Decoupling between emerging and advanced economies

An exploratory analysis

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1. Introduction

Financial crises, as pointed out by authors such as Kindleberger (1978) and Eichengreen and Bordo (2002), are persistent features of capitalist societies. As far back as the 1600s, a stock market crash in Amsterdam led to severe depression in Europe. Other such crises repeatedly emerged, the most serious of which was the Great Depression which lasted throughout the 1930s. The most recent global financial crises started in 2008 when the American subprime housing bubble burst.

Therefore, financial crises such as the credit crunch of 2008 are nothing new (Reinhart & Rogoff, 2008). What does distinguish more recent financial crises from previous ones is the rapid propagation of such crises to other economies. Interestingly, though the 2008 crisis quickly spread to other advanced economies, it appeared that emerging and developing countries were largely shielded from the turbulence in global financial markets. Blanchard, Faruqee, Das, Forbes and Tesar (2010) state that, while growth in advanced economies averaged minus 7.2 and minus 8.3 per cent in the fourth quarter of 2008 and first quarter of 2009 respectively, growth in emerging markets was not as strongly influenced, averaging minus 1.9 per cent and minus 3.2 per cent during the corresponding time.

This led to speculation on the possibility that emerging economies had decoupled[1] from economies in the West, as emerging markets continued to expand output while GDP in Western economies declined. The IMF's World Economic Outlook for 2007 even devoted an entire chapter to the idea of decoupling, stating that:

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[1] It is necessary to briefly define what is meant by decoupling, and point out two important distinctions. Decoupling refers to the idea that emerging markets are no longer dependent on advanced economies to fuel their economic growth. Decoupling can be said to be either financial or real (fundamental). Financial decoupling refers to the level of independence achieved by emerging markets in their financial markets. Real decoupling, on the other hand, refers to a greater degree of emerging market insensitivity to advanced economies' business cycle fluctuations, and implies that emerging markets will experience less fluctuation in output when these economies experience a recession.

So far, […] the U.S. slowdown has had little discernible effect on growth in most other countries.

However, the existence and extent of decoupling between emerging and advanced economies mostly remains an empirical issue. Though many studies were published on the issue of co-movement during the time of the crisis, few of them have data series which include observations for the crisis and subsequent years. The 2008 credit crunch provides an opportunity to exploit further dynamics and gain insight into the decoupling issue, and is therefore the focus of this paper. The rest of the paper is structured as follows: Section 2 provides an overview of the empirical research already done on the topic; Section 3 outlines the data and method used in the study; Section 4 presents a discussion of the results, and Section 5 concludes.

2. Literature review: The current state of research

In order to provide a background on the decoupling issue, this literature review focuses on empirical research conducted on the issue of decoupling between emerging and advanced economies. Note that the issue of decoupling is in essence a business cycle issue. Studies conducted on the issue of decoupling are therefore studies which analyse business cycle co-movement, in order to gain a deeper understanding of the interdependence between economies. Though an exhaustive review of business cycle theory falls outside the scope of this paper, it is important to bear in mind that business cycle co-movement between economies is generally caused by transmission mechanisms such as trade and financial linkages (Glick & Rose, 1999; Dornbusch, Park & Claessens, 2000; De Gregorio & Valdes, 2001).

The time period under consideration is 2000 to 2012, in order to provide a picture of the research done in the years leading up to, during and following the 2008 financial crisis.

In the years prior to and during the credit crunch, the speculation on the decoupling hypothesis ensured an abundance of research on the topic.

Two seminal studies on the decoupling hypothesis were published during this time by Kose, Otrok and Prasad (2012) and Akin and Kose (2008). Akin and Kose studied a sample of 106 countries which were divided into three country groupings: advanced

economies (the North), emerging markets (the Emerging South), and developing countries (the Developing South). Their study focuses on the period between 1960 and 2005, and employs panel data analyses to conclude that, while emerging markets are decoupling from developed markets, developing countries show a pattern of recoupling with developed countries.

Kose, Otrok and Prasad (2012) also investigated the change in business cycle dependency that had occurred in a sample of 106 countries during the period 1960 to 2005. The authors divide their sample into three different country groupings: developing economies, emerging markets and industrial countries. Analysing fluctuations in investment, output and consumption using dynamic factor analysis, the authors find that business cycles within individual emerging market economies are converging with each other, just as business cycles within individual industrial economies are recoupling with each other. Emerging markets and industrial countries, however, are decoupling from each other.

Llaudes, Salman and Chivakul (2010) analysed the change in quarterly GDP growth for various emerging and advanced economies during 2008 and 2009, in order to paint a picture of the output fluctuations that occurred in those countries during the crisis. The picture that emerges is not a clear-cut answer on decoupling, but rather one that shows that business cycles are dynamic. According to the authors, most emerging financial markets initially showed signs of decoupling from advanced economies as the crisis struck, only to recouple as the crisis deepened, and then later on re-decouple once again. Miankhel, Kalirajan and Thangavelu's (2010) analysis of business cycle movements in various regions during and immediately subsequent to the onset of the 2008 crisis provides some insight into this phenomenon of de- and then recoupling. The authors employ a panel vector autoregressive framework to investigate how the crisis, which originated in America, influenced business cycle movements in the EU, NAFTA, MERCOSUR, ASEAN+3 and SAARC. The results show that the extent of decoupling depends on the exact nature of the transmission mechanisms that are at play during various stages. For instance, when US housing prices came tumbling down early on in the crisis, most of that shock was transmitted through trade. Many countries have

become less dependent on US trade in the past decade, and therefore were insulated against the first wave of the crisis. This appeared as decoupling. Subsequent to the initial shock in house prices, though, financial variables were shocked when Lehman brothers fell in 2008. As most regions analysed were much more financially connected, this shock transmitted into GDP, and the regions saw downturns in their GDP, indicating that recoupling had occurred.

Yeyati and Williams (2012) study the co-movement of both real and financial variables of G7 countries with the global economy between 1993 and 2010. This is done by regressing the quarterly GDP growth rates of various countries onto each other. The authors find little evidence that real decoupling has occurred between emerging and advanced economies. Instead of real decoupling, the authors suggest, emerging markets have managed merely to reduce the level of their dependency upon G7 economies and have diversified away to become more integrated with emerging Asia. This move can be ascribed to the emergence of China, who has become an ever increasing driver behind global output fluctuations. Strong commodity prices and trade diversification have also contributed to the gradual decoupling that emerging markets are experiencing. Dong and Wei's (2010) study of Asian business cycle synchronization corroborates the idea that emerging Asia is decoupling from the rest of the world, while Moneta and Rufer's (2003) study shows that Asian economies are becoming more synchronized with each other. The importance of Asia is also emphasized by Iley and Lewis (2011), who query whether the 2008 crisis has led to a New World Order in the global economy. The authors conclude that the crisis was the catalyst which propelled the emergence of Asia, in particular, giving rise to a decoupling between emerging markets and the advanced economies of the North.

Remaining with the focus on Asia, Fidrmuc and Korhonen (2010) specifically investigate the decoupling hypothesis for China and India. Quarterly GDP data is used to determine dynamic correlations between these economies, and OECD economies. The authors conclude that the decoupling hypothesis generally holds for these economies, though after the 2008 crisis, Asian business cycles have become more synchronized with OECD cycles, indicating recoupling instead of decoupling. India's recoupling with

advanced economies is supported by the research conducted by Jayaram, Patnaik and Shah (2009).

Pula and Peltonen (2009), however, caution that the analysis of business cycle co-movement in Asia has become much more difficult, due to the existence of global production networks. Therefore, it might seem that emerging Asia has decoupled from the West, and the US specifically, because the region's direct trade links to the West have been reduced. This, however, does not reflect the true extent of Asia's dependence on external demand. Many assembling businesses in Asia do rely on Western business cycles, since it is for those markets that they are manufacturing. Using an input-output table to control for this, the authors investigate the level of decoupling found in emerging Asia and conclude that there has been no decoupling. Instead, emerging Asia has strong trade linkages with the rest of the world and is therefore vulnerable to shocks originating in other economies.

Other studies support the notion that global economies are more interdependent, as well. A study done by HSBC in 2010, for instance, finds that GDP growth has become more correlated globally across countries, indicating that there has been no real decoupling between emerging markets and advanced economies. Elasticity estimates reveal that most countries would experience a drop of 0.5 to 1.5 percentage points in their GDP, if either the European or American economy were to contract by one per cent.

Similarly, Walti (2010) estimates business cycle interdependence using the Euclidean distance, which provides a graphical representation of cycle co-movement. The author concludes that there is no evidence for decoupling in his sample, which covers more than thirty countries between 1980 and 2008, and focuses on the value of annual GDP during those years. In fact, the author argues, business cycles have become even more interdependent in recent years.

Yetman (2011) also argues that global economies generally recouple during recessions. The author's analysis of various countries during 1971 to 2007 shows that real GDP across countries generally behaves more or less randomly. Recessions are the only

times at which clear patterns emerge, generally showing that real GDP growth across countries become more synchronized. During financial crises such as that of 2008, therefore, recoupling commonly occurs and it can be expected that emerging markets will follow the lead of industrial economies. Yetman (2011) also points out that the frequency at which data is analysed bears significance for the results found on co-movement. The author focused specifically on high frequency data, while most empirical studies use mostly low frequency data.

The decoupling phenomenon might also be even more nuanced, with individual countries or groups of countries becoming more synchronized with each other, while seemingly decoupling from other countries and or regions. Cesa-Bianchi, Pesharan, Rebucci and Xu's (2011) analysis of co-movement between various Latin American countries, China and the US shows that, while Latin American countries have decoupled from the American business cycle, they have recoupled with the Chinese one. Similarly, Artis, Chouliarakis and Harichandra (2011) find that, historically, the tendency has been for some regions to become more synchronized, while other regions decouple.

The studies discussed here indicate that co-movement between emerging markets and advanced economies is complex. The empirical research conducted on the issue during the past decade is characterized by wide differences in methodology and data. Some find clear-cut evidence to suggest that emerging markets are decoupling, while others find that business cycles across countries have become more synchronized. Factors such as global production networks and regionality also come into play, contributing to the variation in results. Specifically, emerging Asia seems to be a region that is starting to decouple from advanced economies, driven by China and India especially.

It might also be that decoupling and recoupling is something which occurs almost naturally over the course of a business cycle, with the tendency being for emerging markets to generally be independent of, or decouple from, the business cycles of advanced economies. During times of recession, however, it can generally be expected that emerging markets will comove more strongly with advanced economies.

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The following section provides information on the data and empirical method used.

3. Data and research method

Dynamic factor analysis is used to extract the common components which drive business cycle fluctuations in emerging and advanced economies. Quarterly data on real and nominal variables such as real GDP, CPI, short term interest rates, exchange rate and the oil price are gathered mostly from the GVAR database. Quarterly data on trade is gathered from the IMF's International Financial Statistics[2]. Using the HP filter, the business cycles for the available countries are also extracted from the real GDP in order to analyse the level of business cycle co-movement which took place between emerging and advanced economies. Given the importance of the United States in the global economy, additional variables for the United States, including industrial production, unemployment rate, real effective exchange rate, PPI and the value of the S&P 500 are included. These quarterly variables were obtained from the IMF's International Financial Statistics, as well as the OECD. Data on the S&P500 was gathered from the S&P500.

The period covered ranges from the first quarter of 1979 to the second quarter of 2011. The period is selected based on data availability, but also to take into account the co-movement of variables both prior to and after the brunt of the 2008 financial crisis.

The original GVAR data set includes data for 33 countries[3], which include 16 emerging markets and 17 advanced economies. However, due to the dearth of data for Saudi Arabia, this economy is left out of the sample. The resultant sample has a size of 225 observations (N) over 128 time series (T).

All data was checked for seasonality using the X12 method, and seasonally adjusted where necessary. The stationarity of the time series was established using the KPSS and DF GLS methods of testing for unit roots. Where unit roots existed, data was

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[2] Note that, while data for nominal imports and exports are complete for all countries, real trade data is limited. To obtain real imports and exports, the log of CPI for each country is subtracted from the log of nominal imports/exports for each country.

[3] The countries are: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Finland, France, Germany, India, Indonesia, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States.

differenced accordingly. Note that, due to differencing, observations for 1979Q1 and 1979Q2 are lost. The logarithms of all series were also taken, except in cases where there were negative values, or where the variable represented a rate.

After data has been transformed to take care of issues such as stationarity and seasonality, dynamic factor analysis is performed in Matlab.

The factor analysis helps to determine which groups of common factors are driving certain phenomena. To identify these common factors, the following steps are followed.

First, the log-differenced data is read into Matlab and standardized.

After standardization, the Bai-Ng criteria are estimated in order to determine the number of factors which are to be specified.

When the number of factors have been identified and specified, the variance share of common components is estimated and analysed in order to identify which variables can be seen as common variables (variables which determine co-movement for the entire sample) and which can be seen as idiosyncratic (movements caused by some unique attribute of a certain country).

In order to gain a more dynamic idea of levels of co-movement between the economies in this sample, various iterations of the model are run. Firstly, the model is run for the general period of available data, 1979Q3 to 2011Q2. This is to analyse what happened to the overall level of co-movement during the entire period under investigation.

Secondly, the data is split up into various sub-periods and the same model is estimated again. The sub-periods are: 1979Q3-1990Q4, 1991Q1-2000Q4 and 2001Q1-2011Q2. These periods are chosen based on the idea that emerging markets generally only started to become more globalized during the 1990s. Keeping these separate decades then allows us to analyse what happened to co-movement between emerging market and advanced economies prior to and during these periods of intensified globalization. It also enables estimation of the levels of co-movement that occurred prior to and immediately after the 2008 global financial crisis, which falls within the last sub-period.

The following section discusses the results obtained.

4. Results

This section presents the results obtained from the estimation of the dynamic factor analysis, as described above.

Overall sample: 1979Q3-2011Q2

The available data for the sample of 32 emerging and advanced economies is used to extract the common components during the entire period under investigation. After standardization of the data, the Bai-Ng criteria show that three factors should be specified for this period.

Three factors are specified and the overall variance share of the common components which are extracted are analysed to gain an impression of the extent to which these common components explain the variance in the data. The variance share of the common components is a measure similar to an R-squared in normal regression analysis, and gives an indication of the amount of variance in the data which is explained by a set of common components.

In order to determine those variables for which the majority of variance can be ascribed to a common component, variables with a variance share of 80 per cent and larger are identified.

Generally, the variance share explained by common components is low, indicating that the variance in the observed variables was not driven by common components. In other words, the economies included in this sample generally were decoupling from each other during this specific period. Those instances where the variance share of common components explained 80 per cent or more of the variance could be ascribed to advanced economies, indicating that advanced economies during this period tended to share common components. Emerging markets as a whole were therefore decoupling from advanced economies. For the most part, the highest variance shares were detected for imports, exports and the local currency vs. US dollar exchange rate, showing that trade is an important transmission channel for advanced economies.

In order to ascertain exactly which factors drive the co-movement, however, factor identification needs to be done. In order to identify exactly which variables are represented by the three factors which were estimated according to the Bai-Ng criteria, the following steps are followed:

The variance share for each specific factor is estimated and analysed. This gives an indication of the extent to which each individual factor explains the variance in the sample. Once the variance share of each individual factor is obtained, the variance shares are ranked in order from largest to smallest. Sorting the variance shares in this manner enables us to identify which group of variables is most explained by a given factor, thereby revealing what each factor is.

Following this procedure, the three factors that mostly drove the small amount of co-movement that existed between advanced economies during this period were trade (imports and exports), business cycles and local currency vs. US dollar exchange rate.

Specifically, United States imports, the United States business cycle and France's exchange rate against the dollar were identified as the three factors which drove co-movement during the period under investigation. This points to the fact that the United States has remained the most influential economy for the overall sample being investigated.

Trade is known to be an important transmission channel for international spillovers. The fact that US imports are such an important factor shows that the US is an important trading partner for the rest of the world. When the US imports less, for whatever reasons, this has a negative influence on its trading partners, whose revenues drop as export earnings decrease. This effect could negatively impact on production.

Similarly, the phase of the US business cycle was an important factor in explaining co-movement. During recessions, US demand drops and imports decline, leading to the cycle previously explained.

The importance of local exchange rates *vis à vis* the US dollar also point to the importance that trade plays as a transmission channel. Interestingly, though the

French/US exchange rate was identified as the third specific factor, a number of European exchange rates matched the third factor very closely. This might point to the importance of US-EU trade relations, and the fact that European countries are especially sensitive to changes in US demand conditions. Indeed, US-EU trade currently accounts for almost half of global economic output and a third of global trade flows (Shapiro, 2013). According to the European Commission (2013), the US-EU trade relationship is the largest bilateral trade relationship in the world.

The results obtained for the first sub-period will be discussed next.

First sub-period: 1979Q3-1990Q4

After conducting the dynamic factor analysis on the sample as a whole, the first sub-period is then used to run the estimation again. This period of time is commonly seen as one during which few emerging economies had yet started to properly globalize and the analysis will shed light on what happened to levels of co-movement during this time.

The data is standardized once again before the number of factors to be estimated is specified. In order to rule out the possibility that any changes in results are driven by a change in the number of factors specified, the number of factors is again specified as three, for this sub-period and both others.

In keeping with the results found for the overall period, this first sub-period shows that common components explained little of the co-movement between variables. As would be expected, given the fact that emerging market economies had not yet started to fully globalize during this period, the analysis of the variance share of common components shows that, where 80 per cent or more of variance is explained by a common component, these could be ascribed to advanced economies. During this period then, there was decoupling between advanced and emerging economies. Where co-movement did occur, it happened between advanced economies. Once again, trade and the local exchange rate *vis à vis* the US dollar are important in explaining these higher levels of co-movement.

The variance share of each individual factor is estimated once again in order to ascertain exactly which variables are represented by the estimated factors. The analysis shows that trade, business cycles and interest rates are most responsible for driving co-movement.

Once again, US imports are identified as the first factor, while the second factor is identified as being long-term interest rates in the United States, and the third factor is the Japanese business cycle.

US imports, as previously explained, are an important factor in determining global co-movement, as the US remains a very important trading partner for many countries, both advanced and emerging alike.

Similarly, the Federal Reserve Bank in America is the leading monetary institution, with many global economies making decisions on their own interest rates based on what the Fed's latest decision is. Long term interest rate changes could also have an influence on US investment, stocks and GDP. Changes in these variables could spill over to other countries via decreased demand, for instance, which could influence the US's trade with and investment in other countries.

The fact that Japan's business cycle is the third explanatory factor in this sub-period is interesting, given the US's prominence in the analysis thus far. However, Japan is a member of the G-7 and is also an influential economy and key trading partner, so the fact that the Japanese business cycle is important is not unusual. During this period specifically, the Japanese economy had come off of two decades of strong economic growth and industrialization. Japan was a major exporting country, responsible for manufacturing a large share of the world's semiconductors, which are used in many electronic devices and computers. The country had risen in a short time since the second World War to become the third largest economy in the world, and during the 1980s Tokyo's Stock Exchange rose to become the largest securities exchange in the world. Japan experienced a slight economic slump in the early 1980s, though from the

mid-80s it enjoyed another expansion, largely due to increased domestic demand[4]. Japan's strong growth during this time, and its role as manufacturer of important inputs for other countries, explains the fact that the Japanese business cycle was an important factor driving global co-movement during this sub-period.

The second sub-period focuses on a time when globalization became much more forceful and will be discussed next.

Second sub-period: 1991Q1-2000Q4

The second sub-period is one during which many emerging market economies started to slowly globalize. During this time, many emerging markets started liberalizing their economies and generally implementing macroeconomic reforms. As would be expected, the analysis of the variance share obtained for this sub-period shows that some emerging markets do start to co-move with more advanced economies, with variance shares of 50 per cent and above being observed a bit more frequently. No emerging market variables can be said to be explained more than 80 per cent by a common component during this time, however. Much of the variance in common components is still largely explained by the trade levels and business cycles of advanced economies, as those are the variables for which 80 per cent or more of variance is explained by a common component.

Following the necessary steps to more clearly identify the specific factors which drive co-movement, it is found that trade, exchange rates, and short term interest rates are important drivers of co-movement during this time.

The specific factors identified are: US imports, the French/US exchange rate, and short-term US interest rate. These results correspond to the factors originally found for the overall period of 1979Q3 to 2011Q2.

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[4] By 1989, it was evident that the growth Japan had experienced for much of the 1980s was a bubble. The bubble soon burst and 1990 heralded the onset of what has come to be known as the Lost Decade for the Japanese economy. For a more detailed account of the Japanese economic history that led up to this bubble, see Colombo, J. (2012).

Third sub-period: 2001Q1-2011Q2

The final sub-period is the period of most interest, as it is during this time that the 2008 financial crisis occurred. In this last decade, many emerging markets also started growing especially strongly, with notable emerging markets such as the BRIC economies averaging annual GDP growth rates of around 9 per cent per annum.

Many emerging market economies also managed to uphold their growth levels during the 2008 crisis, when much of the advanced world experienced recession. This strong performance is what first started speculation that emerging economies had decoupled from advanced economies.

Inspecting the results for the variance shares confirms that decoupling occurred during this last period under investigation. Once again, those variables for which the variance is explained more than 80 per cent by a common component, are advanced economies. The number of advanced economies, as well as number of variables for advanced economies, which show a high variance share are much higher than for the previous sub-samples. This shows a strong recoupling between advanced economies during this time period.

Though the results generally show decoupling between emerging and advanced economies, there are a few exceptions. Some emerging market economies do seem to have recoupled to advanced economies during this time period, with variance shares of 80 and above. These economies are: Singapore, the Philippines, Malaysia, Korea and Mexico. For all these economies, the high variance share can be attributed to imports or exports, showing that trade is an important transmission mechanism for these emerging economies. It is also interesting to note that many of these economies are Asian. This result appears to highlight the importance of regionality in decoupling, as investigated by Artis *et al.* (2011), and mentioned in the literature review. It is likely that Mexico's proximity to the United States explains the high level of co-movement caused by trade. Indeed, Mexico is ranked by the United States Census Bureau as one of America's top trading partners, accounting for 13.2 per cent of US total trade (USCB, 2013). For

Mexico, the US is that country's largest trading partner, buying up to as much as 80 per cent of Mexico's exports (USembassy, 2013).

Using the variance share of each factor to identify the specific variables driving co-movement, the factors responsible for co-movement during this time are identified as imports, business cycles, and the local vs. US exchange rate. Specifically, US imports, the US business cycle and the French/US exchange rate are the three factors that were identified in the estimation.

This confirms the results which were found in previous estimations, for both the sample as a whole and the 1990Q1-2000Q4 sub-period. The same logic applies for why these factors are prominent. Once again, the US exchange rate of a number of advanced European economies closely matched the second factor, indicating that US-EU trade remained important during this last decade under investigation.

It seems that trade once again was an important transmission channel of the US business cycle, which experienced a recession due to the 2008 financial crisis.

Comparison between sub-periods

Comparing the results for the various sub-periods side-by side is an interesting exercise as it allows a glimpse of the dynamics of co-movement during this total time period under investigation (see Appendix 1 for a summary of results).

Firstly, it becomes clear that trade is an important factor contributing to co-movement. In all sub-periods analysed, the variables which consistently showed the highest variance shares were imports and exports, with exchange rates also featuring. The importance of trade, and especially of the US as a trading partner in all periods, is confirmed by the fact that US imports was also the number one factor explaining co-movement in all sub-periods, as well as for the period under investigation overall. Throughout the overall sample and in the various sub-samples as well, the French exchange rate with the Dollar also comes to the fore as a determining factor of co-movement. Many other advanced European countries show patterns similar to the exchange rate factor, showing perhaps that it is not the French economy alone but Europe as a whole that

has enjoyed close trading ties with the US during this period. These trading ties however do leave economies susceptible to US-driven crises.

In two consecutive sub-periods, namely 1979Q3-1990Q4 and 1991Q1-2000Q4, the dominance of US monetary policy can be seen in the fact that US interest rates are determining factors of the co-movement to be seen in the observed variables. In the last sub-period, however, the US business cycle replaces interest rates as a determining factor. This could be indicative of the impact that the 2008 financial crisis had.

It is also clear when comparing the various sub-periods that the level of co-movement among advanced economies particularly did increase decade after decade. In the first sub-period, there are very few variables whose variance can be attributed 80 per cent or more to a common component. This gradually increases until the last sub-period, when the 2008 financial crisis occurred, and many variables are being driven by a common component.

It is also interesting to note that, though the co-movement which does occur through various sub-periods can mostly be attributed to advanced European economies, it could be argued that emerging markets also gradually recoupled to advanced economies, albeit less severely. (Due to the fact that more emerging economies have variance shares of 50 and more during this time, though few reach a level of 80 – Appendix 1).

5. Conclusion

The adage that, when America sneezes, the rest of the world catches a cold, is grounded in the influential role that the US economy plays globally. As a key trading partner and issuer of the global reserve currency, changes in the US business cycle do influence other economies.

A key question is whether these spillovers influence different types of economies in different ways. Recently, as the 2008 financial crisis which originated in America spread throughout the world, that question specifically focused on whether emerging markets were any different to advanced economies in their sensitivity to these global spillovers.

Could emerging markets continue growing even though the US, and much of the rest of the advanced world, were slowing down?

The literature on the issue of co-movement between emerging markets and advanced economies doesn't reach a clear consensus on this. There is no clear consensus regarding the decoupling or recoupling of emerging markets to advanced economies. Specifically, there is a lack of studies so far which analyse the dynamics of co-movement between these economies prior to, during and after the 2008 financial crisis.

This paper has aimed to contribute to this gap in knowledge by using dynamic factor analysis to determine the degree to which common components explain co-movement in various real and nominal variables for a set of 32 emerging market and advanced economies. The sample used ranges from the third quarter of 1979 to the second quarter of 2011, thereby giving a long-run view of co-movement prior to and immediately after the crisis.

For the overall sample, the results show that common factors explain little of the variance in the observed variables. Advanced economies show some level of co-movement, but emerging markets seem to have decoupled from these economies during the overall period under investigation.

In order to gain a more dynamic view of patterns of co-movement during this time, the overall sample is divided into sub-periods and the model is estimated again. For the first two sub-periods (1979Q3-1990Q4 and 1991Q1-2000Q4), the results echo those of the overall period: Common factors explain little of the variance in observed variables, and where common factors do play a significant role, they do so for advanced economies. Emerging markets do not appear to be coupling with the advanced economies in the sample at all.

The last sub-period (2001Q1-2011Q2) is the period during which the 2008 financial crisis took place. This period shows very strong coupling between emerging market economies. Some individual emerging market economies strongly co-move with the global factor, notably a select few Asian economies. In general, there was some slight

level of recoupling for emerging markets, though for most, the common factors do not explain more than 80 per cent in the variance of observed variables.

Factors that were consistently identified as being global drivers of co-movement in the sample were US imports and exchange rates, signifying the continued importance of the United States as a trading partner.

In general then, emerging markets do seem to be decoupling from advanced economies, with slight levels of higher co-movement being observed during the last decade during which the crisis occurred.

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Appendix 1 – Summary of variance shares

Note: The variance share represents the amount of co-movement in a variable that can be attributed to a common component. Variance shares marked in red indicate variables for which 80 per cent or more of co-movement is caused by a common component; those marked in blue indicate variables for which 50 per cent or more can be attributed to a common component.

1979Q3-1990Q4		**1991Q1-2000Q4**		**2001Q1-2011Q2**		**1979Q3-2011Q2**	
Oil price	0.1555882	Oil price	0.4170874	Oil price	0.6369079	Oil price	0.3985434
RGDP_Arg	0.2133218	RGDP_Arg	0.0415549	RGDP_Arg	0.2512205	RGDP_Arg	0.1068834
CPI_Arg	0.037156	CPI_Arg	0.074606	CPI_Arg	0.0196364	CPI_Arg	0.0234514
Rshort_Arg	0.0556145	Rshort_Arg	0.3772378	Rshort_Arg	0.2196223	Rshort_Arg	0.0236235
Exports_Arg	0.1677979	Exports_Arg	0.5027423	Exports_Arg	0.2905683	Exports_Arg	0.0609699
Imports_Arg	0.0916246	Imports_Arg	0.0558456	Imports_Arg	0.2486955	Imports_Arg	0.0758421
Cycle_Arg	0.569888	Cycle_Arg	0.1314606	Cycle_Arg	0.4140285	Cycle_Arg	0.0518426
Exch.rate_Arg	0.2192059	Exch.rate_Arg	0.2981769	Exch.rate_Arg	0.0294863	Exch.rate_Arg	0.0076392
RGDP_Austral	0.3356477	RGDP_Austral	0.1372669	RGDP_Austral	0.1318615	RGDP_Austral	0.105226
CPI_Austral	0.0287054	CPI_Austral	0.1132308	CPI_Austral	0.1439304	CPI_Austral	0.017905
Rshort_Austral	0.0431206	Rshort_Austral	0.4919835	Rshort_Austral	0.8396434	Rshort_Austral	0.0984575
Exports_Austral	0.0110062	Exports_Austral	0.0622904	Exports_Austral	0.256775	Exports_Austral	0.073732
Imports_Austral	0.295636	Imports_Austral	0.4617906	Imports_Austral	0.8280226	Imports_Austral	0.4696959
Cycle_Austral	0.3769662	Cycle_Austral	0.4782783	Cycle_Austral	0.2881999	Cycle_Austral	0.2256067
Exch.rate_Austral	0.061331	Exch.rate_Austral	0.3452494	Exch.rate_Austral	0.8086203	Exch.rate_Austral	0.3975112
RGDP_Austria	0.0795545	RGDP_Austria	0.050765	RGDP_Austria	0.2542698	RGDP_Austria	0.1362079
CPI_Austria	0.1308135	CPI_Austria	0.0364942	CPI_Austria	0.2528917	CPI_Austria	0.1536734
Rshort_Austria	0.4379475	Rshort_Austria	0.4759915	Rshort_Austria	0.8419016	Rshort_Austria	0.4699516
Exports_Austria	0.7706805	Exports_Austria	0.8194455	Exports_Austria	0.854809	Exports_Austria	0.8067346
Imports_Austria	0.6532973	Imports_Austria	0.6909341	Imports_Austria	0.767662	Imports_Austria	0.7181822
Cycle_Austria	0.1541126	Cycle_Austria	0.1229409	Cycle_Austria	0.7496351	Cycle_Austria	0.3984954
Exch.rate_Austria	0.8679628	Exch.rate_Austria	0.8346873	Exch.rate_Austria	0.9339109	Exch.rate_Austria	0.8985728

RGDP_Belgium	0.4846699	RGDP_Belgium	0.202107	RGDP_Belgium	0.7838239	RGDP_Belgium	0.3869489
CPI_Belgium	0.1430227	CPI_Belgium	0.0799614	CPI_Belgium	0.2100788	CPI_Belgium	0.205052
Rshort_Belgium	0.1832413	Rshort_Belgium	0.2659501	Rshort_Belgium	0.8419016	Rshort_Belgium	0.2505758
Cycle_Belgium	0.7029876	Cycle_Belgium	0.3610722	Cycle_Belgium	0.9104316	Cycle_Belgium	0.7399905
Exch.rate_belgium	0.8628666	Exch.rate_belgium	0.8509117	Exch.rate_belgium	0.9339366	Exch.rate_belgium	0.8959633
RGDP_Brazil	0.2042432	RGDP_Brazil	0.2970193	RGDP_Brazil	0.5302794	RGDP_Brazil	0.2226115
CPI_Brazil	0.0391895	CPI_Brazil	0.1052557	CPI_Brazil	0.0313415	CPI_Brazil	0.0009447
Rshort_brazil	0.1801256	Rshort_brazil	0.2514764	Rshort_brazil	0.0596228	Rshort_brazil	0.0386092
Exports_brazil	0.0265447	Exports_brazil	0.1072511	Exports_brazil	0.202695	Exports_brazil	0.0348037
Imports_brazil	0.0266048	Imports_brazil	0.1073422	Imports_brazil	0.4495054	Imports_brazil	0.0322248
Cycle_brazil	0.3552535	Cycle_brazil	0.4576706	Cycle_brazil	0.6714584	Cycle_brazil	0.3215
Exch.rate_brazil	0.3953039	Exch.rate_brazil	0.0714609	Exch.rate_brazil	0.1885362	Exch.rate_brazil	0.0942085
RGDP_Canada	0.413677	RGDP_Canada	0.543809	RGDP_Canada	0.6072307	RGDP_Canada	0.2398703
CPI_Canada	0.097395	CPI_Canada	0.0120756	CPI_Canada	0.164342	CPI_Canada	0.0972111
Rshort_canada	0.4653463	Rshort_canada	0.3082872	Rshort_canada	0.3009677	Rshort_canada	0.2055158
Exports_canada	0.3398667	Exports_canada	0.3218138	Exports_canada	0.6303975	Exports_canada	0.4608657
Imports_canada	0.3351223	Imports_canada	0.230996	Imports_canada	0.2277076	Imports_canada	0.1547716
Cycle_canada	0.460819	Cycle_canada	0.6396537	Cycle_canada	0.8488095	Cycle_canada	0.5369375
Exch.rate_canada	0.1598477	Exch.rate_canada	0.0454478	Exch.rate_canada	0.5833175	Exch.rate_canada	0.376769
RGDP_chile	0.3586043	RGDP_chile	0.0647948	RGDP_chile	0.3493231	RGDP_chile	0.1458087
CPI_chile	0.0464319	CPI_chile	0.1847345	CPI_chile	0.4053153	CPI_chile	0.0036736
Rshort_chile	0.0348562	Rshort_chile	0.1281705	Rshort_chile	0.4196547	Rshort_chile	0.020398
Exports_chile	0.1377169	Exports_chile	0.1530165	Exports_chile	0.6188133	Exports_chile	0.3074777
Imports_chile	0.0221478	Imports_chile	0.1176602	Imports_chile	0.5100316	Imports_chile	0.150772
Cycle_chile	0.2274818	Cycle_chile	0.163728	Cycle_chile	0.7083681	Cycle_chile	0.2490797
Exch.rate_chile	0.1674076	Exch.rate_chile	0.0661565	Exch.rate_chile	0.4092537	Exch.rate_chile	0.2750752
RGDP_china	0.3811101	RGDP_china	0.1729473	RGDP_china	0.3862064	RGDP_china	0.0922034
CPI_china	0.0398622	CPI_china	0.0935062	CPI_china	0.1929718	CPI_china	0.0493285
Exports_china	0.0538622	Exports_china	0.0931669	Exports_china	0.6435377	Exports_china	0.2367592

Imports_china	0.065165	Imports_china	0.0830867	Imports_china	0.7088057	Imports_china	0.2258325
Cycle_china	0.3285018	Cycle_china	0.3508477	Cycle_china	0.5262632	Cycle_china	0.0359795
Exch.rate_china	0.0649351	Exch.rate_china	0.0376306	Exch.rate_china	0.5095148	Exch.rate_china	0.0068933
CPI_finland	0.1112285	CPI_finland	0.0440888	CPI_finland	0.3024493	CPI_finland	0.159659
Rshort_finland	0.0924055	Rshort_finland	0.5235877	Rshort_finland	0.8498687	Rshort_finland	0.213152
Exports_finland	0.307043	Exports_finland	0.4697983	Exports_finland	0.6771222	Exports_finland	0.480469
Imports_finland	0.1760762	Imports_finland	0.4740126	Imports_finland	0.8889455	Imports_finland	0.3786815
Exch.rate_finland	0.7705801	Exch.rate_finland	0.7573234	Exch.rate_finland	0.9338704	Exch.rate_finland	0.8051038
RGDP_france	0.138448	RGDP_france	0.3106999	RGDP_france	0.6631155	RGDP_france	0.3235736
CPI_france	0.073521	CPI_france	0.2321622	CPI_france	0.194187	CPI_france	0.1455156
Rshort_france	0.3004612	Rshort_france	0.1651881	Rshort_france	0.8419016	Rshort_france	0.2655717
Exports_france	0.7926362	Exports_france	0.8525159	Exports_france	0.9008891	Exports_france	0.836715
Imports_france	0.8431093	Imports_france	0.8247738	Imports_france	0.9282825	Imports_france	0.8630792
Cycle_france	0.5582482	Cycle_france	0.0437238	Cycle_france	0.8486121	Cycle_france	0.4403067
Exch.rate_france	0.828355	Exch.rate_france	0.829775	Exch.rate_france	0.9339966	Exch.rate_france	0.8783663
RGDP_germany	0.1137568	RGDP_germany	0.0862818	RGDP_germany	0.7003145	RGDP_germany	0.275582
CPI_germany	0.0627012	CPI_germany	0.0797195	CPI_germany	0.2094578	CPI_germany	0.1211214
Rshort_germany	0.4983177	Rshort_germany	0.5038582	Rshort_germany	0.8419016	Rshort_germany	0.541145
Exports_germany	0.6684172	Exports_germany	0.8492371	Exports_germany	0.8676031	Exports_germany	0.793881
Imports_germany	0.7685478	Imports_germany	0.6753483	Imports_germany	0.8178419	Imports_germany	0.770363
Cycle_germany	0.1830744	Cycle_germany	0.2927913	Cycle_germany	0.8307969	Cycle_germany	0.4476139
Exch.rate_germany	0.875893	Exch.rate_germany	0.8392985	Exch.rate_germany	0.9338119	Exch.rate_germany	0.9013251
RGDP_india	0.0300397	RGDP_india	0.0605612	RGDP_india	0.023898	RGDP_india	0.0159954
CPI_india	0.045071	CPI_india	0.3512931	CPI_india	0.0187902	CPI_india	0.0108662
Exports_india	0.0421039	Rshort_india	0.0950979	Rshort_india	0.5038883	Rshort_india	0.1278061
Imports_india	0.1079241	Exports_india	0.0048625	Exports_india	0.2514985	Exports_india	0.0732238
Cycle_india	0.1778377	Imports_india	0.2104703	Imports_india	0.5025756	Imports_india	0.2742491
Exch.rate_india	0.2679921	Cycle_india	0.2643099	Cycle_india	0.1818803	Cycle_india	0.0977094
RGDP_indonesia	0.1301669	Exch.rate_india	0.2010636	Exch.rate_india	0.5070995	Exch.rate_india	0.3366985

CPI_indonesia	0.028671	RGDP_indonesia	0.147664	RGDP_indonesia	0.211844	RGDP_indonesia	0.0769786
Rshort_indonesia	0.1520576	CPI_indonesia	0.2726539	CPI_indonesia	0.067785	CPI_indonesia	0.0574562
Exports_indonesia	0.1314274	Rshort_indonesia	0.2915571	Rshort_indonesia	0.2266242	Rshort_indonesia	0.0763785
Imports_indonesia	0.1528079	Exports_indonesia	0.3395396	Exports_indonesia	0.697079	Exports_indonesia	0.3195743
Cycle_indonesia	0.1898765	Imports_indonesia	0.2617369	Imports_indonesia	0.4763674	Imports_indonesia	0.1629627
Exch.rate_indonesia	0.0586582	Cycle_indonesia	0.0760735	Cycle_indonesia	0.3792371	Cycle_indonesia	0.0890534
RGDP_italy	0.4574386	Exch.rate_indonesia	0.375365	Exch.rate_indonesia	0.4728903	Exch.rate_indonesia	0.197834
CPI_italy	0.1004643	RGDP_italy	0.2135552	RGDP_italy	0.5963102	RGDP_italy	0.341625
Rshort_italy	0.2490196	CPI_italy	0.0610665	CPI_italy	0.423467	CPI_italy	0.1399946
Exports_italy	0.4095689	Rshort_italy	0.4626976	Rshort_italy	0.8190259	Rshort_italy	0.3006614
Imports_italy	0.4384259	Exports_italy	0.7723135	Exports_italy	0.8536159	Exports_italy	0.6535302
Cycle_italy	0.6331065	Imports_italy	0.7634893	Imports_italy	0.9074464	Imports_italy	0.6827699
Exch.rate_italy	0.8142475	Cycle_italy	0.4124243	Cycle_italy	0.8843919	Cycle_italy	0.7533928
RGDP_japan	0.0529963	Exch.rate_italy	0.6252378	Exch.rate_italy	0.9340197	Exch.rate_italy	0.810533
CPI_japan	0.0651501	RGDP_japan	0.0121011	RGDP_japan	0.5811836	RGDP_japan	0.2328241
Rshort_japan	0.2387396	CPI_japan	0.037805	CPI_japan	0.3575258	CPI_japan	0.1063408
Exports_japan	0.2334771	Rshort_japan	0.4087838	Rshort_japan	0.4919639	Rshort_japan	0.1145841
Imports_japan	0.3021185	Exports_japan	0.3260916	Exports_japan	0.7356473	Exports_japan	0.5188052
Cycle_japan	0.6425632	Imports_japan	0.5131113	Imports_japan	0.7028275	Imports_japan	0.4886053
Exch.rate_japan	0.4584766	Cycle_japan	0.4851057	Cycle_japan	0.9044855	Cycle_japan	0.4068276
RGDP_korea	0.1009767	Exch.rate_japan	0.3307723	Exch.rate_japan	0.101913	Exch.rate_japan	0.3102647
CPI_korea	0.074499	RGDP_korea	0.3529382	RGDP_korea	0.5283442	RGDP_korea	0.1275881
Rshort_korea	0.1132738	CPI_korea	0.0142033	CPI_korea	0.1816827	CPI_korea	0.0265405
Exports_korea	0.241039	Rshort_korea	0.0551467	Rshort_korea	0.7835772	Rshort_korea	0.0756501
Imports_korea	0.1103635	Exports_korea	0.2038917	Exports_korea	0.8046107	Exports_korea	0.4298577
Cycle_korea	0.2655051	Imports_korea	0.4751153	Imports_korea	0.8404789	Imports_korea	0.510229
Exch.rate_korea	0.1580184	Cycle_korea	0.0430507	Cycle_korea	0.7315852	Cycle_korea	0.2085977
RGDP_malaysia	0.3054994	Exch.rate_korea	0.2000467	Exch.rate_korea	0.7434634	Exch.rate_korea	0.3467227
CPI_malaysia	0.3155719	RGDP_malaysia	0.3621229	RGDP_malaysia	0.7194249	RGDP_malaysia	0.3463584

Rshort_malaysia	0.5360423	CPI_malaysia	0.2530566	CPI_malaysia	0.3764535	CPI_malaysia	0.1698388
Exports_malaysia	0.1604462	Rshort_malaysia	0.536796	Rshort_malaysia	0.7397929	Rshort_malaysia	0.0890823
Imports_malaysia	0.3268685	Exports_malaysia	0.4270132	Exports_malaysia	0.7852359	Exports_malaysia	0.4919341
Cycle_malaysia	0.22497	Imports_malaysia	0.4179471	Imports_malaysia	0.8040579	Imports_malaysia	0.4987904
Exch.rate_malaysia	0.3147686	Cycle_malaysia	0.1022947	Cycle_malaysia	0.8836786	Cycle_malaysia	0.2653667
RGDP_mexico	0.3800676	Exch.rate_malaysia	0.3279702	Exch.rate_malaysia	0.4759601	Exch.rate_malaysia	0.1961772
CPI_mexico	0.070751	RGDP_mexico	0.102662	RGDP_mexico	0.5934926	RGDP_mexico	0.2623219
Rshort_mexico	0.0592176	CPI_mexico	0.1400364	CPI_mexico	0.0336448	CPI_mexico	0.0482064
Exports_mexico	0.0498938	Rshort_mexico	0.1942982	Rshort_mexico	0.0975963	Rshort_mexico	0.0466386
Imports_mexico	0.5760992	Exports_mexico	0.0299734	Exports_mexico	0.1165146	Exports_mexico	0.0495127
Cycle_mexico	0.3306205	Imports_mexico	0.0950514	Imports_mexico	0.8835247	Imports_mexico	0.2921559
Exch.rate_mexico	0.3651373	Cycle_mexico	0.0086533	Cycle_mexico	0.9349522	Cycle_mexico	0.2092719
RGDP_netherlands	0.1174134	Exch.rate_mexico	0.175176	Exch.rate_mexico	0.4554627	Exch.rate_mexico	0.2330006
CPI_netherlands	0.1785858	RGDP_netherlands	0.2974766	RGDP_netherlands	0.7425389	RGDP_netherlands	0.2461252
Rshort_netherlands	0.2691873	CPI_netherlands	0.0080696	CPI_netherlands	0.0616197	CPI_netherlands	0.0932902
Exports_netherlands	0.6596569	Rshort_netherlands	0.4947913	Rshort_netherlands	0.8419016	Rshort_netherlands	0.3717637
Imports_netherlands	0.5916573	Exports_netherlands	0.8100966	Exports_netherlands	0.9134696	Exports_netherlands	0.8027793
Cycle_netherlands	0.3452708	Imports_netherlands	0.8083695	Imports_netherlands	0.9235114	Imports_netherlands	0.7808715
Exch.rate_netherlands	0.8848712	Cycle_netherlands	0.2350676	Cycle_netherlands	0.7807905	Cycle_netherlands	0.5313065
RGDP_newzealand	0.1043799	Exch.rate_netherlands	0.8453093	Exch.rate_netherlands	0.9339885	Exch.rate_netherlands	0.9065656
CPI_newzealand	0.0911699	RGDP_newzealand	0.5391236	RGDP_newzealand	0.2289844	RGDP_newzealand	0.1566507
Rshort_newzealand	0.0255757	CPI_newzealand	0.0882142	CPI_newzealand	0.0732112	CPI_newzealand	0.0468118
Exports_newzealand	0.1737512	Rshort_newzealand	0.1490553	Rshort_newzealand	0.7624649	Rshort_newzealand	0.0151395
Imports_newzealand	0.2684471	Exports_newzealand	0.3207003	Exports_newzealand	0.6377973	Exports_newzealand	0.3797484
Cycle_newzealand	0.052381	Imports_newzealand	0.3406777	Imports_newzealand	0.7788015	Imports_newzealand	0.4229016
Exch.rate_newzealand	0.3030723	Cycle_newzealand	0.4811209	Cycle_newzealand	0.5556765	Cycle_newzealand	0.177394
RGDP_norway	0.0886219	Exch.rate_newzealand	0.6058996	Exch.rate_newzealand	0.7398984	Exch.rate_newzealand	0.5170548
CPI_norway	0.0159033	RGDP_norway	0.06082	RGDP_norway	0.0943502	RGDP_norway	0.0604583
Rshort_norway	0.0231072	CPI_norway	0.0849995	CPI_norway	0.0633691	CPI_norway	0.0329493

Exports_norway	0.3854774	Rshort_norway	0.0860609	Rshort_norway	0.7093563	Rshort_norway	0.1196292
Imports_norway	0.4044143	Exports_norway	0.5378734	Exports_norway	0.7376843	Exports_norway	0.5338575
Cycle_norway	0.199522	Imports_norway	0.5376217	Imports_norway	0.6144858	Imports_norway	0.534737
Exch.rate_norway	0.7727145	Cycle_norway	0.4815847	Cycle_norway	0.5499706	Cycle_norway	0.210663
RGDP_peru	0.0539925	Exch.rate_norway	0.7568441	Exch.rate_norway	0.8037222	Exch.rate_norway	0.7618065
CPI_peru	0.4256885	RGDP_peru	0.0613766	RGDP_peru	0.4367698	RGDP_peru	0.0194189
Rshort_peru	0.2772379	CPI_peru	0.6557652	CPI_peru	0.2738179	CPI_peru	0.0734852
Exports_peru	0.0016219	Rshort_peru	0.2856544	Rshort_peru	0.6076824	Rshort_peru	0.0629228
Imports_peru	0.3111162	Exports_peru	0.059887	Exports_peru	0.2926122	Exports_peru	0.0125535
Cycle_peru	0.1715669	Imports_peru	0.529186	Imports_peru	0.6968986	Imports_peru	0.0347815
Exch.rate_peru	0.2788031	Cycle_peru	0.5332605	Cycle_peru	0.5635976	Cycle_peru	0.0075536
RGDP_Philippines	0.0093548	Exch.rate_peru	0.3226494	Exch.rate_peru	0.3655151	Exch.rate_peru	0.1329349
CPI_philippines	0.0378016	RGDP_Philippines	0.3570519	RGDP_Philippines	0.3074454	RGDP_Philippines	0.0481697
Rshort_philippines	0.0754107	CPI_philippines	0.0546121	CPI_philippines	0.4679196	CPI_philippines	0.0462431
Exports_philippines	0.2074682	Rshort_philippines	0.1352309	Rshort_philippines	0.0367943	Rshort_philippines	0.0433172
Imports_philippines	0.3436778	Exports_philippines	0.0266324	Exports_philippines	0.5624402	Exports_philippines	0.115605
Cycle_philippines	0.2161174	Imports_philippines	0.5054197	Imports_philippines	0.8438077	Imports_philippines	0.1375152
Exch.rate_philippines	0.0332407	Cycle_philippines	0.3344022	Cycle_philippines	0.6892464	Cycle_philippines	0.1395227
RGDP_singapore	0.2674484	Exch.rate_philippines	0.5486863	Exch.rate_philippines	0.2327772	Exch.rate_philippines	0.1709218
CPI_singapore	0.4079946	RGDP_singapore	0.3518242	RGDP_singapore	0.5275777	RGDP_singapore	0.3941899
Rshort_singapore	0.2764596	CPI_singapore	0.1800334	CPI_singapore	0.4217327	CPI_singapore	0.3064249
Exports_singapre	0.425713	Rshort_singapore	0.2795863	Rshort_singapore	0.2271473	Rshort_singapore	0.1379522
Imports_singapore	0.3201237	Exports_singapre	0.3984076	Exports_singapre	0.8647805	Exports_singapre	0.6554342
Cycle_singapore	0.4476266	Imports_singapore	0.3932626	Imports_singapore	0.840118	Imports_singapore	0.5951136
Exch.rate_singapore	0.414655	Cycle_singapore	0.3525822	Cycle_singapore	0.7567832	Cycle_singapore	0.4948683
RGDP_southafrica	0.3519097	Exch.rate_singapore	0.543327	Exch.rate_singapore	0.6495408	Exch.rate_singapore	0.4382302
CPI_southafrica	0.0100472	RGDP_southafrica	0.5413117	RGDP_southafrica	0.6701006	RGDP_southafrica	0.2977312
Rshort_southafrica	0.2185234	CPI_southafrica	0.0531169	CPI_southafrica	0.065858	CPI_southafrica	0.0181056
Exports_southafrica	0.0353919	Rshort_southafrica	0.3151667	Rshort_southafrica	0.3707741	Rshort_southafrica	0.0803985

Imports_southafrica	0.2149967	Exports_southafrica	0.0931944	Exports_southafrica	0.2599412	Exports_southafrica	0.1124106
Cycle_southafrica	0.5327785	Imports_southafrica	0.1042339	Imports_southafrica	0.5812362	Imports_southafrica	0.2679337
Exch.rate_southafrica	0.0658852	Cycle_southafrica	0.4097707	Cycle_southafrica	0.8126601	Cycle_southafrica	0.4468608
RGDP_spain	0.3324601	Exch.rate_southafrica	0.2362464	Exch.rate_southafrica	0.4815555	Exch.rate_southafrica	0.3365251
CPI_spain	0.0224206	RGDP_spain	0.5191815	RGDP_spain	0.4213506	RGDP_spain	0.2473804
Rshort_spain	0.0281177	CPI_spain	0.0819102	CPI_spain	0.224136	CPI_spain	0.0935615
Exports_spain	0.1121477	Rshort_spain	0.06645	Rshort_spain	0.8440605	Rshort_spain	0.0134015
Imports_spain	0.4137821	Exports_spain	0.5818947	Exports_spain	0.8627631	Exports_spain	0.3498755
Cycle_spain	0.6431332	Imports_spain	0.6879147	Imports_spain	0.8477369	Imports_spain	0.6094261
Exch.rate_spain	0.7433035	Cycle_spain	0.3301945	Cycle_spain	0.7775308	Cycle_spain	0.5055708
RGDP_sweden	0.0872378	Exch.rate_spain	0.7388675	Exch.rate_spain	0.9339368	Exch.rate_spain	0.7937543
CPI_sweden	0.1190766	RGDP_sweden	0.2960669	RGDP_sweden	0.6102969	RGDP_sweden	0.3620356
Rshort_sweden	0.062529	CPI_sweden	0.0209992	CPI_sweden	0.2455976	CPI_sweden	0.1011528
Exports_sweden	0.519288	Rshort_sweden	0.5515548	Rshort_sweden	0.770773	Rshort_sweden	0.1335516
Imports_sweden	0.5275121	Exports_sweden	0.7162411	Exports_sweden	0.873737	Exports_sweden	0.6889748
Cycle_sweden	0.5372257	Imports_sweden	0.7432163	Imports_sweden	0.8842762	Imports_sweden	0.7160167
Exch.rate_sweden	0.6672669	Cycle_sweden	0.279588	Cycle_sweden	0.8206923	Cycle_sweden	0.6274058
RGDP_switzerland	0.4428682	Exch.rate_sweden	0.6128002	Exch.rate_sweden	0.8809738	Exch.rate_sweden	0.7190286
CPI_switzerland	0.1225899	RGDP_switzerland	0.2359089	RGDP_switzerland	0.644224	RGDP_switzerland	0.4024566
Rshort_switzerland	0.0884203	CPI_switzerland	0.0989545	CPI_switzerland	0.2802409	CPI_switzerland	0.1626597
Exports_switzerland	0.6971535	Rshort_switzerland	0.2653206	Rshort_switzerland	0.3398171	Rshort_switzerland	0.1143508
Imports_switzerland	0.6027625	Exports_switzerland	0.7257289	Exports_switzerland	0.7970399	Exports_switzerland	0.7484115
Cycle_switzerland	0.6369995	Imports_switzerland	0.7526084	Imports_switzerland	0.7601606	Imports_switzerland	0.6682446
Exch.rate_switzerland	0.8300004	Cycle_switzerland	0.2691855	Cycle_switzerland	0.7608544	Cycle_switzerland	0.6117294
RGDP_thailand	0.1974034	Exch.rate_switzerland	0.8108655	Exch.rate_switzerland	0.8049725	Exch.rate_switzerland	0.8361005
CPI_thailand	0.2814889	RGDP_thailand	0.3308239	RGDP_thailand	0.7236633	RGDP_thailand	0.2677519
Rshort_thailand	0.364304	CPI_thailand	0.1403767	CPI_thailand	0.4934725	CPI_thailand	0.2080784
Exports_thailand	0.2079289	Rshort_thailand	0.0716894	Rshort_thailand	0.2589992	Rshort_thailand	0.1190673
Imports_thailand	0.1735581	Exports_thailand	0.1404702	Exports_thailand	0.5232538	Exports_thailand	0.267765

Cycle_thailand	0.607702	Imports_thailand	0.3170512	Imports_thailand	0.5334757	Imports_thailand	0.3582221
Exch.rate_thailand	0.2688399	Cycle_thailand	0.0348258	Cycle_thailand	0.7940536	Cycle_thailand	0.212286
RGDP_turkey	0.0605132	Exch.rate_thailand	0.2738416	Exch.rate_thailand	0.3132927	Exch.rate_thailand	0.1819547
CPI_turkey	0.0294088	RGDP_turkey	0.0394587	RGDP_turkey	0.5142625	RGDP_turkey	0.1380043
Rshort_turkey	0.1419227	CPI_turkey	0.0352069	CPI_turkey	0.029227	CPI_turkey	0.0099342
Exports_turkey	0.0378303	Rshort_turkey	0.1486466	Rshort_turkey	0.1798047	Rshort_turkey	0.0305743
Imports_turkey	0.0162883	Exports_turkey	0.0408051	Exports_turkey	0.1808411	Exports_turkey	0.0396936
Cycle_turkey	0.2205347	Imports_turkey	0.0571325	Imports_turkey	0.6834612	Imports_turkey	0.1674132
Exch.rate_turkey	0.1979744	Cycle_turkey	0.3169236	Cycle_turkey	0.7476299	Cycle_turkey	0.1693836
RGDP_uk	0.2429959	Exch.rate_turkey	0.5145257	Exch.rate_turkey	0.2943792	Exch.rate_turkey	0.201974
CPI_uk	0.036805	RGDP_uk	0.4864603	RGDP_uk	0.5162721	RGDP_uk	0.1297424
Rshort_uk	0.1483873	CPI_uk	0.1356465	CPI_uk	0.2760044	CPI_uk	0.0592665
Exports_uk	0.4747582	Rshort_uk	0.6877948	Rshort_uk	0.7795731	Rshort_uk	0.260461
Imports_uk	0.4735006	Exports_uk	0.5644228	Exports_uk	0.6474941	Exports_uk	0.5829069
Cycle_uk	0.5471897	Imports_uk	0.5489541	Imports_uk	0.7651538	Imports_uk	0.6224853
Exch.rate_uk	0.5859018	Cycle_uk	0.6176338	Cycle_uk	0.8881845	Cycle_uk	0.5199374
RGDP_usa	0.302665	Exch.rate_uk	0.5894767	Exch.rate_uk	0.7592147	Exch.rate_uk	0.6098969
CPI_usa	0.1745817	RGDP_usa	0.1488191	RGDP_usa	0.6977973	RGDP_usa	0.2923211
Rshort_usa	0.4254071	CPI_usa	0.1163629	CPI_usa	0.3541355	CPI_usa	0.1984876
Rlong_usa	0.4987886	Rshort_usa	0.7243923	Rshort_usa	0.3654084	Rshort_usa	0.2324216
Exports_usa	0.3625211	Rlong_usa	0.354532	Rlong_usa	0.3223218	Rlong_usa	0.2884576
Imports_usa	0.3376309	Exports_usa	0.237619	Exports_usa	0.8819023	Exports_usa	0.5479499
Cycle_usa	0.4538586	Imports_usa	0.6573422	Imports_usa	0.8306064	Imports_usa	0.5858138
Iprod_usa	0.4419772	Cycle_usa	0.5449396	Cycle_usa	0.8614233	Cycle_usa	0.5824898
Sp500_usa	0.0741682	Iprod_usa	0.3328078	Iprod_usa	0.6536301	Iprod_usa	0.3682484
Unemployment_usa	0.6076164	Sp500_usa	0.0984455	Sp500_usa	0.6689159	Sp500_usa	0.2196571
Ppi_usa	0.4640326	Unemployment_usa	0.6889348	Unemployment_usa	0.279844	Unemployment_usa	0.2509952
Rer_usa	0.2151198	Ppi_usa	0.1943148	Ppi_usa	0.5429148	Ppi_usa	0.4209698
		Rer_usa	0.4426508	Rer_usa	0.1771466	Rer_usa	0.0750952