguer and Cantavella-Jorda 2002, Gunduz and Hatemi 2005, Oh 2005), and in general economic growth (Dritsakis 2004, Ongon and Demiroz 2005, Cortes-Jimenez and Pulina 2006). Those studies found that inbound tourism are a significant source of foreign currency earner to promote economic growth seems to have become the received wisdom.

However, beyond the fluctuation, latest empirical literatures in developed and emerging countries concerning the volatility of tourist arrivals and exchange rate provide differing results (Ghartey 2010, Akar 2012, Chang and McAleer 2012, Naupane, Shrestha and Upadhyaya 2012), i.e. exchange rate volatility can have positive or negative effects on tourist arrivals. Even, tourist arrivals have positive impact on exchange rate (Nowjee *et al.* 2011, Tang 2011). While, Geyikdagi and Geyikdagi (1997) argued that tourism could play a stabilizing role in the flow of foreign currency receipts. Given the wide range of empirical results, there appears to be no clear consensus among research works on this issue.

In general those studies refer exclusively to long run aspects. The short run impact expressed by the cyclical fluctuations in tourism due to exchange rate has not been fully examined. A few papers have tried to explore the cyclical fluctuations in tourism but in the context of GDP (Gouveia and Rodrigues 2005, Eeckels, Filis and Leon 2006 Sergo and Poropat 2008). To our knowledge, no study has been conducted regarding the cyclical fluctuations of tourism and exchange rate and their possible interactions.

This paper contributes to the literature on exchange rate stabilization in the context of developing countries with focus on Indonesia. The motivation for this approach associates to the fact that Indonesia is a small-open economy in the international context so the scope for actively stabilizing international monetary condition remains limited. Moreover, based on the experience of dramatic depreciation in mid 1997, Indonesia consistently conducts some prudent macroeconomic policies to face possible depreciation in the medium term so it would be suboptimal to cut back international reserve to make more room for speculative attacks. Therefore, implementing pro-rebalancing monetary measures, such as increasing in the size of international reserve in order to stabilize exchange rate, is likely to require an increase in the size of the international tourism.

The rest of this paper is organized as follows. The next section explores the recent development of tourism in Indonesia. This is followed by exploring literature review. The methodological framework and the relevant data are delivered in the proceeding section; the penultimate section discusses empirical results; and the last section concludes and points to some directions for future research. Finally, some policy implications for Indonesia are also drawn.

2. Tourism development in Indonesia

As the largest archipelago country in the world, Indonesia is fortunate for having abundant stock of natural tourism products. Indonesia also has great attractions in the form of scenic beauty such as sun, ocean, mountains, flora and fauna, lakes, and in particular the hospitality of its people that may compel the tourists to visit. They have the opportunities to escape from the fretfulness and monotony of daily life and can relax in an ideal climate and perfect conditions.

Thousands islands and ethnics offer various rich cultural heritage uniqueness across region. Moreover, blend of old and modern civilizations has bestowed Indonesia a diverse topography, demography, culture, and traditions paving the way for investment in the tourism sector giving the strength to boost the economy. Those potential tourism objects should be exploited in a rational way to have some valuable economic benefits.

However, Indonesian tourism industry passed through its ups and downs, tourism demand being strongly affected by the economic, social, political, environmental factors (i.e. fall of older regime). Historically, starting in late 1960, Indonesian tourism industry entered in a new era in line with the New Order regime,

mostly marked by insignificant increased in tourism demand. Indonesian tourism market then became volatile and tourism demand more sensitive to market changes.

The absence of privatization, slow investments, low standard of living and purchasing power, poor management, and lack of the tourism policies accompanied by covered exchange rate system were few of the causes that have repressed substantially Indonesian tourism activity and tourism demand. The strategy to promote Indonesia's tourism offer at that time was not strongly enough to overcome the weakness of the already formed image of potential travelers. The important tour operators oriented to other tourism markets due to the low quality of services and the unbalance between prices and quality of tourism packages.

The little attention paid to the tourism industries was also probably associated with oil boom in 1970s. Coincidently, during the oil boom in 1970s the foreign debt increased unevenly. As one of the oil exporting countries (at that moment), Indonesia had a windfall profit as "collateral" to obtain new soft loans from creditor countries (Kuncoro 1997). The high foreign debt and oil revenue, in fact, had been the major foreign currency earner far enough from tourism receipt. Evidently, they successfully had been promoting economic growth. In that period, the economic growth rate booked the highest record, on the average 20% a year (Kuncoro 2011).

Serious and integrated efforts to develop this industry were only started in early 1980s as a consequence of the world economic recession. The sharp reduce in oil price, in one hand, and trade protection imposed by the most export destination countries, on the other hand, also tended to realize the importance of tourism sector in Indonesian economy. Since that, the government has been playing a very important role to stimulate the growth and development of the tourism industry. Institutionally, in 1982 the government had upgraded General Directorate of Tourism into State Ministry of Tourism, Post, and Telecommunication. Later reorganized Ministry of Tourism and Culture into the Ministry of Tourism and Creative Economy in 2011 to manage, monitor, synchronize, and ensure all tourism development activities and programs are in line with the National Tourism Development Master Plan.

At the same time, the "*Sapta Pesona*" (seven impressions toward tourists) program has been introduced to the society to stimulate tourism awareness. Also, various attractive incentives and assistances were given to private operators to encourage them to be directly involved in the tourism industry. The government was also allocated substantial amount of fund to this industry besides providing sufficient basic infrastructure. To further diversify the country of tourism origin, the government also involved in marketing by launching several Visit Indonesia Years.

As a result, in the last decade, tourism has been emerging as one of the major industries in Indonesia. This industry and other related sectors totally (directly and indirectly through multiplier effect) contributed 206.97 trillion Rupiah approximately 4% of GDP in 2011. In the same year, it absorbed 8.53 million workers (7.75% of national labor employment) and contributed to indirect tax revenue amounting 10.72 trillion Rupiah or equivalently 3.85% (National Tourism Satellite Account, Ministry of Tourism and Creative Economy, www.budpar.go.id accessed on December, 18, 2013).

Tourism revenues, as a consequence, have grown to the fifth largest industry after oil/natural gas, coal, palm oil, and manufactured rubber. This sector in 2011 generated US$ 8.6 billion of foreign currency supplied by more than 7.64 million inbound tourists. The number of tourists' journeys increased 2.5 million people since 2001 entered mainly through Denpasar, Jakarta, and Batam. It is predicted to reach more than 10 million visitors in 2015. Latest, the annual growth rate of tourism sector in the first nine months of 2013 was 8.80 percent; higher than the global growth rate of international tourism that was 5% (UNWTO 2013).

Within the regional tourism market, Indonesia cannot be considered as a new tourist destination. Table 1 clearly shows that traditionally Indonesia has been the big four of the most important market players in international tourist destination in South East Asia. In 2011, Indonesia controlled 9.4 and 3.5% of the South East Asia and Asia Pacific market share respectively (UNWTO 2012). It benefited from intraregional demand mostly from South East Asia (Singapore and Malaysia) and followed by Asia Pacific countries (prominently Australia, China, and Japan).

In the near future, however, Indonesia will face some treats in developing her tourism sector. In one hand, the main external challenge is the emerging new tourism destinations in the competing countries especially in South East Asia and Asia Pacific regions against the traditional ones of Bali, Java, and nearby islands. On the other hand, the internal obstacles primarily involve less diversified tourism destination and highly dependent on the availability of infrastructure, such as hotel, information, communication, and

transportation technologies. It is also highly vulnerable toward political turmoil as well as economic and social unrests (Wulandari 2012).

Table 1 - Tourist arrivals in ASEAN, 2008-2011 (in thousand people)

COUNTRY	2008	2009	2010	2011
Brunei Darussalam	225.8	157.5	214.3	242.1
Cambodia	2,125.5	2,161.6	2,508.3	2,881.9
Indonesia	6,429.0	6,323.7	7,002.9	7,649.7
Lao PDR	2,004.8	2,008.4	2,513.0	2,723.6
Malaysia	22,052.5	23,646.2	24,577.2	24,714.3
Myanmar	660.8	762.5	791.5	816.4
Philippines	3,139.4	3,017.1	3,520.5	3,917.5
Singapore	10,116.5	9,681.3	11,638.7	13,171.3
Thailand	14,597.5	14,149.8	15,936.4	19,098.3
Vietnam	4,253.7	3,772.3	5,049.9	6,014.0
ASEAN	65,605.5	65,680.3	73,752.6	81,229.0

***Source*:** ASEAN Tourism Statistics Database

3. Literature review

The international tourism and exchange rate relationship can be justified through various channels. The broader economic impact of international tourism in the destination country can be viewed by the number of tourist arrivals/departures, tourism receipts/expenditures, the number of overnight stays, the average length of stay (Witt and Song 2000, Ouerfelli 2008), tourism employment (Witt, Song, and Wanhill 2004), and tourism import and export (Smeral 2004). In the context of exchange rate, the two first seems to be the most relevant.

The simplest channel linking tourism arrivals and exchange rate is based on the conventional theory of demand. According to the neoclassical theory, the international tourism flows depend on the consumer's income, the relative price of the goods/services at the destination country compared to the host country, the prices of related goods/services (substitutes and complements), transportation cost, distance, neighboring country, qualitative factors in the country of origin or at the destination, and other demand shifters (see for example: Rosello, Aguilo and Riera 2005).

Regarding to the price of the goods/services consumed by tourists at the destination country, there are two measurements generally used by many researchers (see for example: Crouch 1993). The first indicator is that the tourism price is based on the consumer price index (CPI) of the visited country divided by the CPI of the country of origin. The demand theory hypothesizes that the demand for international tourism is an inverse function of relative prices, i.e., the lower the cost of living in the destination relative to the origin country, the greater the tourism demand and vice versa.

The second one is exchange rate. The exchange rate is a crucial determinant of tourism destination (Webber 2001). By definition, exchange rate is the ratio of currency between the receiving country and the country of origin. The change in exchange rate, as a component of the cost of living, will affect the currency value of the origin country. Any change in exchange rate will lead to an appreciation or depreciation of tourist currency (Salman 2003, Lim 2004, Dritsakis 2004, Toh, Habibullah and Goh 2006). In short, any appreciation in tourist currency (or depreciation currency in the destination country) may encourage more people to travel. Accordingly, the traditional theory of demand proposes exchange rate led to tourist arrivals hypotheses.

The second channel is in the opposite direction, i.e. tourism led to exchange rate hypotheses. How it is admitted fact on the all the hands that increase in tourism leads to balance of payments improvement through substantial reduction in current account deficit and then increase GDP growth. Eventually, the shift in foreign currency supply affects exchange rate appreciation (Obstfeld and Rogoff 1996).

However, the impact of tourism flows on exchange rate is ambiguous. In the first round, the enormity of the tourism flow may cause significant nominal exchange rate appreciation. It may further lower the external trade competitiveness of the country by increasing the relative price of non tradable to tradable (Poloodoo 2010). This, in turn, lowers the long run growth of the developing countries (Rodrik 2008). In a less diversified tradable sector with weak institutional supports, it reduces the diversification of the exported items (Obstfeld and Rogoff 1996). In the consecutive round, the increase in international tourist expenditures on

goods/services induces aggregate demand in the destination country. Because the aggregate supply is inelastic, this, in turn, drives up the domestic price level. Furthermore, the increase in inflation rate along with lower export revenues and then followed by lower economic growth cause the nominal exchange rate depreciation. Thus, the tourism flow carries "Dutch disease" effect on the visited country, appreciating at first but depreciating overtime*). This situation is similar to the J-curve idea in the opposite direction, of course.

In recent years, various studies validate the tourism led to exchange rate compete to exchange rate led tourism hypotheses. Cheng, Kim, and Thompson (2013) investigated the effects of the real exchange rate and income on US tourism export revenue and import spending with quarterly data for the floating exchange periods. Separate estimates of export revenue and import spending functions prove more revealing than estimates of the trade balance. They found that depreciation raises US tourism export revenue but does not affect import spending.

The study of Chang and McAleer (2012) argued that the exchange rate volatility can have positive or negative effects on tourist arrivals to Taiwan depending on the source of the international tourists. Naupane, Shrestha, and Upadhyaya (2012) showed that the long run risk or exchange rate volatility is persistence in monthly international tourist arrivals and estimated coefficients are statistically significant. The volatility can be inferred as risk or uncertainty associated with international tourist arrivals in Nepalese tourism industry. Therefore, this empirical study envisages sufficient room for intervening or amending the tourism policy to better attract international visitors and promote tourism as a business.

Nowjee *et al.* (2011) observed the relationship between annual tourism and real effective exchange rate in the context of the Mauritian economy using causality analysis. The simple pair wise Granger causality test revealed unidirectional causality running from tourism arrival to real effective exchange rate. In contrast, Tang (2011) concluded that both in the short- and long-run, real effective exchange rate Granger-causes monthly tourist arrivals, while tourist arrivals also Granger-cause real effective exchange rate.

Ghartey (2010) found that the real exchange rates do not cause tourist arrivals in the case of Jamaican annual data. The Johansen tests show tourist arrivals and real exchange rate to be co-integrated. He suggested that in both short-term and long-run to extend incentives to promote the country as a tourist destination is worthwhile. However, it is important that policy makers implement policies to reduce the leakage of foreign exchange earnings in the tourism sector.

In the case of Indonesia, empirical studies concerning tourism and exchange rate are limited. Song and Li (2008), for example, reviewed post-2000 empirical studies on international tourism demand and illustrated that the number of empirical studies about tourism demand for Indonesia was only two papers. One of them is Tan, Miller, and McCahon (2002) that modeled tourist flows to Indonesia and Malaysia. They concluded that the changes in exchange rates and relative prices seem to be a better indicator for the price variable for both destination countries.

Webber (2001) investigated the long-run demand for Australian outbound leisure tourism for nine major tourism destinations including Indonesia. The study used exchange rate volatility as an explanatory variable. The estimation and hypothesis-testing processes are undertaken using both the Johansen and Engle and Granger procedures.

The variance of the exchange rate was found to be a significant determinant of long-run tourism demand in 50 percent of estimates. Real disposable income and substitute prices were found to have inelastic long-run effects on tourism, while the long-run relative price elasticity tended to differ widely across countries. Surprisingly, Indonesia was the only country to find that the exchange rate has a significantly different impact on tourism than relative prices.

The brief literature review above suggests the potential for some interesting hypotheses about possible direct linkages between tourist arrival and exchange rate. This paper is an attempt to investigate whether inbound tourism contributes to exchange rate stabilization with focus on monthly Indonesian data. Since monthly international tourism arrival is cyclical associated with economic condition in the visitor country, we take into account its cyclicality instead of volatility.

*) The term "Dutch disease" was introduced to describe the situation experienced in the Netherlands in the 1960s after the discovery of gas deposits in the North Sea. The discovery of natural resources was followed by an appreciation of the real exchange rate and a crowding out of the manufacturing exports. More recently, the term is also used to describe the negative effects on exports induced by foreign aid, remittances, capital inflows, or an improvement in the terms of trade.

Cyclical fluctuations are short run waves between 1 and 12 years. It is commonly acknowledged that apart of long run trends, aggregate economic and financial time series are subjected to cyclical fluctuations which, in general, differ in terms of synchronicity, persistence, and duration (Eeckels, Filis and Leon 2006). As noted by Chang and McAleer (2012) a choice of appropriate data frequency or spatial aggregation will lead to robust findings as they are generally independent of the level of aggregation used.

4. Research method

The purpose of this section is to develop an analytical framework within which this can be clearly stated as a set of formal proposition. To identify stylized facts of business cycles and analyze the co-movements between the series of interest, each series must be de-trended first by removing the evolutionary (time-variant) trend within each series. De-trending makes it possible to separate fluctuations (cyclical components) around the trend of each time series, allowing examination of the statistical properties of the co-movements of deviations of tourist arrival and exchange rate from their respective trends (Lucas 1977; Kydland and Prescott 1990).
In the light of this definition, we work with cyclical components, t_c, of seasonally adjusted series $y_t \in \{TA, ER\}$ where *TA* represents tourist arrival and *ER* reveals nominal exchange rate (all in natural logarithms). We begin by de-trending each series y_t to separate its trend (growth) component, τ_t, from the cyclical components, c_t:

$$c_t = y_t - \tau_t \quad (1)$$

The de-trending approach we adopt is to estimate the (unknown) trend τ_t of each series by fitting Hodrick-Prescott (HP) filter. This method is widely used among macroeconomists to obtain a smooth estimate of the long-term trend component of a series. The method was first used in a working paper (circulated in the early 1980's and published in 1997) by Hodrick and Prescott to analyze postwar U.S. business cycles.
Technically, the HP filter is a two-sided linear filter that computes the smoothed series τ of y by minimizing the variance y of around τ, subject to a penalty that constrains the second difference of τ. That is, the HP filter chooses s to minimize:

$$\sum_{1}^{T}(y_t - \tau_t)^2 + \lambda \sum_{2}^{T-1}[(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \quad (2)$$

The penalty parameter λ controls the smoothness of the series τ. The larger the λ, the smoother the τ. As $\lambda = \infty$, τ approaches a linear trend. The default value of λ in Eviews is set to be 14,400 for monthly data.

The remaining cyclical component (c_t) must be stationary with zero mean. To check it, we conduct the standard unit roots tests. We use the stationary series representing cyclical components of tourist arrival and exchange rate series to identify cyclical characteristics by calculating contemporaneous and asynchronous cross correlations between them. A positive (negative) contemporaneous correlation is taken to imply that the tourist arrival is pro-cyclical (counter-cyclical) with the exchange rate series in question, vis-á-vis.

In general, a variable is said to be pro-cyclical (counter-cyclical) with – the movement of cyclical component of – the exchange rate, if the contemporaneous cross correlation (cross correlation at time $t = 0$) is positive (negative) in a statistically significant sense (Kydland and Prescott 1990; Pallage and Robe 2001; Alper 2002).

Pro-cyclicality (counter-cyclicality) of tourist arrival in this context refers to the tendency of tourist arrival to move above its trend, whenever the corresponding exchange rate variable is above (below) its respective trend. In the absence of such a tendency, tourist arrival and exchange rate are said to be a-cyclical.

While calculating asynchronous correlations between the cyclical components of the relevant variable and tourist arrival, the latter was shifted by one to twelve months in both directions. The resulting cross correlation coefficients enable one to identify possible phase shifts by looking at how early or how late the highest correlation appears relative to the contemporaneous period (Pallage and Robe 2001). If the largest (in absolute value) significant correlation between a particular series and the exchange rate occurs when the series is shifted backwards (forwards), then the variable is said to be leading (lagging) the cycle. If, for example, the largest significant correlation coefficient between exchange rate and a pro-cyclical series is obtained when that series is shifted back (forwards) by m months, then the series is understood to have a tendency to peak about m months before (after) the exchange rate peaks. In such a case, the series is said to lead (lag or follow) the – exchange rate – cycle.

To evaluate the statistical significance of the correlation coefficients calculated, the null hypothesis that the unknown population correlation, ρ, is equal to zero was tested against the two-sided alternative that $\rho \neq 0$, using the correlation coefficients, r, calculated from the relevant samples. In deciding whether to reject or not reject the null hypothesis, the critical t-values were determined according to

$$t = r\sqrt{\frac{n-2}{1-r^2}} \tag{3}$$

where n is the number of observations in each sample. This means that correlation coefficients falling outside the $[-2 / \sqrt{(n+2)}, +2 / \sqrt{(n+2)}]$ range will require that the null hypothesis be rejected, i.e. will be considered significant statistically.

Establishing correlation between cyclical components of series gives a partial idea about cyclical proprieties. First, correlation is simple bi-variate statistics which eliminates possibilities to control for other added variables. Second, correlation does not give information about causality among the variables. Since we are interested in examining the dynamic interactions between tourist arrival and exchange rate, we rely on Granger causality and vector autoregressive (VAR) models for our empirical analysis.

VAR model has certain advantages in that in a VAR model, dependent variables are expressed as functions of their own and each other's lagged values and all the variables are allowed to affect each other (Enders, 2004). We use a general unrestricted p^{th}-order VAR model as follows:

$$y_t = \alpha a + \alpha a_p \Sigma\, y_{t-p} + \beta a_p \Sigma\, x_{t-p} + \varepsilon a_t \tag{4a}$$

$$x_t = \alpha b + \alpha b_p \Sigma\, x_{t-p} + \beta b_p \Sigma\, y_{t-p} + \varepsilon b_t \tag{4b}$$

Based on (4), we display that it is possible for tourist arrival to and exchange rate cycle, in the same time; it is feasible that the corresponding variable responds to changes in exchange rate cycle.

To measure the response of each variable after a shock to another variable in the system we estimate the variance decomposition and impulse response functions. This proceeding constitutes an alternative method to analyze co-movement between variables of interest. In other words, if the response of tourist arrival after a shock to exchange rate is positive we deduce that tourist arrival is pro-cyclical with exchange rate.

First we assume that innovations to the cyclical components of tourist arrival are contemporaneously uncorrelated with innovation of other variable. This means that shocks to the exchange rate is exogenous. Second, we relate tourist arrival to exchange rate. Thirdly, we have tourist arrival is a function of exchange rate. This argument is consistent with the demand theory and evidence that tourist arrival responds to the changes in exchange rate. Finally, the exchange rate determines tourist arrival.

5. Result and discussion

We employ the following indicators: tourism arrivals and exchange rate. Tourism arrivals are the number of international visitor/people entered into Indonesia excluding transit passengers. We used nominal effective exchange rate that is an index that describes the relative strength of a currency relative to a basket of other currencies, instead of nominal exchange rate, that is the price of foreign currency against domestic currency (Rupiah).

The reason is plausible that the use of single exchange rate (let say US Dollar) implicitly assumes that the international inbound tourism only comes from a specific country or some countries that use US dollar as the official currency. In fact, the origin of tourism arrivals entered to Indonesia varies in their own currency. Hence, the effective exchange rate can capture those diversities. Moreover, in a multilateral, highly globalized, world, the effective exchange rate index is much more useful than a bilateral exchange rate for assessing changes in the competitiveness due to exchange rate movements.

The sample periods chosen for this study extend from 2004(1) to 2013(9) because of data availability in particular tourism data. The total observation is 117 sample points. The data of tourism arrivals are electronically taken from publications of Central Board of Statistics (www.bps.go.id) and Ministry of Tourism and Creative Economy (www.budpar.go.id). The effective exchange rate data (2010 = 100) come from Bank of International Settlement (www.bis.org).

Figure 1 delivers the dynamics of the two variables of interest. Brief visual inspection onto Figure 1 seems that tourism arrivals are more stable than the other. After the deep decrease in the mid-2005, the tourism arrivals grew positively in the preceding years with exception in mid-2008. On the other hand, effective exchange rate fluctuated especially depreciated in early 2005 and again sharply decreased in the end of 2008 in line with the global financial crisis. After that, the tourism arrivals grew steadily meanwhile the exchange rate rather fluctuated.

It is noticeable that overall there were synchronous fluctuation patterns particularly between tourism arrivals and effective exchange rate. The pair wise correlation between log TA and log EER is -0.55 during period of 2004-8, -0.01 in 2009-13 period, and -0.68 in the whole period respectively. We can say that the dynamics of tourism arrivals is strongly associated with the fluctuation of effective exchange rate in the pre-global financial crisis but the relationship is probably unstable especially in the post-global financial crisis.

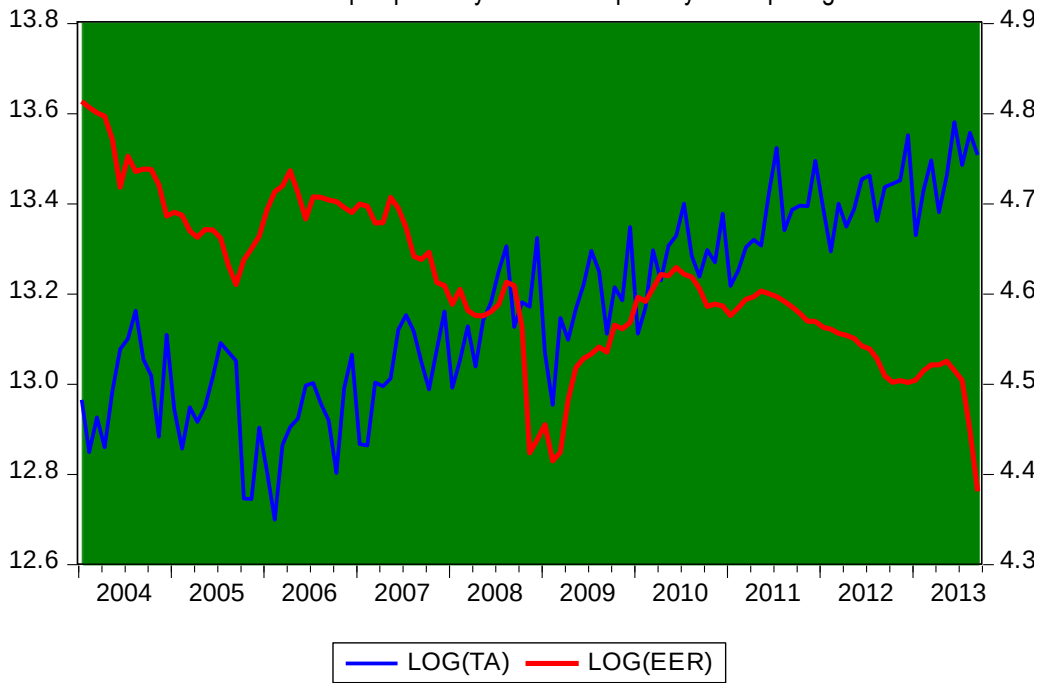

Figure 1 -The Fluctuations of Tourist Arrival and Exchange Rate

In order to evaluate more deeply the stability of tourism arrivals and exchange rate, coefficients of variation (CV, standard deviation to mean ratio) are calculated for each indicator. Table 2 presents the elementary descriptive statistics. In the whole period of observation, CV for tourism arrivals (1.60%) and effective exchange rate were almost the same (1.93%).

When we divide the sample period into pre- and post-global financial crisis, the conclusion does not change. In the pre- and post-period of global financial crisis (starting from 2009(1) and so forth), the CV value for tourism arrivals remained being lower (1.03 compared to 1.00%) and that for effective exchange rate was 1.60 compared to 1.20%. Regardless the cyclicality, the statistical evaluation above confirms that both tourism arrivals and effective exchange rate have a low volatility.

Table 2 - Descriptive statistics

	LOG(TA)	LOG(EER)
Mean	13.1640	4.6098
Median	13.1591	4.6023
Maximum	13.5793	4.8127
Minimum	12.6971	4.3799
Std. Dev.	0.2105	0.0891
CV (%)	1.5993	1.9334
Observations	117	117

In the proceeding section we focus on the cyclical components of each series. Cyclical components of tourism arrivals (CTA) and effective exchange rate (CEER) are given in Figure 2. The cyclical component of tourism arrivals is far enough from its trend ranging from -0.25 to +0.2 but consistently drops in the first two months each year. In contrast, the cyclical component of effective exchange rate is not far to its trend (from -0.15 to +0.5).

It seems that the CTA and CEER tend to move in the opposite direction. When Rupiah depreciates (or equivalently foreign currencies appreciates), the prices of goods/services in Indonesia become cheaper relative to those in other countries. Consequently, the relative strength of the Rupiah relative to a basket of other currencies then decreases. It encourages higher tourism arrivals to travel into Indonesia. This also confirms to the assumption of measurement that tourism arrivals are closely related to tourism expenditures. Overall, we can expect that there is a negative relationship between two variables of interest as the original data that was found from Figure 1.

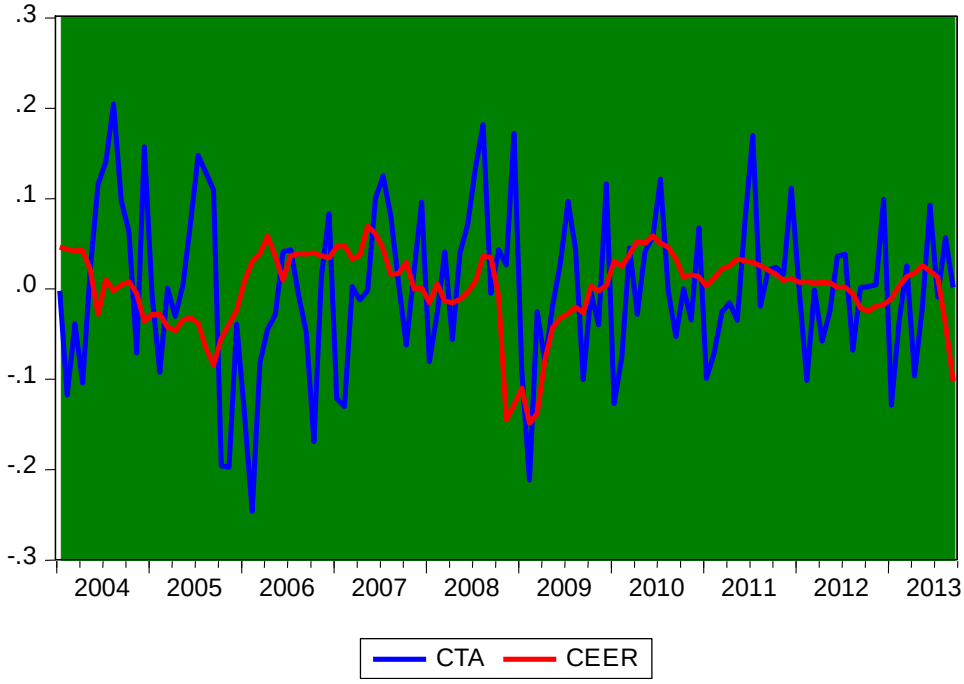

Figure 2 - The Cyclical Components of TA and EER

To ensure whether all of the cyclical components are stationary, each series will be examined 6 times using both ADF (Augmented Dickey-Fuller) and PP (Phillip-Perron) unit roots test procedures with respect to intercept, intercept and time trend, and none. The ADF and PP unit roots are based on the null hypothesis that the respective time series are difference stationary. We assume that the underlying data are not stationary. The results concerning the stationary of the cyclical components obtained after HP de-trending process are reported in Table 3.

The null hypotheses of non-stationary can be rejected, which does not demonstrate the existence of a common trend in those series. All of the cyclical components (especially tests for imposing no constant and time trend) in all cases were found to be stationary in 5% significance level implying the series data have a unit roots. It also implies that the behavior of the variables varies around to the mean value and invariant overtime (Enders 2004). The occurrence of unit roots in the series gives a preliminary indication of shocks having permanent or long lasting effect, thus making it very difficult for traditional stabilization policies to survive.

Table 3 - Unit Root Tests of Cyclical Components

Test	To Be Included in the Test Equation	CTA		CEER	
		t-stat	Prob.	t-stat	Prob.
ADF	Intercept	-2.5462	0.1077	-3.1598	0.0250
	Intercept + trend	-2.5571	0.3008	-3.1261	0.1053
	None	-2.5441	0.0113	-3.1819	0.0017
PP	Intercept	-7.7582	0.0000	-2.8687	0.0522
	Intercept + trend	-7.7234	0.0000	-2.8516	0.1823
	None	-7.7929	0.0000	-2.8916	0.0041

Stationary properties of the time series data is required to perform co-integration. Co-integration is an important concept to analyze the long-run behavior of the data. Using Johansen's maximum likelihood approach, we test the bi-variate between the two variables with 4 lag in all the cases. The trace statistics together with maximum eigenvalue (λ *max*) for testing the rank of co-integration are shown in Table 4.

The results of both tests deny the null hypotheses of absence of co-integrating relation of the two volatile series. Furthermore, both tests suggest the presence of two co-integrating equations at 5% level or even 1% significance level between the non stationary (or stationary at the different levels) series which means that the linear combinations of them are stationary and, consequently, those series tend to move towards the equilibrium relationship in the long-run.

Table 4 - Co-integration Tests of Cyclical Components

Hypothesized		**Trace**	**5 %**	**1 %**
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.209378	35.27987	15.41	20.04
At most 1 **	0.076942	8.96709	3.76	6.65
*(**) denotes rejection of the hypothesis at the 5%(1%) level				
Trace test indicates 2 cointegrating equation(s) at both 5% and 1% levels				

Cross-correlations between the two cyclical components are presented in Table 5 indicating a negative relationship for each 12 month lags. Some of them are statistically significant particularly in the first 3-9 months. The negative lag cross-correlations between the cyclical components of tourism arrivals and exchange rate imply that tourism arrivals are counter-cyclical associated with exchange rate.

Unfortunately, in the period of December to February, none lag cross correlations are found to be statistically significant meaning that tourist arrival flows to Indonesia are a-cyclical associated with effective exchange rate. In other words, tourists in those months do not tend to pay attention to the exchange rate developments in the destination country for reasons other than achievement the goals of their travel.

In contrast, lead cross-correlations indicate a positive relationship. Only a few of them (the first 2-3 months) are statistically significant. The positive lead cross-correlations between the cyclical components of tourism arrivals and effective exchange rate imply that exchange rate is pro-cyclical with regard tourism arrivals implying that tourism arrivals induce effective exchange rate appreciation. At this point, we can say that tourism arrivals can contribute to stabilize exchange rate at least in 2-3 months.

We also highlight the highest such correlation. In the case of counter/pro-cyclicality, we identify possible shifts (lags or leads) by how early or how late with the respect to the contemporaneous this highest correlation appears. Regarding the lag cross-correlation between cyclical components of tourism arrivals and effective exchange rate, the highest value is in lag 4. It means that effective exchange rate depreciation will lead tourism arrivals by 4 months.

Accordingly, we conclude that tourism arrival inflows could be as a hedge against exchange rate shocks regarding the counter-cyclical behavior of these flows. Consequently, tourism arrival flows and effective exchange rate appear to move in the opposite direction and it serves as an engine for the economic recovery especially in the post-global financial crisis periods (UNWTO 2013). This result is consistent with Geyikdagi and Geyikdagi (1997).

The tourism arrivals flow tends to lead effective exchange rate appreciation by 2 months. We conclude that tourism arrivals may act as produce stabilizing force since this would increase the capacity of external

financing flows to absorb additional fluctuations in current account balances, with serious macroeconomic effects as Sayan (2006) and Kumar, Naidu, and Kumar (2011) found in the case of worker remittances.

Table 5 - Pair Wise Cross Correlation of Cyclical Components

Period	CEER- CTA		Period	CEER- CTA	
	Lag	Lead		Lag	Lead
0	-0.0025	-0.0025	7	-0.2049*	0.0602
1	-0.0401	0.0921	8	-0.2043*	0.0437
2	-0.1242	0.2310*	9	-0.2254*	0.0679
3	-0.2762*	0.2041*	10	-0.1145	0.1646
4	-0.2827*	0.1435	11	-0.1646	0.1585
5	-0.2649*	0.1241	12	-0.1640	0.1083
6	-0.2738*	0.0607	(*) denotes significant in 5 percent level		

Those findings are still incomplete because, as stated in the previous section, correlations do not provide information about causality links between variables of interest. As presented in Table 6, we conduct standard Granger causality test with 2 and 3 lags respectively. The 2-lags test is suggested by the highest and earliest result of pair wise lead cross correlation of cyclical components significance (see again Table 5). The 3-lags test is chosen based on LR, FPE, AIC, SC, and HQ criteria.

The results of Granger causality tests show that there exists a long run unidirectional causality from tourism arrivals to exchange rate. The said is not false for the reverse. These results suggest that tourism arrivals factor is growing in significance in the exchange rate complex. This is a plausible result since modern international tourism depends heavily on the use of capital intensive technology in every stage of production and marketing. (Werthner and Klein 1999, Cornelissen 2005)

The universal adoption of production and marketing technology is imported from developed countries; that is, production and marketing of tourism is heavily dependent on available foreign currency. The increases in foreign currency demand will have depreciated exchange rate. As stated before, the depreciation of domestic currency has raised the international tourism arrivals. The international tourism arrivals then increase the quantity of foreign currency supplied. Eventually, the exchange rate appreciates.

Table 6 - Granger Causality Test between TA and EER Cyclical Components

Null Hypothesis:	Obs	F-Statistic	Probability
2 Lags: CEER does not Granger Cause CTA	114	3.43348	0.01962
CTA does not Granger Cause CEER		4.29082	0.00669
3 Lags: CEER does not Granger Cause CTA	113	2.76721	0.03121
CTA does not Granger Cause CEER		2.48453	0.04810

Furthermore, using VAR methodology gives us possibility to control more additional factors. Table 7 reports the fraction of the forecast error variance in the cyclical component of exchange rate generated by innovations in the cyclical components of tourism arrivals for 10 periods. It seems that cyclical component of exchange rate presents the principal driving factor explaining itself on the average up to 93.83% of the variance. Tourism arrivals account for about 6.17% of the variance on the average.

The right side of the table presents the portion of the forecast error variance in the cyclical component of tourism arrivals. The cyclical component of tourism arrivals generated by innovations in the cyclical components of exchange rate on the average presents up to 5% of the variance. We establish that cyclical component of exchange rate is relatively less affected by tourism arrivals. Given that, we affirm that exchange rate is relatively less independent to the tourism arrival flows to Indonesia as found from cross correlation analysis above.

However, comparing the values in the third and fourth column provides similarities both in terms of its magnitude and pattern. Given that, we say that tourism arrivals effects on exchange rate and also exchange rate effects on tourism arrivals. In other words, a bi-directional causality runs from tourism arrivals to exchange rate supporting to the result of Granger tests above. We can confirm that tourism arrivals could be as stabilizing factors against exchange rate shocks and fluctuations.

Figure 3 graphically reports impulse response functions of cyclical component of exchange rate. We find a large dissimilarity between the two cyclical components. It seems that a shock to the cyclical component of tourism arrivals has an initial positive effect on exchange rate during two months. In the next two months, the response of exchange rate remains negative corresponding to the reduction in the tourism arrivals shocks. It is notable that after the forth month the cyclical components of tourism arrivals and exchange rate tend to converge to each other. Given that, there is a positive pattern of exchange rate reaction to tourism arrivals shock and then becomes pro-cyclical.

Observing impulse response functions of cyclical component of tourism arrivals (lower part of Figure 3), we find that shocks on exchange rate have a negative impact on tourism arrivals especially in the first-three months as found in the cross correlation analysis. In the consecutive periods, the pattern of tourism arrivals reaction to exchange rate shock is very close to the zero line, meanwhile the exchange rate shocks tend to decrease. It is notable that cyclical components of tourism arrivals and exchange rate seem to be counter-cyclical or even a-cyclical. This result confirms to the previous finding that tourist arrival flows to Indonesia are relatively less sensitive associated with effective exchange rate.

Table 7 - Error Variance Decomposition of Cyclical Components (in %)

Period	Variance Decomposition of CEER:		Variance Decomposition of CTA:	
	CEER	CTA	CEER	CTA
1	100.00000	0.000000	1.179890	98.82011
2	97.38814	2.611861	0.870747	99.12925
3	97.33499	2.665005	2.521818	97.47818
4	95.55899	4.441009	4.456593	95.54341
5	93.64234	6.357661	5.709176	94.29082
6	92.20063	7.799366	6.472489	93.52751
7	91.20321	8.796786	6.933006	93.06699
8	90.59471	9.405289	7.188641	92.81136
9	90.26887	9.731127	7.316408	92.68359
10	90.11209	9.887905	7.373837	92.62616
Mean	93.83039	6.169601	5.002261	94.99774
	Cholesky Ordering: CEER CTA			

So far, we have talked about cyclicality of tourism arrivals and exchange rate without explicitly incorporating other macroeconomic variables such as interest rate, inflation, GDP, FDI, ODA, worker remittances, and international reserve. In order to take into account the selected macroeconomic fluctuations simultaneously, we will explore the direct reaction function between exchange rate and GDP.

Suppose, exchange rate increases (or depreciates) to a one standard deviation. The increase in the exchange rates induces the inflation rate as well as interest rate. The latest reduces FDI. The decrease in FDI, fortunately, can be compensated by rising ODA and worker remittances. Consequently, international reserve and GDP growth rate are not affected largely or perhaps increase. For the period corresponding to the GDP shock, the tourism arrivals relatively remain constant due to a-cyclical movement to the destination income. The net effect on the tourism arrivals path implied by the shock to all of macroeconomic variables, given the initial conditions, is a steady increase in tourism arrivals for up to 12 months after the initial shock.

The innovation from an increase in the GDP shocks results in a transitory appreciation in the exchange rate and transitory reduction in the interest rate. While the initial responses are difficult to reconcile intuitively, the simulations show that the subsequent increase in the interest rate and other economic deterioration result in a persistent decrease in international reserve in the case the deterioration in FDI growth rate cannot be substituted by rising ODA nor worker remittances flows. Overall, the net effect on the exchange rate path implied by the shock to all of macroeconomic variables, given the initial conditions, is a steady stability in the exchange rate for at least 14 months after the initial shock, slightly longer than the net effect in the opposite direction.

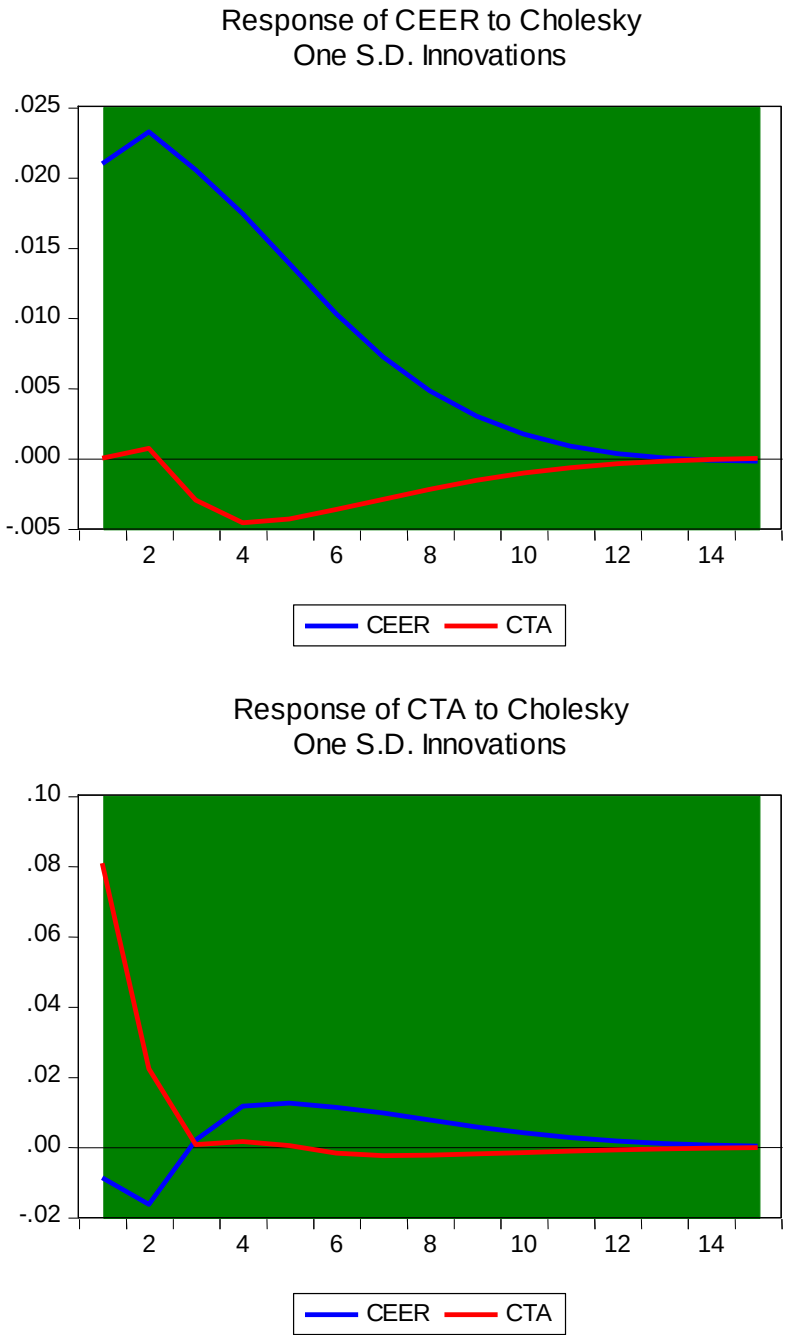

Figure 3 - Impulse Response of Cyclical Components

Concluding remarks

The objective of this paper is three folds. First, we search to assess tourism in relation to exchange rate in Indonesia. Second, we search to find the business cycle proprieties of tourism arrivals to Indonesia. Third, we established a comparison between the cyclical proprieties of tourism arrivals and cyclical proprieties of effective exchange rate for that country using monthly data for the period of 2004-13. The eminent purpose of this work is to find a quantitative framework which is able us to provide stylized fact of tourism arrivals.

To illustrate business cycle features of tourism arrivals, we utilize a simple cross correlation between cyclical components series of interest. We conclude that tourism arrivals into Indonesia are counter-cyclical with respect to exchange rate. Given that, we conclude that decisions to travel into Indonesia are dominated by economic motives. Any appreciation in tourist currency (or depreciation in the destination country) may encourage more people to travel.

Regarding variance decomposition of forecast error, we demonstrate that fluctuation of tourism arrivals explicate a significant part of the forecast error variance in the cyclical components of exchange rate. We also find that forecast error variance in the cyclical components of exchange rate are positively contributed significantly by cyclical components of tourism arrivals. We can say that the two co-integrated variables have bi-directional causality.

In conclusion, we can say that these results indicate that tourism arrivals have a big potency to absorb other external funding sources volatility (i.e. ODA and FDI) in order to maintain sufficient international reserve as well as stable exchange rate. In such a case, improving the competitiveness of tourism sector should be an integral part of the exchange rate stabilization program. Future research direction should be to construct models that grasp the reality and flexible enough to include all relevant variables to empirically test the tourism-led to-exchange rate hypotheses.

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