

## 6

### Possibility of Creating a Common Currency Basket for East Asia\*

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#### Introduction

After East Asian countries experienced the Asian currency crisis, it has been regarded that regional financial cooperation in East Asia is necessary among East Asian countries in order to prevent a currency crisis in the future. A regional financial cooperation has been realized in a form of the Chiang Mai Initiatives that is a network of currency swap arrangements among ASEAN + 3 (China, Japan, and Korea). The movements have given us momentum to activate policy dialogues in a field of international monetary arrangements among East Asian countries. This paper has an objective to consider a desirable regional currency arrangement in East Asia, which is expected to be an important topic in policy dialogue among East Asian countries in the future.

Our experience of the Asian currency crisis remind us of a fact that the de facto dollar peg was inadequate for East Asian countries that have close economic relationships with not only the United States but also Japan, European countries, and intra-regional countries. It follows that if a regional currency arrangement will be established in East Asia, regional currencies should have stable linkages with each other and should be stable in terms of not a single major currency but a currency basket. The EU created a single common currency, the euro, placing its base on the European Currency Unit (ECU), which had been used a currency unit in the EU before they introduced the euro into the EU. In the case of the ECU, member country currencies were linked with the ECU consisted of the member country currencies while the ECU was floating against the US dollar and the Japanese yen. A possible common currency in East Asia will be

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\* The authors are grateful to Takatoshi Ito, Kenjiro Hirayama, Shinichi Fukuda, Munehisa Kasuya, Yuko Hashimoto and participants of the 2002 Spring Meeting of Japan Economic Association and the 2002 Summer Conference of Monetary Economics Group of the Institute of Statistical Research for their useful comments and suggestion. We thank Yu Yongding for providing us Chinese data.

**contrast to the ECU.**

In addition, we investigate possibility of creating a common currency basket in East Asia according to the optimal currency area theory. Bayoumi, Eichengreen, and Mauro (2000) used a structural VAR model to make an empirical analysis on an optimal currency area in East Asia. We use a Generalized Purchasing Power Parity (G-PPP) model to analyze the issue. We investigate which parts of East Asian countries will be able to create a common currency area. We have analytical results that ASEAN5 countries and Korea will be able to form a common currency area and that a common currency basket will be more applicable as an anchor currency than the US dollar if these countries form a common currency area.

This paper consists of five sections. Next section places stress on creation of a common currency basket for East Asian countries in order to resolve a kind of coordination failure in exchange rate policies among East Asian countries. In section 3, we empirically analyze whether parts of East Asia will be able to become a common currency area with a currency basket as an anchor currency in order to consider possibility of creating a common currency basket in East Asia. We use a G-PPP model to investigate which of East Asian countries can create a common currency area with a currency basket as an anchor currency. In section 4, we report our empirical results. In section 5, we discuss about policy implication for a common currency area in East Asia from our empirical results. In conclusion, we summarize our consideration on possibility of creating a common currency basket for East Asia.

#### **A common currency basket for East Asian countries**

Some empirical researches found that a currency basket system would contribute to stabilizing trade balances and capital flows in East Asian countries. Ito, Ogawa, and Sasaki (1998) estimated optimal weights on the US dollar and the Japanese yen in a currency basket, which would have stabilized trade balances in East Asian countries before the Asian currency crisis. Results of the estimation showed that the optimal weights on the US dollar were smaller than their actual weights that were estimated by Frankel and Wei (1994) and Kawai and Akiyama (1998). It implies that it was not a *de facto* dollar peg system but a currency basket peg system that would have stabilized their trade balances.

Ogawa and Sun (2001) simulated capital inflows to three crisis-hit countries, which include Thailand, Indonesia, and Korea, under a currency basket peg system where

weights on the US dollar and the Japanese yen had been 50%: 50% in a currency basket. Results of the simulation concluded that the *de facto* dollar peg system stimulated capital inflows to the crisis-hit countries before the Asian currency crisis.

We should consider why the monetary authorities of East Asian countries tended to choose a *de facto* dollar peg system rather than a currency basket peg system. In fact, linkages of East Asian countries to the US dollar recently have returned to the high level before the crisis as McKinnon (2000) and Ogawa (2002a) pointed out. A reason why the monetary authorities are unwilling to adopt a currency basket peg system is related with a kind of coordination failure in choosing exchange rate system. The first mover to a currency basket peg system might temporarily destabilize its relations with the neighbor countries that are still pegged their home currencies to the US dollar as shown in a prisoners' dilemma in a game theory.<sup>1</sup>

Ogawa and Ito (2002) used a theoretical two-country model to examine an optimal exchange rate system for East Asian countries that export goods to the United States, Japan, and neighboring countries in order to minimize the fluctuation of trade balances in home countries, in the environment where the yen-dollar exchange rate fluctuates. It was shown how an East Asian country's choice of the exchange rate system (or weights in the basket) is dependent on the neighbor country's choice. The dollar weights in the currency baskets of the two countries are determined as Nash equilibrium. There may be multiple equilibriums, and a "coordination failure" may result.<sup>2</sup>

Under uncertainty about the future movements in the exchange rate of the US dollar vis-à-vis the Japanese yen, the monetary authorities have higher degree of possibility of facing with the coordination failure in choosing exchange rate system. Suppose that alone the monetary authorities of a country switch their exchange rate policy to the currency basket peg system while the other monetary authorities of the neighbor countries keep the dollar peg system. A currency of the country that adopted the currency basket peg system would appreciate against the currencies of the neighbor countries if the US dollar depreciated against the Japanese yen. Therefore, under such uncertainty, the monetary authorities tend to work out a "wait-and-see" strategy if they are averse to risk.

All of the monetary authorities are likely to take such a "wait-and-see" strategy if they are all risk averse. The situation is a so-called prisoner's dilemma in a game theory.

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<sup>1</sup> Bénassy-Quéré (1999) and Ohno (1999) analyzed how the monetary authorities peg the home currency to the US dollar as a result of a coordination failure.

<sup>2</sup> Ogawa (2002b) and Nakata and Ogawa (2002) conducted empirical analyses on possibility of coordination failure in choosing exchange rate system in East Asia. They found the possibility of the coordination failure among the ASEAN, China, and Korea.

All of the monetary authorities cannot help but choose to keep the dollar peg system, which means Nash equilibrium, even though they should know that there is a better cooperative solution. Coordination among some of the monetary authorities in East Asian countries is necessary for shifting the situation from the Nash equilibrium to a cooperative solution.

A form of coordination is international policy coordination for arrangements of international monetary system. For example, all of the monetary authorities of the countries in a regional area might agree on an arrangement that they create a common currency that consists of a currency basket. They might make references to the common currency in conducting their exchange rate policy. A rigid arrangement is that all of the monetary authorities in the regional area peg their home currencies to a common currency basket. On one hand, one of more flexible arrangements is that they target the home currencies in a wider band around a central exchange rate of the home currencies vis-à-vis a common currency basket.

In either case, it is necessary to create a common currency basket that the monetary authorities of the countries make reference to when they conduct their exchange rate policies. Such regional currency arrangements might help to prevent competitive devaluation among the related currencies in a region. If the monetary authorities of a country devalue its home currency, the devaluation worsens price competitiveness of products made in neighbor countries. For that reason, the monetary authorities of the other countries should have an incentive to devalue their home currency, following the first country's deflator. The regional currency arrangements that the monetary authorities in a region make a commitment to a coordinated exchange rate policy of making references to a common currency basket would prevent from a possible competitive devaluation.

Here we should consider possibility of introducing a common currency basket in East Asia. What is a condition where we can use a common currency basket among some countries? It is clear that optimal weights on currencies in a currency basket should be almost the same among the counties. Thus, an area where a common currency basket is used is related with a common currency area.

According to the optimal currency area theories, possibility of establishing a common currency area in a region depends on whether the region is an optimal currency area or not. It is pointed out in the optimal currency area theories that some factors determine an optimal currency area. Mundell (1961) regarded mobility of labor as a necessity of common currency area while McKinnon (1963) regarded openness of economy as another necessity. Moreover, symmetry of shocks was pointed out as a factor

for optimal currency area (Bayoumi and Eichengreen (1993)). It is possible to form an optimal currency area because it is unnecessary to make intra-regional adjustments in a region where symmetric shocks happen. Symmetry of supply shocks is focused on because supply shocks have long run effects on GDP while demand shocks have no long run effects on GDP in a situation where the natural unemployment hypothesis holds. The supply shocks mean ones that have effects on production function like productivity shocks and oil price shocks.

Bayoumi, Eichengreen, and Mauro (2000) made an empirical analysis on an optimal currency area in East Asian region<sup>3</sup>. Their results show that correlations are relatively higher among Malaysia, Indonesia, and Singapore. Also, a correlation is higher between Singapore and Thailand. Therefore, these ASEAN four countries might be able to form an optimal currency area. Moreover, supply shocks in Japan has a positive correlation with Taiwan, Korea, and Australia. On one hand, it has lower correlation with ASEAN countries except for Thailand.

#### **An empirical analysis of optimal currency area for East Asia**

We further extended earlier works of Kawasaki (2000) and Ogawa and Kawasaki (2001) in order to analyze empirically an optimum currency area for East Asia. In this paper, we also use a Generalized Purchasing Power Parity (G-PPP) model to conduct the empirical analysis as well as in earlier works. Now we use a common currency basket as well as the US dollar as an anchor currency. We defined the common currency basket as one that is composed of three major currencies: the US dollar, the Deutsche mark, and the Japanese yen. We supposed that each of the three currencies had same weights in the currency basket.

The G-PPP model is extended from a simple PPP model by taking into account difficulties in holding PPP because frequently occurred nominal and real shocks continuously have effects on macro fundamentals. Even in the long run, changes in a bilateral exchange rate depend not only on changes in relative prices between the related two countries but also on those in relative prices among the two countries and other countries. Price levels in other countries may have effects on domestic price levels in the two countries because prices of intermediate goods imported from abroad may have effects on prices of domestic products. Therefore, it is assumed in the G-PPP model that there are common factors among some bilateral real exchange rates of the home

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<sup>3</sup> Sato, Zhang, and McAleer (2001) used a similar structural VAR method to investigate an optimal currency area for East Asia.

currency vis-à-vis currencies of foreign countries with which the home country has strong economic relationships. Thus, the real exchange rates have stable equilibrium in the long run if they have strong economic relationships with each other.

The G-PPP model explains that a PPP holds if a linear combination of some bilateral real exchange rate series has equilibrium in the long run, even though each of the bilateral rate series is nonstationary. Therefore, we investigate such stable linear combinations in the long run composed with some bilateral real exchange rate series based on the cointegration analysis of Johansen and Juselius (1990). Using this econometric method, we can find the optimal members in the common currency area.

### (1) Data

Our sample period in the empirical tests for G-PPP model covers from October 1985 to June 1997. Our sample countries are seven East Asian countries which include Korea, Singapore, Malaysia, Thailand, the Philippines, Indonesia, and China. Real exchange rates were based on monthly data of nominal exchange rates and consumer price index of the related countries.<sup>4</sup> The rest of data are from IMF, *International Financial Statistics* (CD-ROM).

### (2) Anchor currencies and common currency areas

We regarded either the US dollar or the common currency basket that was composed of the US dollar, the Deutsche mark, and the Japanese yen as an anchor currency. Since we supposed that each of three major currencies had same weights in the currency basket, the real exchange rate between each of the seven East Asian currencies and the currency basket could be defined as follows,

$$re_{i,CB} = (re_{i,US})^{(1/3)} \cdot (re_{i,JP})^{(1/3)} \cdot (re_{i,DM})^{(1/3)}. \quad (1)$$

We analyzed which of the seven East Asian countries (Korea, Singapore, Malaysia, Thailand the Philippines Indonesia, and China) can form a common currency area with either the currency basket or the US dollar as an anchor currency. In this paper, we focused on the cases in which more than two countries are included in the linear combinations, therefore, each combination consisted of three, four, five, six, or seven countries was examined as an optimal currency area. Then, we conducted “Johansen test” for 198 possible linear combinations. Since the G-PPP model is assumed that all

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<sup>4</sup> Although Enders and Hurn (1994) used the wholesale price index to calculate the real exchange rate, we use the consumer price index because we assume two commodities which include the tradable and the non-tradable goods. See Kawasaki (2002) for details of the theoretical background.

real exchange rates in a common currency area must be nonstationary, we conducted the unit root tests: Augmented Dickey-Fuller (ADF) test, and Kwaiatkowski, Phillips, and Shmidt and Shin (KPSS) type unit root test, for each real exchange rate series, and confirmed all series have a unit root.

### (3) Cointegration analysis

We used the Johansen method (Johansen and Juselius (1990)) to test whether a long run relationship can exist in the vector auto regressive model (VAR). In the case that there is a long run relationship in the VAR model, we can recognize that variables in the model are cointegrated, and that equilibrium errors from the long run relationship must be corrected in the long run. Assuming that variables in the model are cointegrated, we can rewrite the VAR model as the error correction model (ECM) as follows:

$$\Delta R_t = \sum_{l=1}^{k-1} \Gamma_l \Delta R_{t-l} + \Pi R_{t-1} + \varepsilon_t, \quad \Pi = \alpha \cdot \beta' \quad (2)$$

We tested whether products of nonstationary vector  $R_t$  and matrix  $\Pi$ , which contained cointegration vector, were stationary or not fewer than 5% of significance level.

It points out the robustness problems in conducting the Johansen test. One problem is related with choice of the lag length in VAR or ECM. It is the usual way to choose the lag length of VAR model or ECM according to the fitting criteria, e.g. Schwartz information criterion or others. It is true that these criteria are useful but may not indicate the number of lag-order to choose uniquely. Unfortunately, two models with different lag length bring us different results. It means that we may have two opposite implications for our investigations. Another problem in conducting the cointegration analysis is related with difficulties in identifying the proper rank of matrix  $\Pi$  and the appropriate equilibrium in the matrix  $\beta$ . When the Johansen test indicates the possibilities of the several cointegration vectors in the matrix  $\beta$ , which means that the number of the ranks  $r$  of matrix  $\Pi$  can be more than one, we may face the identification problem to choose the long run equilibrium.

In our empirical test, it is also important to investigate which error correction model with lags is fitter for the data generating processes and can bring each variable into appropriate long run equilibrium. Therefore, our attempts to improve the robustness were to carefully conduct the Johansen test with additional 8 tests as follows.

Firstly, we assumed the maxim lag-effect of the data generating process was 12 lags

and conducted the Johansen test for each model containing from 2 lags to 12 lags. Here we varied the sample period to equalize the degree of freedom in each of the 12 models. Secondly, we calculated the statistics of two information criteria: Schwartz information criterion and Hannan-Queen information criterion. Thirdly, we conducted the three kinds of tests for autocorrelations in the residuals of the ECM: Ljung-Box test on the estimated auto- and cross-correlations, LM-type test for the first and fourth order autocorrelations. These calculations and test statistics help us to choose lag order properly. At the fourth step, we conducted the additional three chi-square-based tests for each alpha or beta in matrix  $\Pi$  to avoid identification problems about the appropriate equilibrium. The first chi-square-based test will show whether each variable is excluded from the vector. The second one is to test whether the individual series are stationary by themselves. The last one is to test whether each variable can be considered weak exogenous or not. These three tests will be helpful for us not only to identify the long run equilibrium but also to choose proper lag length in the ECM. If we choose proper lag-order of the ECM, the null hypothesis of the second test must be rejected. If the second test shows the acceptance of null hypothesis of stationarity, it conflicts with the fact that each variable has unit root since we had already confirmed the nonstationarity of each variable with two kind of unit-root test. Therefore, the second test would help us to choose proper lag length in ECM. The other two tests also help to indicate the possibility of over-identification or under-identification. The first test will show the lack of needed variables in the model. Third one can indicate the existence of extra variables if we wrongly increase lag-order of the model.

In our arbitrary strategy improving the robustness, the point is that we should choose a lag length by taking into account whether the equilibrium of that model is adequate for the cointegration relationship or not. In other words, we investigated models that have an appropriate equilibrium in the data, and compared with the fitness of those models about lag-order. Our first step to choose ECM with proper lag order and appropriate long-run equilibrium is that we select the cases in which the assumption of no serial correlation about residuals holds. Next step is that we select the cases in which the chi-square-based tests show significance in the alternative hypothesis of the long-run exclusion, stationarity, and weak exogeneity. Final step is to make a comparison among all possible models in two information criterions. When we had more than two different results, we should compare the information criteria. Following these steps, we could uniquely define each ECM that included proper lag-order and appropriate equilibrium. We showed details of our strategy to define the unique model in the Appendix.



Table 1 shows maximum ranks, two kinds of information criteria, and three tests for residuals for each ECM from 2 to 12 lags. From the results of the Table 1, we could select a few or more cases from each set. Combining the results of the three chi-squared-tests for residual, we can find the most appropriate long-run equilibrium and lag-order from those cases. Then we conducted the three chi-square-based tests for each alpha or beta in matrix  $\Pi$ . We carefully chose the optimal error correction model with lags according to our strategy.

Next, Table 2 shows the result of Johansen test;  $\lambda$ -trace and  $\lambda$ -max tests after selecting the correct lag-order of all ECM. We had several cointegration relationships: 58 combinations for the US dollar as an anchor currency and 46 combinations for the common currency basket as an anchor currency.

Table 3 shows the result of three chi-square-based test identified as the optimal model. Here, we should only focus on the combinations in which all countries in a liner combination have significant results on those three tests, because we need to specify the minimal combination of currency area including all of the seven East Asian countries.

### **Empirical Results**

For the US dollar, we could find only one combination in which all countries in a liner combination showed significant results on the three tests. This combination includes Singapore, Malaysia, Thailand, and Indonesia in the currency area (US409). For the common currency basket, we could find 9 combinations in which all countries in a liner combination showed significant results on the three tests. 4 of the 9 combinations include three East Asian countries in the currency area, Singapore, Thailand, and Indonesia (CB313), Singapore, Malaysia, and Thailand (CB315), Singapore, Thailand, and China (CB324), and Korea, Singapore, and China (CB335). The other 5 combinations include four East Asian countries in the currency area; Korea, Malaysia, the Philippines, and Indonesia (CB404), Korea, Singapore, Thailand, and Indonesia (CB406), Korea, Malaysia, Indonesia, and China (CB418), Korea, Singapore, Thailand, and China (CB426), and Singapore, Thailand, Indonesia, and China (CB428).

Our empirical results showed three features in comparing the US dollar with the currency basket as an anchor currency. First, while the common currency area evaluated by the US dollar as an anchor currency has only one combination, the common currency area evaluated by the currency basket as an anchor currency has several varieties of combinations. Second, some ASEAN countries can form a common currency area together with Korea or China with the currency basket as an anchor

currency while the common currency area with the US dollar as an anchor currency is limited to the four ASEAN countries. Third, for the currency basket as an anchor currency, we could find two different groups, whose countries include all of the East Asian countries but are not overlapped each other; the combination of Korea, Malaysia, the Philippines, and Indonesia (CB404) and the combination of Singapore, Thailand, and China (CB324). We could not find the two groups when we test possibility of the common currency area by the US dollar as an anchor currency. From these features, our empirical results suggest that the common currency basket is more applicable for an anchor currency than the US dollar when East Asian countries form a common currency area in the region.

### **Policy implications**

Among the findings, the third one implies that the two non-overlapping groups will be able to form a larger common currency area by their inter-group policy coordination. Eventually, adjustment speeds toward the long run equilibrium are different between the two groups while the two groups can share the same basket weights. The equilibrium defined by our G-PPP model can be interpreted as the balance of payments equilibrium for a total of the common currency area countries. If the two groups have different adjustment speeds toward the long run equilibrium, there is a possibility that one group may run current account surplus in total while the other may run current account deficit in total during the adjustment process toward the long run equilibrium. Our empirical results suggested that the combination which includes all the seven countries could not be stable in the long run while the two non-overlapping combinations had cointegration relationships when both of the two combinations used the common currency basket as an anchor currency. It means that each of the two groups will be able to create a different common currency area by using a common currency basket and the same basket weights at the same time. However, in the adjustment process toward the long run equilibrium the two groups may face a currency account deficit or surplus. In this case, governments included in the two common currency area need to make a policy coordination between the two groups, that is called an “inter-group policy coordination”. We suggest that the key feature of the “inter-group policy coordination” is to employ macroeconomic policies including fiscal policy or fiscal transfers to adjust the transitional asymmetry in the balance of payment between two groups during adjustment process. In addition to the inter-group policy coordination, we can suggest that deepening of the financial integration or structural economic

integration in East Asia may help to equalize the different adjustment speeds between the two groups.

### **Conclusion**

This paper suggested that it is necessary to create a common currency basket in order to resolve coordination failure in choosing desirable exchange rate system for East Asian countries. From this point of view, it is natural that a future regional currency arrangement in East Asia should be related with a common currency basket. The European experiences of the ECU should provide us with useful information in considering a common currency unit in East Asia. In the case of East Asian countries, we have international trade relationship with variety of regions that include the intra-region, Japan, the United States, and European countries. Therefore, a possible common currency unit in East Asia would consist of the US dollar, the Japanese yen, and the euro and so on. It is contrast with the ECU case where the ECU consisted of intra-regional currencies.

We used the Generalized Purchasing Power Parity (G-PPP) model to investigate possibilities of a common currency area for some of East Asian countries in terms of a long-run stable linear combination among some regional currencies. The analytical results imply that the ASEAN5 countries, China, and Korea will be candidates for a common currency area with a common currency basket as an anchor currency. Also, we have a conclusion that a common currency basket is more applicable for an anchor currency than the US dollar in forming a common currency area in the region.

However, it may be questionable to establish a currency union in East Asian region in the near future. We can point out that possibilities of regional policy coordination depend on consensus of policy objectives among the governments of East Asian countries. Needless to say, the monetary authorities have to intend to make regional policy coordination as a premise that they create a common currency area. It is difficult for them to make regional policy coordination unless they have common policy objectives. Especially, it is important that they have common objectives in monetary and exchange rate policies in order to create a common currency area.

### **Appendix:**

The cointegration analysis is a very useful tool to investigate the dynamic path of the multiple economic variables. However, it is susceptible (subject) to criticism

regarding the robustness of the test results. Namely, the number of cointegration relationships (the cointegration rank) sometimes varies with the lag order of the underlying vector-autoregressive model. If the rank condition is variable, we have a lot of possibilities to identify equilibrium among variables. That is, two issues: whether or not the long run relationship among variables can be present in the data and which equilibrium has more important implication for economics, depend on our choice of the lag order. Therefore, we need to carefully identify the appropriate error correction model before conducting the Johansen test.

In this paper, we provisionally introduce additional 8 tests into Johansen cointegration analysis to solve “the dilemma” problem. The point is that we choose the lag order of error correction model considering the appropriate equilibriums and elements in matrix  $\Pi$ . In other words, we first investigate an appropriate equilibrium of those variables, and test whether that equilibrium and the resultant error correction model satisfy the several assumptions of the Johansen test. Our assumptions are that (1) there is no serial correlation in residuals of the VAR models, (2) each variable could be included in the long run relationship, (3) each variable is nonstationary, and (4) each variable is an endogenous variable in their relationship. If we could find the true data generating process between variables, and it has a long run equilibrium to converge, that model must fulfill all our assumptions of the cointegration analysis. In the case that there is no equilibrium that meets our assumptions, we can recognize that there is no long-run relationship at all between variables, and the cointegration rank must be zero. Depending upon the lag order, we may encounter conflicting results: one result is that there is at least one cointegration and the other is that there is no cointegration, but in both instances the assumptions of the Johansen procedure are satisfied. To choose between the two, we examine the fitness of the alternative models by applying the conventional information criteria. Our empirical strategy is as follows.

Prior to cointegration analysis, we have to confirm whether or not each variable has a unit root and is nonstationary. In some cases, stationary series can be included in cointegration relationship or error correction model. But in our G-PPP model, we assume all variables to be nonstationary.

(Step 1) We conduct the Johansen test for VAR models. Here, we conduct the tests for the 11 sets of error correction model with lag order from 2 to 12 per one linear combination of variables and varied the sample period to equalize the degree of freedom in each of the 12 models. We assume that maximum lag order effecting on the equilibrium is 12 in the true data generating process. This assumption can easily be changed.

(Step 2) Next, we calculate three test statistics for residuals: multivariate Ljung-Box test based on the estimated auto- and cross-correlations of the first quarter number of lags of all sample periods, Lagrange-Multiplier type tests for first and fourth order autocorrelations. The residuals of VAR or error correction model are assumed to have no serial correlation. Therefore, we exclude the cases where the assumption is not met regardless of whether cointegration rank is zero or not.

Here, we gather the cases which validate the assumption of no serial correlations in residuals. We can divide those models into a group of no cointegration rank and that of more than one. If there are some cases that cointegration rank is more than one, which means there are more equilibria between variables, we have to conduct the further tests for these cases.

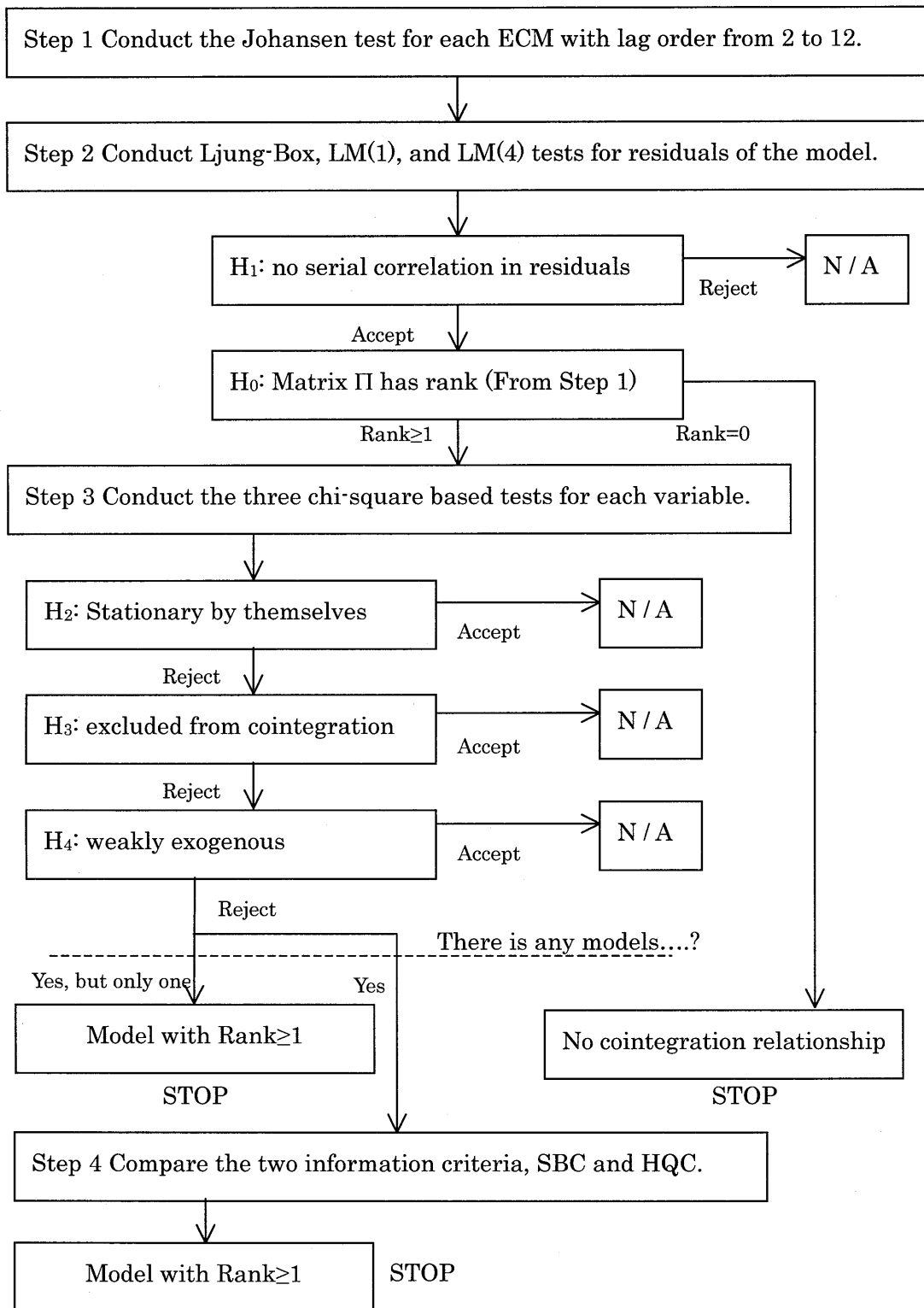
(Step 3) We conduct three kinds of chi-square-based tests for the cases which have equilibrium. Usually, these tests are used for identifying the equilibrium. We use these tests not only to identify the equilibrium but also to choose a proper lag order. The first test is to find variables that can be excluded from the long run relationship in the cointegrating vector  $R$ . The null hypothesis in this test is  $\beta_{ij} = 0$ . If the null is accepted and the test statistic is asymptotically distributed as chi-square with  $r$  degrees of freedom, it might mean the possibilities that some relevant variables are missing from the cointegration relationship. In the case of strong multicollinearity, we will also get an insignificant test value. The second test is about stationarity. This test is to check whether the individual series can be stationary by themselves. The null is  $\beta = (H, \varphi)$ . If the null is accepted and the test statistic is asymptotically distributed as chi-square with  $r$  degrees of freedom, it might mean the possibility that the variable will be excluded from the cointegration relationship; therefore we can identify the minimal set of variables that comprise the long-run equilibrium relationship. The last is to test whether any of the elements in the vector  $R$  can be considered as weakly exogenous for the long run equilibrium. The null hypothesis is  $\alpha_{ij} = 0$ . In the case of accepting the null and asymptotically distributed as chi-square with  $r$  degrees of freedom, that variable might be a weakly exogenous series for the long run equilibrium, therefore, we can exclude such cases.

If all three tests are passed here, we can find the minimum set of variables in the long-run equilibrium. Therefore, for most cases, we can identify optimal error correction model with proper lags and appropriate equilibrium to converge. We can call this the "Best fitting model". If we cannot find any cases which satisfy the three tests, we should focus on the second best case. We regard the second best cases to be those which meet the stationarity test, but fail to pass the other two tests. We should not jump to a

conclusion of no linear long-run equilibrium. The first and third tests are very helpful for us because these tests can detect the possibilities of over-identification or under-identification of model not only for the minimum set of variables but also for the proper lag length. When we wrongly increase the lag length or erroneously determine the rank, test statistics suddenly show the possibilities of accepting the null. On the other hand, we may be able to find some other exogenous variables to form a long-run equilibrium relationship as an exogenous variable. Therefore, we have to carefully look into a second best. Here, we only focus on the cases in which at least two variables in the vector can be rejected the null of long-run exclusion and weak exogeneity because it is not important to think that only one endogenous variable with several exogenous variables can converge to long run equilibrium in a common currency area or G-PPP model.

(Step 4) We compare all possible models in terms of the fitness of true data generating process. This step is helpful to avoid the arbitrariness to choose a model in final step. In step 3, we may not be able to find the best case and may have to look for second best cases. It is true that the first test and the third one indicate the possibility of over- or under-identification of model, but we cannot fully identify it. It means that we cannot recognize whether or not that model is more suitable than other. Therefore, in the final step, we use information criterion to choose proper or fitting model for data generating process. According to these steps, we can identify the unique model and equilibrium.

§Choosing the lag order of ECM.



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Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis:p-value

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12			
CB301	SBC	-26.30655	-26.02211	-25.57842	-25.26353	-25.08328	-24.83925	-24.57909	-22.0531	-21.65163	-21.33884	-21.20089			
	HQC	-26.56769	-26.40715	-25.08327	-25.88431	-25.8164	-25.68124	-25.25267	-23.10326	-22.8014	-22.54169	-22.54169			
	LB	200.08	187.065	190.079	180.146	187.338	200.082	206.51	226.51	195.316	0.71	213.492	0.36 *		
	LM(4)	10.97	0.28 *	11.929	14.979	0.09 *	4.641	0.86 *	15.932	0.07 *	9.056	0.43 *	2.555	0.98	
CB302	Rank(s)	7.857	0.55 *	7.588	5.58 *	4.526	0.87 *	3.031	0.96 *	10.378	11.722	0.23 *	12.255	0.20 *	
	SBC	-25.55626	-25.28464	-24.8782	-24.60523	-24.36921	-24.1283	-23.91562	-23.74029	-23.46218	-23.19451	-23.07647	-23.07647		
	HQC	-25.81714	-25.67168	-25.38417	-25.22604	-25.10333	-24.9703	-24.86323	-24.79044	-24.61195	-24.44112	-24.41727	-24.41727		
	LB	235.768	227.382	220.555	210.466	0.75 *	210.856	0.59 *	234.928	0.19 *	234.959	242.172	0.05	250.457	0.02
CB303	Rank(s)	7.113	0.53 *	8.633	4.023	5.573	0.78 *	7.413	0.59 *	13.112	10.465	0.31 *	3.248	0.95	
	SBC	-25.32782	-25.32782	-25.00626	-24.71327	-24.53875	-24.28897	-23.90993	-21.49685	-21.12585	-20.91282	-20.79031	-20.79031		
	HQC	-25.80719	-25.71286	-25.51111	-25.33408	-25.27187	-25.13097	-24.85755	-22.547	-22.27562	-22.15942	-22.13111	-22.13111		
	LB	210.643	214.735	213.837	196.165	0.92 *	223.28	0.35 *	184.721	0.81 *	188.811	182.937	0.88 *	192.977	0.75 *
CB304	Rank(s)	7.428	0.30 *	6.593	3.689	0.93 *	17.185	0.05 *	18.723	0.03 *	20.405	10.866	0.28 *	3.714	0.93 *
	SBC	-25.94663	-25.73952	-25.51406	-24.99124	-24.74793	-24.45813	-24.45813	-22.09733	-21.65077	-21.36593	-21.26593	-21.26593		
	HQC	-26.20777	-26.12456	-26.01891	-25.81608	-25.72436	-25.58993	-25.40574	-23.14748	-22.80054	-22.61254	-22.57685	-22.57685		
	LB	240.703	234.395	236.064	227.557	0.44 *	225.055	0.32 *	204.643	0.79 *	187.671	190.636	0.79 *	201.698	0.59 *
CB305	Rank(s)	8.186	0.32 *	6.888	4.068	0.91 *	4.023	0.91 *	28.703	0.00	27.343	10.643	0.30 *	7.646	0.57 *
	SBC	-24.10544	-23.69557	-23.42002	-23.20206	-23.11943	-22.96544	-22.7242	-22.61406	-22.33773	-22.33773	-21.74346	-21.74346		
	HQC	-24.64476	-24.49048	-24.20042	-23.93518	-23.80743	-23.67004	-23.67004	-23.60067	-23.4875	-23.10509	-23.08425	-23.08425		
	LB	246.407	230.886	235.698	228.101	0.43 *	228.313	0.27 *	243.499	0.10 *	232.963	242.525	0.05	245.471	0.03
CB306	Rank(s)	6.365	0.68 *	6.073	7.982	0.54 *	5.739	0.81 *	8.382	0.50 *	6.022	11.565	0.23 *	3.093	0.96
	SBC	-24.05496	-23.99499	-23.3188	-23.11943	-22.92827	-22.92827	-22.61406	-20.54657	-20.20887	-19.70572	-19.55851	-19.55851		
	HQC	-24.54664	-24.09984	-23.9996	-23.84655	-23.77026	-23.56107	-23.56107	-23.56107	-23.56107	-23.56107	-20.95233	-20.95233		
	LB	206.623	200.741	212.345	205.357	0.82 *	204.238	0.71 *	230.753	0.23 *	228.973	199.903	0.63 *	195.168	0.71 *
CB307	Rank(s)	6.663	0.67 *	6.232	6.384	0.68 *	7.154	0.62 *	8.873	0.45 *	6.213	3.842	0.92 *	2.618	0.98
	SBC	-24.61745	-24.39956	-24.09557	-23.84373	-23.57182	-23.35482	-23.12704	-21.07939	-20.61565	-20.14379	-20.00394	-20.00394		
	HQC	-24.78484	-24.60042	-24.46453	-24.46453	-24.34093	-24.19682	-24.07466	-23.782	-23.782	-23.90399	-23.44473	-23.44473		
	LB	242.708	239.542	230.58	245.614	0.16 *	236.276	0.16 *	238.439	0.03 *	220.841	185.383	0.86 *	201.749	0.59 *
CB308	Rank(s)	8.857	0.45 *	7.39	5.512	0.79 *	6.148	0.73 *	5.494	0.79 *	8.799	4.26	0.89 *	2.894	0.97
	SBC	-23.57923	-23.44844	-23.03816	-22.82953	-22.64258	-22.49226	-22.33675	-22.06888	-21.86145	-21.30828	-21.16322	-21.16322		
	HQC	-23.84037	-23.83348	-23.54301	-23.45033	-23.33426	-23.322	-23.28436	-23.11903	-23.01122	-22.55488	-22.50402	-22.50402		
	LB	248.546	241.701	238.111	235.03	0.21 *	232.667	0.21 *	243.677	0.08 *	249.745	200.075	0.62 *	194.158	0.73 *
CB309	Rank(s)	8.419	0.49 *	8.491	12.212	0.20 *	10.512	0.31 *	7.989	0.54 *	11.311	4.832	0.85 *	22.602	0.01
	SBC	-24.17739	-23.86726	-23.55699	-23.33771	-23.16992	-22.93875	-22.78752	-22.66301	-22.39038	-21.94188	-21.77594	-21.77594		
	HQC	-24.43853	-24.2523	-24.06154	-23.9979	-23.90304	-23.78075	-23.73334	-23.71317	-23.54015	-23.18848	-23.11674	-23.11674		
	LB	216.352	227.34	223.013	224.741	0.49 *	228.287	0.27 *	247.467	0.07 *	232.422	238.251	0.07 *	247.142	0.03
CB310	Rank(s)	13.479	0.14 *	11.119	14.228	0.11 *	8.522	0.50 *	11.538	0.25 *	13.453	6.318	0.71 *	10.079	0.34 *
	SBC	-24.00857	-23.83301	-23.7084	-23.33423	-23.10969	-22.96425	-22.64279	-20.68321	-20.25425	-19.68834	-19.52544	-19.52544		
	HQC	-24.26971	-24.21805	-24.07569	-23.95504	-23.84281	-23.80625	-23.59045	-23.17336	-21.40402	-20.93495	-20.86624	-20.86624		
	LB	252.222	250.834	249.673	248.166	0.14 *	242.504	0.10 *	268.42	0.01 *	257.162	187.533	0.83 *	184.966	0.86 *
CB311	Rank(s)	8.709	0.46 *	8.584	9.332	0.42 *	8.703	0.48 *	8.703	0.46 *	11.83	12.053	0.21 *	19.954	0.02
	SBC	-24.00857	-23.83301	-23.7084	-23.33423	-23.10969	-22.96425	-22.64279	-20.68321	-20.25425	-19.68834	-19.52544	-19.52544		
	HQC	-24.26971	-24.21805	-24.07569	-23.95504	-23.84281	-23.80625	-23.59045	-23.17336	-21.40402	-20.93495	-20.86624	-20.86624		
	LB	252.222	250.834	249.673	248.166	0.14 *	242.504	0.10 *	268.42	0.01 *	257.162	187.533	0.83 *	184.966	0.86 *

\*: .5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p-value (Continued: 1)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	lags13	lags14	
CB311	SBC	-26.86311	-26.61585	-26.2211	-25.92953	-25.7919	-25.7732	-25.34649	-25.17326	-24.82226	-24.53396	-24.29211			
	HQC	-27.12425	-26.72955	-26.22955	-26.55034	-26.23202	-26.1932	-26.29611	-26.22342	-23.0004	-23.57203	-23.67291			
	LB	234.589	236.387	0.29	0.46	0.46	0.22	0.22	0.14	0.12	0.12	0.09	0.09	0.06	0.06
	LM(1)	4.605	5.279	0.81	1.4897	0.10	12.727	0.18	5.996	0.76	7.16	13.018	0.16	8.702	0.47
CB312	Rank(s)	9.479	0.39	5.884	0.75	5.198	0.82	8.695	0.47	4.514	0.87	7.641	0.57	19.123	
	SBC	-26.99343	-26.66916	-26.22132	-25.95099	-25.86946	-25.58099	-25.19396	-25.32828	-22.19736	-21.9262	-21.67796			
	HQC	-27.10542	-26.72637	-26.22637	-26.57177	-26.25029	-26.22298	-26.14157	-26.24157	-23.34728	-23.07878	-23.01876			
	LB	220.627	238.789	0.25	0.25	0.25	0.22	0.22	0.09	0.83	196.01	0.70	196.362	0.09	
CB313	Rank(s)	10.712	0.30	13.141	0.16	21.014	0.01	12.467	0.19	28.099	0.00	7.133	0.62	7.333	
	SBC	-27.3033	-27.03926	-26.75471	-26.45495	-26.36467	-26.0982	-25.77958	-23.17084	-22.70242	-22.37759	-22.10962			
	HQC	-27.56444	-27.12425	-26.72955	-26.9402	-26.9402	-26.9402	-26.7272	-24.221	-23.85218	-23.5218	-23.45042			
	LB	253.121	0.10	240.789	0.22	238.832	0.25	240.873	0.12	246.715	0.07	223.65	0.20	225.481	
CB314	Rank(s)	5.496	0.79	12.808	0.17	19.894	0.02	6.873	0.65	5.292	0.81	18.073	0.23	13.628	
	SBC	-26.06064	-25.82489	-25.44157	-25.20344	-25.01021	-24.79024	-24.5573	-24.32118	-24.06537	-23.81763	-23.62466			
	HQC	-26.32178	-26.20993	-25.94642	-25.82424	-25.74333	-25.63223	-25.50492	-25.37134	-25.21514	-25.06423	-24.96545			
	LB	230.082	0.39	230.903	0.38	224.312	0.50	209.856	0.60	216.42	0.48	243.135	0.05	245.763	
CB315	Rank(s)	18.411	0.03	5.227	0.81	11.733	0.23	11.432	0.25	7.064	0.63	7.085	0.52	3.945	
	SBC	-26.50662	-26.32663	-26.02684	-25.77954	-25.63794	-25.40343	-25.18795	-24.98969	-24.66407	-24.45486	-24.08122			
	HQC	-26.32178	-26.20993	-25.94642	-25.82424	-25.74333	-25.63223	-25.50492	-25.37134	-25.21514	-25.06423	-24.96545			
	LB	242.951	0.20	225.977	0.47	233.299	0.52	224.105	0.34	224.912	0.32	233.523	0.21	238.658	
CB316	Rank(s)	8.151	0.52	11.102	0.27	16.089	0.07	11.122	0.22	11.922	0.22	13.133	0.01	9.48	
	SBC	-26.49204	-26.30568	-26.02293	-25.73229	-25.69648	-25.42356	-25.11278	-24.92444	-22.20025	-21.92444	-21.6611			
	HQC	-26.5318	-26.69072	-26.52778	-26.37309	-26.42926	-26.26755	-26.06039	-26.03984	-23.35001	-23.17104	-23.0019			
	LB	254.687	0.08	252.831	0.10	247.507	0.14	243.937	0.09	229.877	0.25	216.192	0.48	190.219	
CB317	Rank(s)	14.912	0.09	10.821	0.29	14.419	0.11	12.156	0.21	11.881	0.22	10.799	0.29	16.589	
	SBC	-24.7656	-24.43655	-24.0503	-23.86486	-23.6728	-23.43015	-23.21492	-23.02653	-22.83807	-22.7352	-22.1811			
	HQC	-25.02474	-24.82159	-24.55515	-24.48567	-24.40592	-24.27215	-24.16253	-24.07669	-23.98784	-23.6218	-23.52191			
	LB	212.631	0.71	222.019	0.54	220.714	0.57	208.195	0.64	221.363	0.39	245.774	0.03	230.969	
CB318	Rank(s)	5.651	0.77	3.144	0.96	14.297	0.11	8.206	0.51	5.559	0.78	10.056	0.35	3.322	
	SBC	-25.16452	-24.90227	-24.588	-24.37509	-24.20485	-23.97791	-23.73429	-23.59514	-23.21161	-22.85211	-22.64696			
	HQC	-25.42566	-25.28731	-25.09285	-24.9959	-24.81991	-24.64529	-24.68191	-24.64529	-24.36138	-24.09871	-23.98776			
	LB	256.845	0.07	255.464	0.08	236.752	0.28	247.243	0.15	229.693	0.25	242.808	0.04	252.812	
CB319	Rank(s)	12.862	0.17	8.899	0.45	8.899	0.45	6.387	0.70	2.776	0.97	12.018	0.21	12.499	
	SBC	-25.18532	-24.96748	-24.63942	-24.39427	-24.30467	-24.06781	-23.76789	-21.39938	-20.9857	-20.43327	-20.27732			
	HQC	-25.41946	-25.35252	-25.14427	-25.01507	-24.90908	-24.7155	-24.64958	-24.584	-22.13547	-21.68812	-21.58776			
	LB	267.921	0.03	268.038	0.03	269.062	0.02	265.075	0.01	259.283	0.02	245.728	0.03	198.337	
CB320	Rank(s)	9.111	0.43	8.782	0.46	15.394	0.08	13.537	0.14	7.697	0.36	5.263	0.81	7.97	
	SBC	-24.50918	-24.32937	-24.00059	-23.8152	-23.69505	-23.49339	-23.35779	-23.35779	-22.8869	-22.39925	-22.18644			
	HQC	-24.77032	-24.71441	-24.50544	-24.42817	-24.43538	-24.43538	-24.3054	-24.3054	-24.03667	-24.03667	-23.52724			
	LB	176.123	0.01	281.565	0.01	279.86	0.00	275.777	0.00	275.777	0.00	267.042	0.00	230.1	
CB321	Rank(s)	13.782	0.13	6.605	0.68	17.172	0.04	15.464	0.08	17.816	0.04	18.733	0.03	17.595	
	SBC	-24.9632	-24.733	-24.504	-24.346	-24.2712	-24.1017	-23.948	-23.845	-22.465	-22.195	-21.999			
	HQC	-25.16452	-24.96748	-24.63942	-24.39427	-24.30467	-24.06781	-23.76789	-21.39938	-20.9857	-20.43327	-20.27732			
	LB	9.652	0.38	10.346	0.32	8.733	0.46	8.733	0.46	11.012	0.27	11.012	0.27	9.448	

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criterions, and Residual Analysis:p- value (Continued: 2)

Combination	Rank(k)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12+1	lags12+2	
CB321	SBC	-22.49831	-22.22644	-21.90318	-21.76286	-21.59011	-21.36028	-21.16177	-20.84794	-20.69701	-20.22323	-20.06208		
	HO	-22.75945	-22.61148	-22.40683	-22.33636	-22.33233	-22.20227	-21.89881	-21.46478	-21.46478	-21.46983	-21.40288		
	LB	4.4773	231.883	0.11	238.199	0.06	249.751	0.12	258.199	0.02	255.889	0.01	229.081	0.14
	LM(1)	0.88	4.081	0.91	17.656	0.04	8.392	0.50	3.669	0.93	12.291	0.20	9.943	0.56
CB322	Rank(k)	16.446	14.193	13.083	4.33	7.653	0.57	13.049	13.294	15.736	12.84	13.141	0.16	
	SBC	-23.98545	-23.75795	-23.46034	-23.27388	-23.14367	-22.99096	-22.81779	-22.37368	-22.10162	-21.78561	-21.53253		
	HO	-24.04639	-23.95652	-23.89468	-23.87968	-23.87679	-23.74295	-23.62941	-23.42384	-23.25139	-23.03221	-22.87333		
	LB	232.397	233.255	239.579	237.488	233.421	241.182	243.269	240.707	242.384	235.022	230.166	0.13	
CB323	Rank(k)	9.25	8.522	8.983	11.493	8.993	5.868	9.884	8.828	10.809	8.061	8.431	0.49	
	SBC	-24.4174	-24.17463	-23.88316	-23.55116	-23.50716	-23.34024	-22.95417	-22.36065	-19.99594	-19.70458	-19.49866		
	HO	-24.67834	-24.55968	-24.34001	-24.1724	-24.24028	-24.08223	-23.90179	-23.14457	-20.95118	-20.8394	-20.8394		
	LB	224.346	224.361	239.577	229.845	235.035	242.865	242.865	188.202	176.786	176.783	182.225	0.89	
CB324	Rank(k)	7.205	5.311	5.144	5.344	6.27	6.356	6.331	21.732	22.745	14.124	7.674	0.57	
	SBC	-24.4724	-24.21872	-23.93141	-23.66685	-23.50556	-23.25464	-22.79274	-22.42124	-22.42124	-22.26605	-21.95524		
	HO	-24.73388	-24.60376	-24.43626	-24.28765	-24.23868	-24.05664	-24.01573	-23.84289	-23.57101	-23.51265	-23.29604		
	LB	199.503	203.899	202.455	216.556	202.698	199.114	206.908	217.037	214.163	225.241	245.631	0.04	
CB325	Rank(k)	9.192	7.84	7.12	4.302	4.648	13.31	11.439	17.267	12.827	9.118	18.065	0.03	
	SBC	-24.03942	-23.66255	-23.29245	-23.08209	-22.87697	-22.62836	-22.41453	-22.09609	-21.90285	-21.67961	-21.44481		
	HO	-24.30036	-24.04759	-23.8003	-23.70289	-23.61009	-23.47056	-23.36215	-23.14625	-23.05262	-22.92621	-22.78561		
	LB	177.226	193.919	205.834	212.455	199.201	200.195	199.114	199.412	199.412	213.845	232.79	0.11	
CB326	Rank(k)	21.80213	-21.87361	-21.79708	-21.74229	-21.71747	-21.57114	-20.5382	-20.20986	-19.94474	-19.42905	-19.30337		
	SBC	-21.80213	-21.87361	-21.79708	-21.74229	-21.71747	-21.57114	-20.5382	-20.20986	-19.94474	-19.42905	-19.30337		
	HO	-22.63237	-22.49361	-22.35382	-22.21308	-22.07234	-21.93160	-21.79086	-21.65012	-21.50938	-21.36864	-21.22790		
	LB	224.964	233.75	245.382	237.308	230.383	246.941	261.53	261.53	270.98	284.419	324.534	0.09	
CB327	Rank(k)	8.182	7.66	7.093	7.301	8.260	6.361	6.099	8.764	7.89	4.551	7.831	0.55	
	SBC	-21.93646	-21.67933	-21.40796	-21.1821	-20.97376	-20.78887	-20.54331	-20.38803	-20.20986	-20.03162	-19.85323		
	HO	-22.19776	-22.06437	-21.80291	-21.80291	-21.70888	-21.62286	-21.49093	-21.35900	-21.22707	-21.09514	-20.96321		
	LB	232.45	234.212	246.47	242.74	245.996	265.253	265.253	266.353	266.353	246.7	193.829	0.74	
CB328	Rank(k)	6.094	7.34	6.80	8.374	7.703	4.017	3.907	15.115	17.13	8.219	9.533	0.39	
	SBC	-21.93596	-21.60886	-21.37983	-21.14627	-20.88846	-20.69681	-20.36491	-20.14414	-19.68739	-19.48739	-19.5622		
	HO	-22.30066	-22.13445	-21.87959	-21.87959	-21.79045	-21.64443	-21.41506	-21.29391	-21.17276	-20.93399	-20.903		
	LB	198.208	201.52	203.699	211.892	216.623	224.224	247.92	239.011	239.011	229.537	229.512	0.14	
CB329	Rank(k)	9.3	8.407	8.607	2.785	3.382	8.272	5.613	14.185	13.233	12.647	9.032	0.43	
	SBC	-22.2892	-21.93596	-21.60886	-21.37983	-21.14627	-20.88846	-20.69681	-20.36491	-20.14414	-19.68739	-19.5622		
	HO	-22.50066	-22.339	-22.11345	-22.00063	-21.87959	-21.79045	-21.64443	-21.41506	-21.29391	-21.17276	-20.93399		
	LB	226.608	227.897	235.677	232.309	231.478	234.002	244.708	242.618	242.618	218.908	212.906	0.37	
CB330	Rank(k)	6.103	6.543	6.454	5.456	6.79	10.142	7.571	6.985	12.591	9.163	10.13	0.34	
	SBC	-21.73804	-21.43148	-21.08876	-20.88766	-20.68847	-20.41203	-20.22697	-19.89323	-19.78853	-19.30814	-19.18303		
	HO	-21.99918	-21.81652	-21.59361	-21.40158	-21.25402	-21.14414	-20.93399	-20.54474	-20.54474	-20.54474	-20.54474		
	LB	226.608	227.897	235.677	232.309	231.478	234.002	244.708	242.618	242.618	218.908	212.906	0.37	

\*: 5% of upper and lower tail



Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p-value (Continued): 4

Combination	Rank(1)	Rank(2)	Rank(3)	Rank(4)	Rank(5)	Rank(6)	Rank(7)	Rank(8)	Rank(9)	Rank(10)	Rank(11)	Rank(12)	
CB406	SBC	-36.18964	-35.69005	-35.23307	-34.75493	-34.37688	-34.00227	-33.22086	-33.54695	-30.26715	-29.65167	-29.20097	
	HQC	-36.68277	-36.41166	-36.19247	-35.90228	-35.72315	-35.59908	-35.26657	-35.11609	-32.3313	-31.87849	-31.59361	
	LB	387.332	0.23	371.543	0.39	375.889	0.38	411.5	0.06	405.626	0.09	413.32	0.05
	LM(1)	11.906	0.75	10.977	0.81	15.693	0.23	20.52	0.20	16.387	0.43	18.454	0.32
CB407	SBC	11.812	0.76	9.776	0.88	11.618	0.77	21.57	0.16	12.004	0.74	27.785	0.01
	HQC	-35.23272	-34.86373	-34.39775	-33.93171	-33.51667	-33.17736	-32.74873	-32.45653	-32.1315	-31.73617	-31.28811	
	LB	401.627	0.12	386.601	0.24	382.569	0.29	397.896	0.14	412.871	0.01	417.48	0.04
	LM(1)	13.393	0.64	15.101	0.52	13.364	0.65	25.191	0.07	16.888	0.39	15.994	0.56
CB408	SBC	-35.36414	-34.96967	-34.51134	-34.04911	-33.68802	-33.32527	-32.8237	-32.30743	-29.51291	-28.9688	-28.46658	
	HQC	-35.69005	-35.33714	-34.96967	-34.51134	-34.04911	-33.68802	-33.32527	-32.8237	-32.30743	-31.73617	-31.28811	
	LB	409.222	0.12	405.213	0.09	421.954	0.08	406.842	0.08	407.454	0.08	417.48	0.04
	LM(1)	18.186	0.31	14.907	0.53	15.364	0.50	28.676	0.03	16.575	0.41	11.053	0.81
CB409	SBC	-35.72476	-35.33683	-34.96389	-34.57559	-34.38561	-34.04771	-33.48876	-33.01376	-30.13639	-29.58831	-29.08077	
	HQC	-36.21789	-35.82845	-35.40328	-35.03225	-34.73188	-34.50853	-34.20838	-33.90889	-32.20054	-31.79513	-31.46436	
	LB	443.671	0.00	407.454	0.08	406.842	0.08	407.454	0.08	406.842	0.08	407.454	0.08
	LM(1)	16.187	0.44	14.907	0.53	17.214	0.37	31.414	0.01	16.323	0.43	11.293	0.79
CB410	SBC	-35.89671	-35.39772	-34.93145	-34.49412	-34.07298	-33.74518	-33.36009	-33.03238	-30.76704	-30.28561	-29.84039	
	HQC	-36.38984	-35.89671	-35.40328	-34.93145	-34.49412	-34.07298	-33.74518	-33.36009	-32.85191	-32.51243	-32.23403	
	LB	399.021	0.13	388.926	0.22	394.555	0.16	402.742	0.10	435.95	0.01	446.868	0.00
	LM(1)	15.975	0.45	8.427	0.94	8.49	0.93	13.648	0.62	12.94	0.68	10.111	0.86
CB411	SBC	-34.01461	-33.51902	-33.03738	-32.63451	-32.15594	-31.85577	-31.39353	-30.93477	-28.25526	-27.58566	-27.21255	
	HQC	-34.50774	-34.24063	-33.99678	-33.78187	-33.59259	-33.339259	-33.11492	-32.83001	-30.31941	-29.81248	-29.59619	
	LB	368.344	0.49	378.488	0.34	398.47	0.13	410.271	0.06	428.815	0.02	440.991	0.01
	LM(1)	13.463	0.64	11.204	0.66	14.206	0.58	18.155	0.31	22.292	0.13	13.736	0.62
CB412	SBC	-34.36484	-33.90176	-33.44978	-32.99813	-32.79833	-32.499	-32.03185	-31.59128	-28.91278	-28.16612	-27.73152	
	HQC	-34.85798	-34.62337	-34.43725	-34.27338	-34.1446	-34.02582	-33.75147	-33.48632	-30.97692	-30.33923	-30.11516	
	LB	451.502	0.00	427.574	0.02	429.918	0.01	449.207	0.00	457.677	0.00	483.938	0.00
	LM(1)	26.159	0.05	14.007	0.60	15.139	0.51	24.142	0.09	14.292	0.58	12.665	0.70
CB413	SBC	-33.10738	-32.76895	-32.28964	-31.87756	-31.39601	-31.15426	-30.84633	-30.43014	-30.17792	-29.63509	-29.31015	
	HQC	-33.60051	-33.49056	-33.22904	-33.02492	-32.74228	-32.69108	-32.45358	-32.24207	-32.24207	-31.86191	-31.69379	
	LB	407.361	0.08	406.67	0.08	430.095	0.01	432.866	0.01	444.04	0.00	436.744	0.01
	LM(1)	13.182	0.66	10.757	0.82	11.204	0.80	18.217	0.31	22.411	0.13	16.2	0.44
CB414	SBC	-33.3519	-33.21785	-33.03738	-32.84518	-32.04974	-31.71986	-31.45663	-31.11291	-30.74366	-30.26522	-29.78317	
	HQC	-34.04503	-33.93946	-33.70318	-33.51884	-33.39601	-33.17625	-33.00814	-32.80781	-32.80781	-32.49204	-32.16681	
	LB	459.922	0.00	456.463	0.01	444.04	0.00	433.999	0.01	446.512	0.00	444.214	0.00
	LM(1)	11.846	0.75	20.005	0.22	11.846	0.75	15.197	0.38	16.302	0.43	12.058	0.74
CB415	SBC	-33.56414	-33.22272	-32.78542	-32.46819	-32.1786	-31.89619	-31.55634	-31.16607	-28.60946	-27.81282	-27.37232	
	HQC	-34.05727	-33.94433	-33.61555	-33.45001	-33.25243	-33.02200	-32.75996	-32.47996	-30.07336	-29.50063	-29.25596	
	LB	455.451	0.00	447.986	0.01	440.134	0.00	432.002	0.00	431.904	0.01	411.617	0.06
	LM(1)	24.156	0.09	16.958	0.39	17.372	0.36	29.081	0.02	24.353	0.08	12.363	0.72

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 5)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	lags17
CB416	SBC	-32.07038	-31.58401	-31.08684	-30.61309	-30.17204	-29.7531	-29.39049	-28.9883	-26.65649	-25.86224	-25.86224	
	HQC	-33.06351	-32.5734	-32.0836	-31.5936	-31.1038	-30.6139	-30.1241	-29.6343	-28.70064	-28.39575	-28.24588	
	LB	33.552	35.987	36.168	37.115	36.632	36.168	35.705	35.273	34.842	35.804	40.795	0.09
	LM(1)	18.475	19.284	20.093	21.324	22.555	23.786	25.017	26.248	27.479	28.710	30.941	0.81
CB417	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-31.9174	-31.48174	-31.04608	-30.61042	-30.17476	-29.73910	-29.30344	-28.86778	-28.43212	-28.28139	-28.28139	-27.97945
	HQC	-32.41053	-31.97486	-31.53920	-31.10354	-30.66788	-30.23222	-29.79656	-29.36090	-28.92524	-28.92524	-30.36309	0.00
	LB	37.3668	38.502	39.638	40.774	41.909	43.045	44.181	45.317	46.453	47.589	48.725	0.88
CB418	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-32.03758	-31.61828	-31.20333	-30.79115	-30.37897	-29.96679	-29.55461	-29.14243	-26.55437	-25.88988	-25.62699	
	HQC	-32.53071	-32.11972	-31.70977	-31.29982	-30.88987	-30.47992	-30.06997	-29.65997	-29.00946	-28.11669	-28.11669	0.13
	LB	35.2414	36.377	37.512	38.648	39.784	40.919	42.055	43.191	44.327	45.463	46.599	0.78
CB419	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-32.40173	-31.96993	-31.53813	-31.10633	-30.67453	-30.24273	-29.81093	-29.37913	-26.97946	-26.49404	-26.21424	
	HQC	-32.89586	-32.46406	-32.03226	-31.60046	-31.16866	-30.73686	-30.30506	-29.87326	-29.22311	-28.90732	-28.90732	-28.59788
	LB	38.6793	39.815	40.951	42.087	43.223	44.359	45.495	46.631	47.767	48.903	50.039	0.21
CB420	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.50721	-30.01883	-29.5724	-29.1260	-28.6796	-28.2332	-27.7868	-27.3404	-26.62359	-26.68051	-26.39274	
	HQC	-31.00034	-30.51196	-30.02358	-29.53520	-29.04682	-28.55844	-28.07006	-27.58168	-26.51882	-26.40877	-26.08779	
	LB	37.6631	38.800	39.937	41.074	42.211	43.348	44.485	45.622	46.759	47.896	49.033	0.00
CB421	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.51615	-30.02777	-29.5814	-29.1350	-28.6886	-28.2422	-27.7958	-27.3494	-26.63259	-26.52270	-26.22515	
	HQC	-31.00928	-30.52090	-30.03252	-29.54414	-29.05576	-28.56738	-28.07894	-27.59050	-26.52765	-26.41776	-26.08779	
	LB	34.6373	35.774	36.911	38.048	39.185	40.322	41.459	42.596	43.733	44.870	46.007	0.91
CB422	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.84102	-30.35264	-29.9063	-29.4600	-29.0137	-28.5674	-28.1211	-27.6748	-26.95796	-26.84807	-26.55051	
	HQC	-31.33416	-30.84578	-30.35740	-29.86902	-29.38064	-28.89226	-28.40388	-27.91550	-26.85265	-26.74276	-26.40779	
	LB	37.615	38.752	39.889	41.026	42.163	43.300	44.437	45.574	46.711	47.848	48.985	0.15
CB423	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-29.91064	-29.4643	-29.0180	-28.5717	-28.1254	-27.6791	-27.2328	-26.7865	-26.06964	-25.95975	-25.66219	
	HQC	-30.40377	-29.91539	-29.42701	-28.93863	-28.45025	-27.96187	-27.47349	-26.98511	-25.92226	-25.81237	-25.46483	
	LB	39.284	40.421	41.558	42.695	43.832	44.969	46.106	47.243	48.380	49.517	50.654	0.24
CB424	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.51969	-30.03131	-29.5850	-29.1387	-28.6924	-28.2461	-27.8000	-27.3537	-26.63684	-26.52695	-26.17939	
	HQC	-31.01282	-30.52444	-30.03606	-29.54768	-29.05930	-28.57092	-28.08254	-27.59416	-26.53131	-26.42142	-26.08447	
	LB	38.252	39.389	40.526	41.663	42.800	43.937	45.074	46.211	47.348	48.485	49.622	0.00
CB425	Rank(s)	0	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.37107	-29.96643	-29.56179	-29.15715	-28.75251	-28.34787	-27.94323	-27.53859	-26.82174	-26.71185	-26.36429	
	HQC	-30.86442	-30.37604	-29.88766	-29.39928	-28.91090	-28.42252	-27.93414	-27.44576	-26.38291	-26.27302	-25.92546	
	LB	39.3669	40.504	41.642	42.780	43.918	45.056	46.194	47.332	48.470	49.608	50.746	0.35

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis:p-value (Continued: 6)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12 + 2
CB426	SBC	-33.1538	-32.6318	-32.1904	-31.7471	-31.3178	-30.8982	-30.6186	-30.3687	-29.93115	-29.58014	-29.04329
	HQC	-33.6493	-33.3309	-33.1298	-32.6947	-32.6694	-32.2684	-32.33808	-32.63631	-31.9953	-31.88096	-31.42693
	LB	346.44	363.91	353.43	370.875	375.294	359.038	403.589	410.896	413.894	441.73	452.441
	LM(1)	6.96	12.645	15.323	18.933	15.246	8.968	8.968	12.208	12.036	6.321	14.867
CB427	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-33.22213	-32.67327	-32.13521	-31.69081	-31.28811	-31.02387	-30.62939	-30.29289	-27.19238	-26.65382	-26.25715
	HQC	-33.71236	-33.39488	-33.09919	-32.63817	-32.63038	-32.24745	-31.92462	-31.28064	-29.25653	-28.88064	-28.64114
	LB	345.011	365.624	386.538	394.482	391.862	397.482	456.264	456.264	373.57	381.954	385.999
CB428	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-33.8269	-33.08111	-32.69516	-32.20746	-31.63529	-31.13402	-30.74363	-30.30435	-27.35043	-26.87398	-26.67998
	HQC	-34.07582	-33.80272	-33.63455	-33.32269	-33.17121	-32.83564	-32.63886	-32.63886	-29.90668	-29.57726	-29.25726
	LB	388.138	385.713	376.091	392.994	381.29	406.003	471.33	471.33	392.052	381.507	390.954
CB429	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-32.9962	-32.01073	-31.56067	-31.14149	-30.71542	-30.42423	-30.01498	-29.63032	-29.25779	-28.75688	-28.38537
	HQC	-32.98375	-32.73234	-32.50007	-32.28885	-32.06169	-31.96105	-31.7346	-31.52555	-31.32194	-30.9837	-30.76921
	LB	363.426	354.718	377.161	388.811	374.15	384.47	401.37	416.614	435.916	439.294	452.35
CB430	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-32.94027	-32.52264	-32.13623	-31.74714	-31.42272	-31.03723	-30.64804	-30.39347	-29.97894	-29.63651	-29.03065
	HQC	-33.4334	-33.24426	-33.07563	-32.8945	-32.76899	-32.57405	-32.36766	-32.23871	-32.04309	-31.86291	-31.41429
	LB	385.346	378.362	379.497	400.6	398.171	406.931	411.085	425.837	434.923	431.318	436.756
CB431	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-32.90104	-32.4796	-32.03892	-31.75455	-31.54	-31.2566	-30.76574	-30.29895	-29.58715	-29.98274	-28.57091
	HQC	-33.20121	-32.97831	-32.97831	-32.90171	-32.88627	-32.89342	-32.88537	-32.89509	-29.65113	-29.20956	-28.95455
	LB	401.333	397.987	404.838	422.888	409.446	408.553	411.927	462.846	427.769	395.383	399.419
CB432	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-31.03441	-30.41079	-29.85197	-29.5262	-29.10689	-28.7938	-28.46845	-28.10023	-27.58745	-27.3043	-26.91904
	HQC	-31.52754	-31.13241	-30.89137	-30.70998	-30.43315	-30.18808	-30.18808	-29.98446	-29.8316	-29.53112	-29.30268
	LB	353.233	353.292	380.335	384.275	391.054	417.158	415.686	431.42	431.42	450.54	443.75
CB433	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-31.41479	-30.89827	-30.46033	-30.1606	-29.76578	-29.47161	-29.09703	-28.77644	-28.36853	-27.9667	-27.49015
	HQC	-31.90792	-31.61989	-31.33972	-31.03975	-31.11205	-31.00843	-30.81666	-30.67167	-30.43267	-30.19351	-29.87979
	LB	403.708	412.36	418.092	413.664	397.504	415.642	416.115	440.494	453.684	463.02	458.354
CB434	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-31.3874	-30.89285	-30.43333	-30.11087	-29.82724	-29.51569	-29.09671	-28.64881	-26.13812	-25.44487	-25.05999
	HQC	-31.88053	-31.61446	-31.37273	-31.17373	-31.17373	-31.05251	-30.81633	-30.54404	-28.20227	-27.67168	-27.43963
	LB	410.28	412.021	436.213	449.086	445.521	445.774	465.967	505.548	449.365	396.603	404.338
CB435	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-30.8448	-30.47132	-30.02045	-29.78118	-29.43272	-29.15493	-28.84847	-28.50318	-28.16268	-27.50392	-27.07677
	HQC	-31.33794	-31.19293	-30.95985	-30.79889	-30.69975	-30.56809	-30.39841	-30.25689	-29.73073	-29.46041	-29.46041
	LB	436.89	431.826	431.826	434.57	443.239	443.239	452.392	455.526	445.751	416.042	408.921

\*: 5% of upper and lower tail



Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p value (Continued: 7)

Combination	Rank(4)	Rank(3)	Rank(2)	Rank(1)	Rank(0)	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	lags13
CB501	SBC	-41.62971	-40.84384	-40.16415	-39.02311	-38.38758	-37.42191	-37.42191	-37.42191	-37.886	-37.42191	-34.87156	-33.89659	-33.23181	
	HQC	-42.45272	-42.03743	-41.70519	-41.19927	-40.63037	-40.42803	-40.42803	-40.42803	-40.63037	-40.42803	-38.12096	-37.39278	-36.59523	
	LB	531.493	552.652	596.119	635.635	639.084	639.084	639.084	639.084	647.304	685.865	703.206	703.206	707.346	0.00
	LM(1)	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431	42.431
CB502	Rank(4)	22.123	20.962	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001
	SBC	-44.45791	-43.71556	-42.99304	-42.31183	-41.96999	-41.23838	-40.68831	-40.15447	-39.34327	-38.51619	-37.34327	-36.30724	-35.71972	
	HQC	-45.27292	-44.90915	-44.43408	-44.14214	-43.79637	-43.43263	-43.43263	-43.43263	-43.43263	-43.43263	-43.43263	-40.60066	-39.80043	
	LB	549.093	574.727	586.772	599.338	609.308	617.208	631.208	639.339	659.342	693.842	736.739	736.739	725.378	0.00
CB503	Rank(1)	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623	30.623
	Rank(4)	28.918	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883	18.883
	SBC	-43.13761	-43.1906	-41.6586	-40.76257	-40.39762	-39.81179	-39.26637	-39.26637	-39.26637	-39.26637	-36.09148	-35.05857	-34.36007	
	HQC	-43.96062	-43.38419	-42.97789	-42.57377	-42.17958	-41.59948	-41.30737	-41.30737	-41.30737	-41.30737	-39.34887	-38.55476	-38.08451	
CB504	Rank(1)	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959	32.959
	Rank(4)	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919
	SBC	-42.21639	-41.84478	-40.76761	-39.63211	-39.10117	-38.56305	-38.17317	-38.17317	-38.17317	-37.83857	-37.38954	-36.50839	-35.50839	
	HQC	-43.0394	-42.67838	-42.30865	-41.89815	-41.52884	-41.16299	-41.16299	-41.16299	-41.16299	-41.16299	-40.88574	-40.88574	-40.2382	
CB505	Rank(1)	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878
	Rank(4)	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919	28.919
	SBC	-42.2347	-41.84478	-40.76761	-39.63211	-39.10117	-38.56305	-38.17317	-38.17317	-38.17317	-37.83857	-37.38954	-36.50839	-35.50839	
	HQC	-43.0572	-42.67838	-42.30865	-41.89815	-41.52884	-41.16299	-41.16299	-41.16299	-41.16299	-41.16299	-40.88574	-40.88574	-40.2382	
CB506	Rank(1)	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138	33.138
	Rank(4)	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037	16.037
	SBC	-42.2347	-41.84478	-40.76761	-39.63211	-39.10117	-38.56305	-38.17317	-38.17317	-38.17317	-37.83857	-37.38954	-36.50839	-35.50839	
	HQC	-43.0572	-42.67838	-42.30865	-41.89815	-41.52884	-41.16299	-41.16299	-41.16299	-41.16299	-41.16299	-40.88574	-40.88574	-40.2382	
CB507	Rank(1)	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007
	Rank(4)	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754	29.754
	SBC	-40.94474	-40.17179	-39.53214	-38.99958	-38.52881	-37.2881	-36.90401	-36.90401	-36.90401	-36.52007	-33.65164	-32.90468	-32.48913	
	HQC	-41.76775	-41.36538	-40.93517	-40.47573	-40.03966	-39.59966	-39.64833	-39.64833	-39.64833	-39.53782	-36.90903	-36.40087	-36.21357	
CB508	Rank(1)	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521
	Rank(4)	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007	30.007
	SBC	-39.43201	-38.48018	-37.69962	-37.05054	-36.49204	-35.75463	-35.23294	-35.23294	-35.23294	-34.88145	-32.49081	-32.90468	-31.68375	
	HQC	-40.2502	-39.67377	-39.24065	-38.91838	-38.51838	-38.2242	-37.97726	-37.97726	-37.97726	-37.88858	-35.7482	-35.7482	-35.17994	
CB509	Rank(1)	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521	38.521
	Rank(4)	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392	20.392
	SBC	-38.75182	-38.06516	-37.59066	-36.40266	-36.04992	-35.40252	-34.89258	-34.89258	-34.89258	-34.4874	-32.49291	-32.49291	-32.49291	
	HQC	-39.57484	-39.09425	-38.71175	-38.4705	-38.2242	-37.97726	-37.97726	-37.97726	-37.97726	-37.97726	-37.49453	-37.29667	-36.69754	
CB510	Rank(1)	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878	35.1878
	Rank(4)	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62	28.62
	SBC	-40.06516	-38.06516	-37.33906	-36.35529	-35.77801	-35.40252	-34.89258	-34.89258	-34.89258	-34.4874	-32.49291	-32.49291	-32.49291	
	HQC	-40.88459	-39.25875	-38.9306	-38.2568	-38.2568	-38.2568	-38.2568	-38.2568	-38.2568	-37.93249	-35.92727	-34.81729	-34.10625	

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis:p-value (Continued: 8)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12 + 2
CBS11	SBC	-39.29751	-38.41725	-37.75834	-37.11623	-36.66938	-36.07755	-35.68094	-35.27294	-32.9716	-31.85826	-31.20817
	HQC	-40.12052	-39.61084	-39.00407	-38.54534	-38.28006	-38.42526	-38.48553	-38.28006	-36.29899	-35.34445	-34.93261
	LB	537.284	564.352	616.456	629.322	614.01	644.315	675.531	688.481	688.481	740.474	715.575
	LM(4)	31.988	31.988	26.268	23.477	21.476	22.096	24.25	23.481	24.25	20.591	18.441
CBS12	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-42.27705	-41.3425	-40.58356	-39.87342	-39.56613	-38.91056	-38.28935	-37.8404	-35.1491	-34.01265	-33.36745
	HQC	-43.10007	-42.53609	-42.12459	-41.74127	-41.47229	-41.37835	-41.03367	-40.84753	-38.4065	-37.50884	-37.09189
	LB	476.885	531.467	540.556	556.613	562.305	617.725	633.947	676.225	664.101	670.605	679.08
CBS13	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-41.47871	-40.67034	-39.92874	-39.26385	-38.85981	-38.15388	-37.87515	-37.22837	-34.39064	-32.82174	-32.82174
	HQC	-42.03173	-41.86393	-41.66978	-41.13369	-41.03596	-40.62167	-40.30724	-40.24968	-40.02831	-39.77793	-39.29924
	LB	506.244	538.71	553.842	566.124	574.755	605.646	621.316	662.704	675.188	715.404	741.465
CBS14	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-41.56695	-40.7874	-39.97028	-39.39347	-39.06704	-38.43702	-37.87515	-37.22837	-34.39064	-32.82174	-32.82174
	HQC	-42.38996	-41.98099	-41.51131	-41.20132	-41.02241	-40.90481	-40.61947	-40.23549	-38.50765	-37.1532	-36.54983
	LB	503.793	554.471	598.098	613.852	606.076	597.077	638.599	660.09	688.377	692.41	703.033
CBS15	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-41.9821	-41.19326	-40.5385	-39.99775	-39.68403	-39.18046	-38.59801	-38.01563	-35.24025	-34.21913	-33.54206
	HQC	-42.80512	-42.38885	-42.10489	-41.86359	-41.86018	-41.64825	-41.34233	-41.02275	-38.50765	-37.1532	-36.54983
	LB	549.919	554.34	575.701	605.387	584.119	597.077	623.947	616.75	730.659	682.488	705.466
CBS16	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-39.97065	-38.97185	-38.24334	-37.62577	-37.16839	-36.04073	-35.65577	-35.65577	-35.379	-34.96577	-34.14515
	HQC	-40.79366	-40.16544	-39.78437	-39.49362	-39.34455	-38.78505	-38.78505	-38.63437	-38.63437	-38.46196	-37.86959
	LB	516.091	542.907	553.906	572.756	596.848	634.376	678.704	696.726	736.653	793.783	789.353
CBS17	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-40.07244	-39.13516	-38.26658	-37.61964	-37.18614	-36.13298	-35.59418	-35.49266	-32.97312	-32.118	-31.36551
	HQC	-40.89546	-40.33875	-39.80761	-39.48749	-39.36233	-38.87773	-38.87773	-38.49978	-36.23052	-35.61419	-35.08995
	LB	489.716	530.382	560.778	612.858	628.068	666.969	678.415	710.445	731.333	739.179	690.423
CBS18	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-40.50378	-39.54759	-38.83842	-38.27604	-37.88446	-36.87451	-36.53067	-36.30284	-33.89272	-32.83132	-32.0273
	HQC	-41.32679	-40.74118	-40.33945	-40.14389	-40.00661	-39.61883	-39.61883	-39.30996	-37.15012	-36.32751	-35.75174
	LB	560.332	587.726	604.117	626.058	631.725	649.131	672.095	733.214	811.543	745.512	717.841
CBS19	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-39.1981	-38.56152	-37.76503	-37.18704	-36.7332	-36.16801	-35.68021	-35.17668	-32.89753	-34.27115	-33.55024
	HQC	-40.02112	-39.75511	-39.30606	-39.03488	-38.63538	-38.18381	-38.18381	-38.18381	-38.18381	-37.76734	-37.27467
	LB	524.708	541.227	603.496	603.496	605.107	637.823	649.873	677.775	733.239	748.289	717.552
CBS20	Rank(s)	0	0	0	0	0	0	0	0	0	0	0
	SBC	-39.83399	-39.00759	-38.33418	-37.83169	-37.32642	-36.77505	-36.33123	-35.91503	-35.58738	-35.13894	-34.19946
	HQC	-40.657	-40.20118	-39.69521	-39.50258	-39.50258	-39.03685	-38.84478	-38.84478	-38.63513	-38.63513	-37.92989
	LB	597	602.182	615.418	612.958	603.599	648.562	683.519	681.313	702.983	739.235	721.104

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 9)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	lags13
CB521	SBC	-39.7682	-39.0181	-38.2634	-37.7806	-37.44708	-36.9696	-36.6425	-35.9976	-35.64796	-35.48236	-31.7155	
	HQC	-40.9283	-40.2124	-39.8043	-39.65591	-39.52324	-39.43765	-39.36682	-39.30689	-39.25036	-39.20755	-35.44199	0.00
	LB	553.696	564.126	611.118	645.483	645.436	646.309	672.588	685.099	734.687	743.458	0.00	0.00
	LM(1)	40.675	19.37	29.933	32.908	33.111	33.111	32.978	32.978	32.978	32.978	32.978	32.978
CB601	Rank(s)	28.345	23.704	24.456	24.656	24.656	24.656	24.656	24.656	24.656	24.656	24.656	31.169
	SBC	-51.02587	-50.22354	-49.06855	-47.8998	-47.44341	-46.82214	-46.4097	-45.5978	-44.78919	-44.18059	-40.65987	
	HQC	-52.30033	-52.05204	-51.40663	-50.70912	-50.59156	-50.08851	-50.08851	-49.9885	-49.52727	-48.86407	-46.02366	0.00
	LB	699.618	718.488	777.345	831.779	873.673	902.963	906.270	999.203	1136.273	1163.604	0.00	1190.989
CB602	Rank(s)	35.008	25.659	25.64	25.659	25.64	25.659	25.64	25.659	25.64	25.659	25.64	25.659
	SBC	-47.74345	-46.99662	-45.54681	-44.1864	-43.52475	-42.95127	-42.11341	-41.76821	-41.06395	-38.24759	-37.29056	
	HQC	-49.01791	-48.82512	-48.20229	-47.70629	-46.77199	-46.60721	-46.15222	-46.16692	-45.80203	-43.30657	-42.65375	0.00
	LB	675.97	702.56	752.773	824.344	884.401	879.042	919.588	976.949	1092.807	1082.052	0.00	1103.901
CB603	Rank(s)	39.537	38.625	31.699	29.27	35.505	30.912	42.07	39.169	53.315	36.207	28.31	0.82
	SBC	-50.38179	-49.62949	-48.19109	-47.00933	-46.64273	-46.01146	-44.96782	-44.58746	-43.76785	-40.53894	-39.57844	
	HQC	-51.85625	-50.52916	-49.88968	-49.88968	-49.88968	-49.6674	-49.00663	-48.90663	-48.50293	-45.59793	-44.94163	0.00
	LB	680.54	698.746	740.268	779.266	826.85	833.574	906.275	957.942	1080.891	1027.75	0.00	1083.414
CB604	Rank(s)	41.761	30.491	30.491	29.207	38.804	21.752	40.415	26.422	33.928	25.464	25.732	0.90
	SBC	-48.98059	-47.79781	-46.71392	-45.2266	-44.7652	-44.1153	-43.1772	-42.8508	-42.18443	-39.25679	-38.19884	
	HQC	-50.25305	-49.62631	-48.712	-48.03196	-48.01245	-47.80894	-47.5653	-47.24951	-46.92251	-44.51577	-43.56203	0.00
	LB	670.488	695.914	719.938	775.009	848.618	890.626	957.423	1049.894	1157.598	1098.047	0.00	1140.824
CB605	Rank(s)	35.949	28.648	31.881	30.586	35.911	20.727	34.631	30.136	50.945	48.612	37.680	0.39
	SBC	-48.4093	-47.5093	-46.95491	-44.84286	-44.2495	-43.6937	-42.8983	-42.63927	-42.15665	-41.77116	-40.36214	
	HQC	-49.41538	-49.33781	-48.92939	-48.75219	-48.01245	-47.53164	-46.93711	-47.03798	-46.87073	-46.83014	-45.7253	0.00
	LB	698.668	701.62	776.406	784.382	858.064	885.283	961.265	974.851	1062.303	1097.9	0.00	1149.686
CB606	Rank(s)	37.819	30.426	35.302	45.439	43.233	38.717	42.122	39.189	41.316	44.034	39.896	0.30
	SBC	-48.24621	-47.22623	-45.84403	-44.75449	-44.30624	-43.80851	-43.1022	-42.59212	-41.96721	-38.91034	-37.78877	
	HQC	-49.20267	-49.15474	-48.8211	-47.58482	-47.53349	-47.46444	-47.141	-46.99084	-46.7053	-43.96932	-43.15196	0.00
	LB	707.795	712.989	766.425	840.447	905.265	889.795	932.307	979.878	1115.841	1077.596	0.00	1095.026
CB607	Rank(s)	32.872	27.458	29.562	31.963	42.453	40.284	34.249	46.467	43.013	45.255	40.376	0.28
	SBC	-48.68883	-48.05708	-46.57203	-45.32111	-45.01038	-44.38489	-43.83771	-43.37442	-42.65083	-39.85259	-38.40955	
	HQC	-50.44329	-49.88559	-48.91011	-48.33043	-48.25763	-48.04082	-47.87451	-47.77513	-47.38891	-44.91157	-43.77274	0.00
	LB	755.616	738.244	772.544	826.151	836.075	851.873	937.518	1013.675	1106.513	1110.991	0.00	1117.837
CB701	Rank(s)	57.801	48.184	32.047	40.231	56.138	41.834	26.603	37.084	44.369	38.698	39.077	0.33
	SBC	-57.4801	-55.78519	-54.0968	-52.63768	-51.50702	-50.20217	-48.8834	-49.53702	-48.8834	-45.76702	-44.33078	
	HQC	-58.4667	-58.4667	-57.46373	-56.43282	-56.09559	-56.08796	-55.82022	-55.62009	-55.59858	-52.68654	-51.63068	0.00
	LB	821.092	897.844	953.333	1057.611	1093.432	1164.151	1291.112	1371.02	1461.29	1566.218	0.00	1637.772
CB702	Rank(s)	68.911	50.259	40.399	40.399	50.862	43.934	47.683	51.992	62.058	49.959	48.056	0.51
	SBC	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	0.00
	HQC	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	-68.911	0.00
	LB	68.911	68.911	68.911	68.911	68.911	68.911	68.911	68.911	68.911	68.911	68.911	0.00

\*. 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p-value (Continued: 10)

Combination	Rank(0)	Rank(1)	Rank(2)	Rank(3)	Rank(4)	Rank(5)	Rank(6)	Rank(7)	Rank(8)	Rank(9)	lags10	lags11	lags12 + 2
US301	SBC	-28.08414	-27.75982	-27.75982	-27.75982	-27.75982	-27.75982	-27.75982	-27.75982	-27.75982	-23.02483	-22.80816	-22.54962
	HQC	-28.34328	-28.14486	-27.97999	-27.8547	-27.8547	-27.8547	-27.8547	-27.8547	-27.8547	-24.29355	-24.05477	-23.89041
	LB	241.616	0.21	235.989	0.16	236.583	0.25	240.534	0.12	240.534	199.999	189.746	182.004
	LM(1)	7.787	0.56	6.938	0.64	9.708	0.37	10.093	0.76	8.228	13.228	6.983	5.67
US302	SBC	8.059	0.53	10.043	0.35	12.146	0.21	17.606	0.04	14.599	16.633	10.349	7.873
	HQC	-26.5086	-26.65242	-26.65242	-26.65242	-26.65242	-26.65242	-26.65242	-26.65242	-26.65242	-25.17057	-25.04047	-24.89611
	LB	236.654	0.25	226.135	0.47	230.802	0.38	229.475	0.40	236.449	260.791	264.992	274.06
	LM(1)	14.336	0.12	7.468	0.59	5.531	0.94	16.466	0.06	8.021	11.79	12.031	8.094
US303	SBC	4.786	0.85	3.31	0.95	4.812	0.85	5.044	0.83	13.461	5.928	4.789	1.996
	HQC	-28.01026	-27.74167	-27.5826	-27.25387	-27.25387	-27.25387	-27.25387	-27.25387	-27.25387	-23.06803	-22.82613	-22.63958
	LB	28.2714	-28.12071	-28.0608	0.11	236.408	0.29	230.741	0.38	240.658	187.276	181.304	177.74
	LM(1)	248.426	0.13	250.955	0.17	6.408	0.70	14.387	0.11	6.624	11.334	12.464	5.944
US304	SBC	8.799	0.46	4.399	0.88	7.998	0.88	7.998	0.88	11.521	10.421	8.966	5.572
	HQC	-27.71618	-27.43708	-27.27003	-27.0129	-27.0129	-27.0129	-27.0129	-27.0129	-27.0129	-22.57639	-22.30391	-22.10847
	LB	27.9773	0.02	288.89	0.04	263.385	0.07	267.216	0.01	270.007	226.219	223.259	221.458
	LM(1)	6.408	0.70	14.387	0.11	6.624	0.68	8.285	0.51	12.533	5.706	3.996	5.197
US305	SBC	7.296	0.61	6.316	0.71	5.609	0.78	8.142	0.52	5.991	11.958	18.371	10.378
	HQC	-25.35447	-25.23427	-25.23427	-25.23427	-25.23427	-25.23427	-25.23427	-25.23427	-25.23427	-23.84946	-23.47667	-23.26415
	LB	25.81561	0.28	230.254	0.39	238.579	0.25	235.315	0.17	238.864	261.49	251.244	243.761
	LM(1)	14.886	0.11	3.462	0.94	4.445	0.88	10.766	0.29	3.624	11.072	2.316	3.253
US306	SBC	6.403	0.70	5.986	0.74	7.289	0.61	11.386	0.25	11.849	8.653	8.953	3.783
	HQC	-26.7109	-26.42581	-26.42581	-26.42581	-26.42581	-26.42581	-26.42581	-26.42581	-26.42581	-22.05984	-21.49667	-21.30416
	LB	26.97204	0.47	220.255	0.58	224.71	0.49	241.7	0.21	237.588	245.743	222.566	162.288
	LM(1)	225.992	0.42	9.196	0.82	4.445	0.88	10.859	0.29	6.848	7.253	4.22	5.711
US307	SBC	7.164	0.62	6.595	0.64	7.911	0.54	12.856	0.17	18.637	13.753	13.753	4.333
	HQC	-26.23437	-26.00389	-26.00389	-26.00389	-26.00389	-26.00389	-26.00389	-26.00389	-26.00389	-21.62282	-21.14488	-20.91171
	LB	28.7612	0.00	297.001	0.00	271.963	0.30	292.387	0.00	298.443	308.451	247.683	241.806
	LM(1)	7.49	0.59	10.638	0.30	5.688	0.77	6.889	0.84	6.361	7.836	7.596	10.194
US308	SBC	9.717	0.57	9.234	0.42	5.47	0.79	5.47	0.79	5.47	17.641	10.786	7.387
	HQC	-25.54781	-25.44298	-25.44298	-25.44298	-25.44298	-25.44298	-25.44298	-25.44298	-25.44298	-23.03846	-23.59168	-23.34737
	LB	25.80995	0.19	219.48	0.59	224.044	0.51	231.54	0.37	232.15	235.705	188.695	192.658
	LM(1)	29.291	0.00	3.948	0.91	6.312	0.71	6.947	0.64	9.214	13.08	5.034	14.232
US309	SBC	5.583	0.78	3.119	0.96	3.999	0.91	3.999	0.91	4.037	4.037	6.009	7.283
	HQC	-25.14825	-24.9531	-24.9531	-24.9531	-24.9531	-24.9531	-24.9531	-24.9531	-24.9531	-23.49276	-23.10166	-22.90664
	LB	25.40338	0.00	292.063	0.00	301.72	0.00	304.999	0.00	310.303	303.518	276.663	288.816
	LM(1)	10.311	0.33	4.496	0.88	8.93	0.44	10.935	0.28	15.746	6.126	4.736	4.736
US310	SBC	8.1	0.52	5.148	0.82	5.598	0.78	19.739	0.02	16.43	12.963	5.832	12.685
	HQC	-26.26005	-26.10295	-26.10295	-26.10295	-26.10295	-26.10295	-26.10295	-26.10295	-26.10295	-22.75359	-22.11617	-20.89435
	LB	26.52119	0.01	277.57	0.01	270.332	0.02	272.243	0.01	301.202	305.437	284.557	199.778
	LM(1)	17.255	0.64	14.663	0.10	11.046	0.27	5.534	0.79	9.751	36.119	8.659	10.499

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criterions, and Residual Analysis: p-value (Continued: 11)

Combination	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12 + 2
US111	Rank(6)	-28.0986	-27.5648	-27.8183	-27.0805	-26.89228	-26.69652	-26.60956	-26.44088	-26.27225	-25.9709
	SBC	-28.18984	-28.06133	-27.87263	-27.13116	-27.04444	-26.76444	-26.65972	-26.59065	-26.51886	-25.3117
	HQC	236.769	237.661	235.994	246.267	247.953	250.119	252.11	239.271	233.553	231.516
	LM(1)	12.8	7.37	11.64	11.64	6.382	15.056	14.107	22.216	9.343	6.721
US112	Rank(6)	6.959	7.139	11.276	12.817	12.664	13.859	6.897	7.74	14.547	14.1
	SBC	-28.4228	-28.24794	-28.01467	-27.82383	-27.54181	-27.23312	-24.11902	-23.90928	-23.70777	-23.38317
	HQC	-29.10342	-28.75279	-28.63595	-28.55695	-28.18074	-28.18074	-25.16918	-25.05311	-24.95437	-24.72397
	LM(1)	7.359	10.051	14.788	14.878	10.051	11.393	213.232	229.238	217.073	113.69
US113	Rank(6)	12.462	14.878	17.76	14.363	14.1	7.328	39.335	20.504	8.039	4.966
	SBC	-28.8723	-28.6016	-28.07845	-27.81447	-27.62207	-27.36346	-24.27151	-23.90928	-23.63726	-23.323
	HQC	-29.13344	-28.86189	-28.69925	-28.54759	-28.31107	-28.31107	-25.32167	-25.05905	-24.90387	-24.66409
	LM(1)	6.7	19.235	7.915	4.185	5.455	18.927	27.611	231.865	240.85	220.239
US114	Rank(6)	10.726	8.716	6.386	6.905	12.667	1.093	25.046	13.437	24.7	17.531
	SBC	-27.6909	-27.18098	-26.89238	-26.65883	-26.60358	-26.39559	-26.13097	-26.02289	-25.88165	-25.63704
	HQC	-27.95664	-27.46833	-27.15138	-27.43894	-27.44558	-27.34321	-27.18113	-27.17266	-27.12825	-26.97784
	LM(1)	19.523	26.783	247.168	237.381	238.793	245.159	265.279	261.393	247.708	251.165
US115	Rank(6)	9.841	10.513	5.564	11.618	14.128	18.054	15.938	12.237	6.252	2.902
	SBC	-27.6945	-27.2463	-27.01051	-26.83195	-26.63435	-26.42156	-26.3873	-25.97789	-25.87577	-25.61128
	HQC	-27.95564	-27.75115	-27.63131	-27.56507	-27.47634	-27.36917	-27.13745	-27.12237	-26.93208	-26.75288
	LM(1)	7.134	8.827	14.093	10.46	13.56	15.73	8.85	239.083	231.106	217.987
US116	Rank(6)	13.763	12.846	10.151	4.733	23.009	22.384	17.083	18.869	14.404	14.691
	SBC	-28.42098	-28.20905	-27.77414	-27.58873	-27.34733	-27.05177	-23.9936	-23.58265	-23.30922	-23.08338
	HQC	-28.68212	-28.5941	-28.33985	-28.33185	-28.18933	-27.99939	-26.94376	-26.73242	-26.55382	-26.42417
	LM(1)	265.769	289.634	253.488	293.109	231.312	246.068	195.147	225.975	232.183	236.907
US117	Rank(6)	13.04	12.846	12.088	13.344	9.341	9.341	17.189	15.07	18.154	16.484
	SBC	-26.33767	-25.72714	-25.49692	-25.25826	-25.09002	-24.91182	-24.71575	-24.65652	-24.28735	-23.9842
	HQC	-26.9881	-26.23199	-26.11772	-25.93202	-25.93202	-25.85944	-25.76591	-25.51395	-25.51395	-25.325
	LM(1)	11.659	8.83	6.683	6.793	5.074	230.43	241.456	262.352	237.704	232.132
US118	Rank(6)	7.408	11.746	7.428	5.007	8.463	7.837	7.962	4.424	7.48	9.544
	SBC	-26.30346	-25.82252	-25.57881	-25.38578	-25.31281	-25.14306	-24.96233	-24.641	-24.36415	-24.04079
	HQC	-26.5646	-26.32737	-26.19961	-26.1189	-26.1548	-26.09068	-26.01248	-25.79077	-25.61075	-25.38159
	LM(1)	7.179	6.287	11.043	13.823	9.322	282.059	293.427	288.835	287.634	285.672
US119	Rank(6)	8.823	4.505	16.625	13.691	6.468	4.575	11.9	17.123	15.417	13.43
	SBC	-26.99671	-26.47776	-26.21065	-26.00054	-25.81055	-25.56901	-25.48926	-25.41814	-25.03941	-24.75026
	HQC	-27.25785	-26.98261	-26.83145	-26.67365	-26.52524	-26.51663	-23.92841	-23.92841	-23.28602	-23.09105
	LM(1)	9.191	8.211	12.55	11.805	10.415	266.706	272.573	269.742	233.228	207.738
US120	Rank(6)	7.379	5.365	9.878	8.707	7.993	7.325	30.665	7.573	15.602	21.278
	SBC	-25.90566	-25.7994	-25.72556	-25.05731	-24.81706	-24.81706	-24.81706	-24.41132	-24.06348	-23.83996
	HQC	-26.18444	-25.98978	-25.86835	-25.79042	-25.78165	-25.76468	-25.63664	-25.56108	-25.28909	-25.18076
	LM(1)	289.007	288.154	283.384	276.204	267.203	267.203	303.681	293.145	259.445	239.328
US121	Rank(6)	8.107	8.332	10.631	14.607	10.298	8.237	6.014	22.482	11.087	7.059
	SBC	-25.90566	-25.7994	-25.72556	-25.05731	-24.81706	-24.81706	-24.81706	-24.41132	-24.06348	-23.83996
	HQC	-26.18444	-25.98978	-25.86835	-25.79042	-25.78165	-25.76468	-25.63664	-25.56108	-25.28909	-25.18076
	LM(1)	19.068	8.093	10.865	18.552	12.184	10.865	10.121	22.482	11.087	7.059

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p-value (Continued: 12)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	P
US321	SBC	-23.12124	-22.88361	-22.62841	-22.40099	-22.19683	-22.08026	-21.90423	-21.64485	-21.47712	-21.13962	-20.89577	2
	HOC	-23.38238	-23.20685	-23.13326	-23.02018	-22.92295	-22.84227	-22.85185	-22.69501	-22.62688	-22.38622	-22.23649	2
	LB	241.375	243.209	253.946	251.048	255.689	247.227	252.702	272.659	277.659	280.136	251.368	0.02
	LM(4)	8.864	8.864	8.864	8.864	8.864	8.864	8.864	8.864	8.864	8.864	8.864	0.02
US322	SBC	-24.64009	-24.44009	-24.20239	-23.99409	-23.80383	-23.64602	-23.44331	-23.17898	-23.01563	-22.78083	-22.53777	3
	HOC	-24.88664	-24.82513	-24.70724	-24.62313	-24.56905	-24.48802	-24.41992	-24.16564	-24.02743	-24.02743	-23.87856	0.01
	LB	232.12	232.12	240.342	234.062	240.802	225.19	225.19	225.19	235.188	235.188	247.527	0.03
	LM(4)	14.896	14.896	15.047	15.047	15.047	15.047	15.047	15.047	15.047	15.047	15.047	0.03
US323	SBC	-25.61846	-25.35162	-25.16446	-24.94009	-24.78659	-24.62068	-24.19351	-20.98718	-20.67803	-20.43758	-20.13387	2
	HOC	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	-25.73066	2
	LB	220.226	220.226	220.226	220.226	220.226	220.226	220.226	220.226	220.226	220.226	220.226	0.01
	LM(4)	9.584	9.584	9.584	9.584	9.584	9.584	9.584	9.584	9.584	9.584	9.584	0.01
US324	SBC	-24.86829	-24.60655	-24.44613	-24.17214	-24.02448	-23.84411	-23.66912	-23.46516	-23.16545	-22.99357	-22.65392	1
	HOC	-25.12942	-25.04559	-24.95098	-24.92994	-24.86861	-24.61074	-24.61074	-24.61074	-24.61074	-24.61074	-24.61074	1
	LB	220.741	225.803	204.237	215.923	204.605	210.469	210.469	210.469	210.469	210.469	210.469	0.12
	LM(4)	4.028	4.028	4.028	4.028	4.028	4.028	4.028	4.028	4.028	4.028	4.028	0.12
US325	SBC	-24.89672	-24.71386	-24.65343	-24.60018	-23.82197	-23.65052	-23.48125	-23.24023	-23.19373	-22.93827	-22.64047	1
	HOC	-25.15786	-24.95889	-24.77028	-24.62099	-24.49251	-24.42886	-24.42886	-24.42886	-24.42886	-24.42886	-24.42886	1
	LB	192.041	198.798	225.259	229.461	229.433	211.483	206.639	206.639	206.639	206.639	206.639	0.01
	LM(4)	11.284	11.284	11.284	11.284	11.284	11.284	11.284	11.284	11.284	11.284	11.284	0.01
US326	SBC	-22.35559	-22.20903	-22.02827	-21.92555	-21.82543	-21.72928	-21.68061	-21.62604	-21.57179	-21.51779	-21.46392	1
	HOC	-23.01704	-23.30126	-23.01704	-23.188	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	1
	LB	246.084	246.335	250.631	261.146	261.285	281.747	288.321	288.321	288.321	288.321	288.321	0.01
	LM(4)	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	0.01
US327	SBC	-23.1622	-23.1622	-22.7284	-22.5672	-22.31588	-22.09261	-21.85012	-21.62328	-21.80244	-21.25135	-18.07986	3
	HOC	-23.01704	-23.30126	-23.01704	-23.188	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	1
	LB	246.084	246.335	250.631	261.146	261.285	281.747	288.321	288.321	288.321	288.321	288.321	0.01
	LM(4)	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	7.688	0.01
US328	SBC	-22.30919	-22.1097	-21.87278	-21.70187	-21.4742	-21.8231	-21.07219	-20.79733	-20.60603	-20.58531	-20.08351	1
	HOC	-22.49474	-22.37763	-22.37763	-22.32768	-22.20754	-22.10431	-22.03981	-21.84749	-21.7558	-21.50491	-21.42431	1
	LB	248.439	264.831	277.398	268.564	262.163	260.477	268.341	280.443	280.443	271.138	256.449	0.01
	LM(4)	6.914	6.914	6.914	6.914	6.914	6.914	6.914	6.914	6.914	6.914	6.914	0.01
US329	SBC	-22.43273	-22.43273	-22.1922	-21.92876	-21.70249	-21.47639	-21.28188	-21.03053	-21.02228	-20.50298	-20.35397	3
	HOC	-23.01704	-23.30126	-23.01704	-23.188	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	-22.92774	1
	LB	203.864	187.794	212.744	211.852	219.138	226.941	248.028	248.028	254.962	268.963	220.469	0.26
	LM(4)	5.196	5.196	5.196	5.196	5.196	5.196	5.196	5.196	5.196	5.196	5.196	0.26
US330	SBC	-24.91988	-24.6467	-24.42203	-24.22703	-23.97097	-23.9127	-23.40323	-20.26735	-19.85162	-19.54333	-19.33695	3
	HOC	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	-25.03174	1
	LB	234.807	245.739	235.843	233.738	247.21	269.205	269.205	269.205	179.661	167.189	161.175	0.98
	LM(4)	6.444	6.444	6.444	6.444	6.444	6.444	6.444	6.444	6.444	6.444	6.444	0.98

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 13)

Combination	lags2		lags3		lags4		lags5		lags6		lags7		lags8		lags9		lags10		lags11		lags12		lags13	
	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0	Rank(k)	0
US331	SBC	-23.82398	-23.5859	-23.1472	-23.1874	-22.8951	-22.6456	-22.4872	-22.22167	-22.02661	-21.85327	-21.67686	-21.50165											
	HOC	-24.08512	-23.97084	-23.81957	-23.5955	-23.26065	-23.13975	-23.07895	-23.10282	-23.27182	-23.17638	-23.09987	-23.01765											
	LB	22.7313	23.1958	23.9461	23.7535	23.0263	24.2189	24.2189	23.1586	26.2646	29.813	27.0744	28.999											
	LM(1)	7.828	8.255	10.183	9.906	9.306	9.306	9.306	11.604	12.414	15.419	15.419	15.419											
US332	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-24.16986	-23.88896	-23.64051	-23.37376	-23.13945	-22.93063	-22.76517	-22.638618	-22.36618	-22.20282	-22.06633	-21.92775											
	HOC	-24.431	-24.14536	-23.9457	-23.59456	-23.37827	-23.27262	-23.45628	-23.45628	-23.45628	-23.45628	-23.45628	-23.45628											
	LM(1)	12.966	12.966	12.966	12.966	12.966	12.966	12.966	12.966	12.966	12.966	12.966	12.966											
US333	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-24.81441	-24.5512	-24.27964	-24.04769	-23.81053	-23.57945	-23.27779	-23.09269	-22.92669	-20.92669	-20.77349	-20.61814											
	HOC	-24.97555	-24.93624	-24.78449	-24.6685	-24.54365	-24.42144	-24.25241	-24.03897	-23.88397	-20.88397	-20.7349	-20.5814											
	LM(1)	7.649	7.649	7.649	7.649	7.649	7.649	7.649	7.649	7.649	7.649	7.649	7.649											
US334	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-25.16844	-24.83207	-24.53269	-24.27113	-24.05836	-23.76658	-23.46877	-23.17301	-22.84874	-22.53431	-22.23431	-21.97889											
	HOC	-25.42958	-25.21711	-25.03176	-24.89193	-24.79148	-24.63857	-24.46359	-24.27816	-24.08716	-21.42824	-21.42824	-21.42824											
	LM(1)	8.247	8.247	8.247	8.247	8.247	8.247	8.247	8.247	8.247	8.247	8.247	8.247											
US335	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-24.14885	-23.83692	-23.54389	-23.26106	-23.00909	-22.80986	-22.61408	-22.43984	-22.29484	-22.14101	-21.99261	-21.88669											
	HOC	-24.40998	-24.22106	-24.04874	-23.88276	-23.72921	-23.58188	-23.44284	-23.31284	-23.19284	-23.08284	-22.98284	-22.89284											
	LM(1)	9.033	9.033	9.033	9.033	9.033	9.033	9.033	9.033	9.033	9.033	9.033	9.033											
US401	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-36.62687	-36.19598	-35.80533	-35.39505	-34.81004	-34.45589	-34.00197	-33.47883	-32.73989	-32.37989	-32.13066	-29.28994											
	HOC	-37.1218	-36.91759	-36.74493	-36.44041	-36.15631	-35.92921	-35.72159	-35.53171	-35.37836	-35.25981	-35.17306	-32.01258											
	LM(1)	20.236	20.236	20.236	20.236	20.236	20.236	20.236	20.236	20.236	20.236	20.236	20.236											
US402	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-35.16577	-34.74334	-34.26081	-33.83464	-33.33206	-33.04815	-32.63037	-32.19038	-29.52002	-29.32002	-28.66817	-28.2486											
	HOC	-35.6589	-35.64495	-35.2002	-34.982	-34.70833	-34.58497	-34.49999	-34.45161	-34.45161	-34.45161	-34.45161	-30.63224											
	LM(1)	16.506	16.506	16.506	16.506	16.506	16.506	16.506	16.506	16.506	16.506	16.506	16.506											
US403	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-34.03008	-33.72135	-33.29827	-32.72728	-32.23846	-31.83846	-31.50697	-31.21947	-31.2188	-30.75509	-30.45394	-30.45394											
	HOC	-34.52321	-34.44296	-34.27666	-34.02014	-33.58473	-33.37528	-33.26519	-33.1147	-33.26519	-33.26519	-33.26519	-32.83758											
	LM(1)	30.655	30.655	30.655	30.655	30.655	30.655	30.655	30.655	30.655	30.655	30.655	30.655											
US404	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-35.11275	-34.86039	-34.44408	-33.97659	-33.43577	-33.04232	-32.63236	-32.2848	-32.2848	-28.72939	-28.2625												
	HOC	-35.60588	-35.582	-35.38347	-35.12395	-34.78204	-34.57914	-34.47198	-34.38003	-34.30003	-30.95621	-30.70989												
	LM(1)	33.335	33.335	33.335	33.335	33.335	33.335	33.335	33.335	33.335	33.335	33.335	33.335											
US405	Rank(k)	0	1	2	3	4	5	6	7	8	9	10	11											
	SBC	-34.75882	-34.38055	-33.9999	-33.59748	-33.08891	-32.85708	-32.51205	-32.22785	-32.22785	-28.31572	-27.9474												
	HOC	-35.25195	-35.10216	-34.9384	-34.74484	-34.53158	-34.33337	-34.23308	-34.14308	-34.05308	-30.4253	-30.33338												
	LM(1)	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44											

\*. 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 14)

Combination	Rank(s)	lags2	lags3	lags4	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12 + 2
US406	SBC	-37.87176	-37.36714	-37.01495	-36.55248	-36.06455	-35.72729	-35.25733	-34.91729	-31.66902	-31.2561	-30.70138
	HQC	-38.36489	-38.08875	-37.95435	-37.69984	-37.41082	-37.26411	-36.97696	-36.81232	-33.78317	-33.48929	-33.08502
	LB	398.448	388.922	381.212	382.138	409.614	429.577	451.301	474.127	432.481	409.449	388.442
	LM(1)	21.065	18.446	18.446	22.276	19.081	8.03	19.081	19.081	33.475	25.022	15.277
US407	SBC	-36.62913	-36.23414	-35.81662	-35.30064	-34.93682	-34.64889	-34.32356	-34.04684	-33.93953	-33.63028	-33.23587
	HQC	-37.12226	-36.95575	-36.75101	-36.4645	-36.28309	-36.18871	-36.04316	-35.94227	-35.8571	-35.61951	-35.26951
	LB	418.865	397.874	397.874	414.645	408.378	418.223	432.007	430.699	430.699	438.129	463.473
	LM(1)	33.775	14.084	17.917	29.313	29.313	14.699	18.096	21.245	21.245	14.277	10.374
US408	SBC	-37.36994	-37.07073	-36.59277	-36.18673	-35.77466	-35.39427	-34.99208	-34.49346	-31.3648	-30.93953	-30.60719
	HQC	-37.86873	-37.62823	-37.33408	-37.13292	-37.12093	-36.93109	-36.6397	-36.38869	-33.42895	-33.16635	-32.99083
	LB	406.922	439.953	426.012	418.663	417.923	404.726	413.597	438.669	438.384	430.395	436.256
	LM(1)	25.773	15.331	19.463	15.814	17.065	12.625	6.835	26.451	15.988	22.145	16.786
US409	SBC	-37.37576	-36.95122	-36.64483	-36.26634	-35.78665	-35.47759	-35.04744	-34.765	-31.35562	-30.87496	-30.4941
	HQC	-37.86873	-37.67283	-37.4137	-37.13292	-37.13292	-37.01441	-36.76706	-36.66023	-33.41976	-33.10177	-32.87774
	LB	433.893	432.357	401.099	410.718	410.12	415.853	429.163	466.875	459.587	454.933	482.552
	LM(1)	16.612	26.322	23.059	20.681	17.505	13.72	22.282	19.23	18.918	21.061	19.625
US410	SBC	-35.24587	-34.7001	-34.26932	-33.77359	-33.38077	-33.13689	-32.79143	-32.53987	-32.40452	-31.97516	-31.47871
	HQC	-35.73759	-35.42171	-35.20871	-34.92095	-34.72704	-34.6737	-34.51105	-34.46866	-34.20197	-33.86235	-33.47871
	LB	391.158	387.998	402.358	412.081	417.023	429.882	443.312	434.69	458.334	473.058	469.956
	LM(1)	20.161	21	14.165	25.602	22.162	8.276	15.102	19.23	19.23	11.395	14.102
US411	SBC	-35.94638	-35.02101	-34.59638	-34.10882	-34.10882	-33.74506	-33.33358	-32.91455	-30.07748	-29.44263	-28.98743
	HQC	-36.44151	-36.2013	-35.96041	-35.74374	-35.45509	-35.28188	-35.05543	-34.80978	-32.14163	-31.66944	-31.37107
	LB	356.76	375.392	376.979	389.531	417.182	416.727	416.727	429.969	460.284	423.416	404.209
	LM(1)	13.992	12.719	16.196	17.245	12.655	11.421	14.374	18.45	25.095	26.885	11.181
US412	SBC	-35.89697	-35.42098	-35.04886	-34.62477	-34.1003	-33.91247	-33.54585	-33.29169	-30.22186	-29.69315	-29.13868
	HQC	-36.3901	-36.14559	-35.98826	-35.77213	-35.44657	-35.44629	-35.26548	-35.18692	-32.2601	-31.81986	-31.52232
	LB	427.539	431.028	427.484	441.16	449.321	464.897	470.008	491.298	509.252	491.908	498.513
	LM(1)	12.547	18.253	16.731	12.892	19.929	13.754	18.466	7.984	19.404	26.626	20.15
US413	SBC	-34.76445	-34.55181	-34.08997	-33.65077	-33.13842	-32.89331	-32.59195	-32.25371	-31.61825	-31.25349	-31.13161
	HQC	-35.25758	-35.02837	-34.78413	-34.78413	-34.48468	-34.43013	-34.31158	-34.15094	-33.84507	-33.63913	-33.69973
	LB	418.919	404.363	409.9	419.021	415.13	422.829	419.535	440.903	481.27	438.036	450.356
	LM(1)	37.943	15.814	15.986	14.271	27.984	18.075	9.359	30.599	28.77	17.23	13.609
US414	SBC	-34.7205	-34.45979	-34.05075	-33.66884	-33.23689	-33.04838	-32.78546	-32.5016	-31.62942	-31.16942	-31.161
	HQC	-35.22363	-35.1814	-34.99015	-34.81576	-34.5852	-34.5852	-34.50008	-34.39683	-33.92084	-33.92084	-33.69973
	LB	474.328	444.541	449.443	469.057	461.409	474.185	479.502	481.317	522.152	490.538	525.612
	LM(1)	24.929	23.348	16.773	15.871	22.591	14.911	19.633	30.859	12.181	30.859	8.926
US415	SBC	-35.467	-35.1744	-34.76365	-34.42909	-34.42909	-33.97486	-33.73277	-33.39112	-33.03847	-30.05133	-29.29613
	HQC	-35.96013	-35.89601	-35.7645	-35.57645	-35.32113	-35.32113	-35.26959	-34.9337	-34.9337	-34.9337	-34.9337
	LB	422.885	428.74	415.899	441.871	441.871	447.867	460.648	444.718	482.412	529.638	460.266
	LM(1)	19.999	20.59	10.462	19.462	16.261	15.118	14.884	16.638	15.196	27.339	32.992

\*: 5% of upper and lower tail



Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 15)

Combination	Rank(1)	Rank(2)	Rank(3)	Rank(4)	Rank(5)	Rank(6)	Rank(7)	Rank(8)	Rank(9)	Rank(10)	Rank(11)	Rank(12)	Rank(13)	Rank(14)
US416	SBC	-33.68809	-33.17408	-32.77554	-32.47759	-31.80999	-31.44199	-31.01392	-30.59054	-27.2641	-27.2641	-26.95545		
	HOC	-34.18122	-33.89569	-33.71494	-33.52495	-33.15626	-32.97881	-32.73354	-32.45377	-29.23824	-29.23824	-29.18226		
	LB	334.681	346.949	362.48	373.286	382.973	393.528	401.6	411.133	451.133	347.547	347.547	389.788	0.21
	LM(1)	14.997	14.997	11.083	16.887	10.075	10.136	0.86	5.944	20.36	22.654	22.654	6.892	0.98
US417	SBC	-32.67639	-32.24867	-31.80361	-31.32475	-30.87461	-30.46801	-30.10657	-29.78275	-29.4466	-29.4466	-29.11477		
	HOC	-33.16952	-32.97028	-32.74301	-32.47211	-32.22088	-31.82019	-31.65781	-31.45798	-29.60045	-29.60045	-31.49841		
	LB	361.892	345.417	364.518	380.577	380.577	388.461	412.265	417.514	447.733	447.733	447.733	503.773	0.00
	LM(1)	20.998	17.996	15.654	22.91	9.159	12.055	0.74	5.89	31.482	21.614	21.614	10.351	0.85
US418	SBC	-33.74579	-33.32521	-32.97642	-32.52729	-32.06619	-31.65132	-31.17455	-30.79254	-29.60045	-29.60045	-26.73072		
	HOC	-34.23892	-34.04682	-33.591582	-33.67525	-33.41246	-33.18814	-32.89417	-32.68778	-29.60045	-29.60045	-29.11436		
	LB	362.675	371.54	381.727	379.93	384.25	385.024	401.218	442.617	442.617	377.364	377.364	384.005	0.27
	LM(1)	19.844	20.29	11.33	11.33	13.512	13.512	0.63	7.811	20.243	18.505	18.505	13.393	0.64
US419	SBC	-31.40029	-32.96058	-32.64299	-32.32984	-31.84112	-31.48877	-31.0441	-30.65046	-27.18387	-27.18387	-26.0441		
	HOC	-33.89342	-33.68219	-33.58238	-33.4576	-33.18739	-33.02659	-32.63732	-32.4569	-29.24802	-29.24802	-28.80775		
	LB	375.237	389.543	413.05	411.484	417.021	415.165	441.915	471.407	394.922	394.922	425.759	0.02	
	LM(1)	12.943	23.55	12.91	16.782	15.855	8.691	17.47	19.921	14.248	14.248	15.952	0.46	
US420	SBC	-31.7044	-30.67025	-30.21155	-29.75456	-29.30541	-28.95659	-28.61108	-28.25761	-28.04828	-27.71861	-27.5004		
	HOC	-31.66538	-31.39186	-31.155	-30.90192	-30.65168	-30.49341	-30.33071	-30.15384	-30.14842	-29.94542	-29.4368		
	LB	349.897	352.694	375.71	382.579	405.567	418.42	430	440.691	440.691	489.417	489.417	486.986	0.00
	LM(1)	18.014	0.32	8.961	8.961	16.234	16.234	0.44	7.626	21.515	21.515	22.626	0.12	
US421	SBC	-32.17232	-31.70171	-31.23927	-30.76656	-30.30654	-29.9255	-29.5255	-29.22114	-29.0876	-29.0876	-25.58213		
	HOC	-32.66545	-32.42332	-32.17866	-31.91372	-31.65681	-31.46232	-31.2876	-30.92884	-30.86876	-30.86876	-27.80894		
	LB	334.139	339.916	367.661	377.967	377.967	407.162	408	428.736	456.03	481.127	443.135	360.828	0.60
	LM(1)	16.421	9.415	11.135	13.328	13.328	12.237	9.314	9.90	11.906	16.742	16.742	31.632	0.01
US422	SBC	-31.77322	-31.34458	-30.97517	-30.59314	-30.03963	-29.57631	-29.37631	-28.97561	-26.00261	-26.00261	-25.13667		
	HOC	-32.26635	-32.06619	-31.83859	-31.74049	-31.38519	-31.09594	-30.87084	-30.87084	-28.06676	-28.06676	-27.61312		
	LB	383.269	413.401	429.376	423.512	430.147	436.211	459.248	476.77	476.77	475.025	439.758	444.17	0.00
	LM(1)	15.864	0.46	12.477	12.477	12.392	12.392	0.88	9.769	16.563	23.762	22.172	10.075	0.86
US423	SBC	-31.1418	-30.84807	-30.48971	-29.98212	-29.98212	-29.66404	-29.4284	-28.69346	-28.39438	-28.39438	-27.89066		
	HOC	-31.63493	-31.49211	-31.29211	-31.13048	-30.97966	-30.81081	-30.57966	-30.1308	-30.1308	-30.1308	-30.11747		
	LB	384.42	371.993	380.342	403.799	403.799	408.653	408.653	410.783	410.783	425.765	396.229	0.15	
	LM(1)	26.491	16.543	10.669	14.609	14.609	7.546	10.765	13.989	17.986	20.712	21.627	0.06	
US424	SBC	-30.80163	-30.49312	-30.05447	-29.72553	-29.288	-28.90661	-28.7239	-28.27129	-28.08317	-28.08317	-27.65276		
	HOC	-31.21473	-30.99387	-30.87288	-30.63426	-30.43493	-30.29201	-30.29201	-30.16652	-30.10251	-30.10251	-29.79757		
	LB	431.544	450.582	445.679	451.525	460.967	468.086	490.824	485.454	485.454	487.332	482.169	510.615	0.00
	LM(1)	25.243	8.485	23.019	14.531	8.924	13.427	16.64	27.196	35.03	35.03	16.419	8.018	0.95
US425	SBC	-31.85998	-31.51215	-31.17077	-30.82671	-30.82671	-30.28746	-29.95766	-29.6011	-29.38923	-29.38923	-26.23426		
	HOC	-32.33311	-32.23376	-32.11017	-31.97407	-31.97407	-31.49448	-31.18446	-31.18446	-31.18446	-31.18446	-29.7237		
	LB	398.794	407.322	419.515	451.648	451.648	468.721	468.721	488.054	502.876	502.876	491.132	377.783	0.35
	LM(1)	19.543	15.611	15.305	15.305	15.305	14.802	13.842	13.221	13.221	20.511	20.511	25.524	0.06

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 16)

Combination	Rank(1)	lags1	lags0	lags5	lags6	lags7	lags8	lags9	lags10	lags11	lags12	lags13	lags14	lags15
<b>US426</b>	SBC	-33.81217	-32.52229	-32.30839	-31.98142	-31.67108	-31.34359	-31.00910	-30.89644	-30.62474	-30.52474	-30.89644	-30.89644	-36.77369
	HOC	-34.4033	-33.83438	-33.45575	-33.13279	-32.80729	-32.48179	-32.15629	-31.83079	-31.71813	-31.44643	-31.22473	-31.00303	-30.03496
	LB	332.341	337.093	338.114	338.052	338.052	338.052	338.052	338.052	338.052	338.052	338.052	338.052	460.025
	LM(1)	25.375	31.023	31.023	31.023	31.023	31.023	31.023	31.023	31.023	31.023	31.023	31.023	17.418
<b>US427</b>	SBC	-34.50107	-33.97949	-33.10152	-32.67122	-32.25058	-31.84607	-31.45346	-31.23481	-27.8241	-27.8241	-27.8241	-27.8241	-27.33983
	HOC	-34.9942	-34.69631	-34.39840	-34.10049	-33.80257	-33.50466	-33.20674	-32.90882	-32.61090	-32.31298	-32.01506	-31.71714	-30.82249
	LB	341.022	339.786	338.550	337.314	336.078	334.842	333.606	332.370	331.134	329.898	328.662	327.426	387.874
	LM(1)	14.423	17.488	19.033	21.146	23.259	25.372	27.485	29.598	31.711	33.824	35.937	38.050	43.881
<b>US428</b>	SBC	-34.44202	-33.9448	-33.22086	-32.78705	-32.45324	-32.11943	-31.78562	-31.45181	-31.11799	-30.78418	-30.45037	-30.11656	-29.89847
	HOC	-34.95115	-34.66641	-34.38166	-34.09691	-33.81216	-33.52741	-33.24266	-32.95791	-32.67316	-32.38841	-32.10366	-31.81891	-31.53416
	LB	362.311	376.215	373.092	370.969	368.846	366.723	364.600	362.477	360.354	358.231	356.108	353.985	384.795
	LM(1)	13.429	24.757	23.966	23.175	22.384	21.593	20.802	20.011	19.220	18.429	17.638	16.847	29.484
<b>US429</b>	SBC	-33.47253	-33.11857	-32.23613	-31.81732	-31.50293	-31.18854	-30.87415	-30.69377	-30.36938	-30.26889	-30.16840	-30.06791	-29.91463
	HOC	-33.96566	-33.84018	-33.63849	-33.43680	-33.23511	-33.03342	-32.83173	-32.63004	-32.42835	-32.22666	-32.02497	-31.82328	-31.82328
	LB	381.545	372.004	373.945	374.402	374.859	375.316	375.773	376.230	376.687	377.144	377.601	378.058	448.929
	LM(1)	31.871	17.488	23.803	21.939	20.075	18.211	16.347	14.483	12.619	10.755	8.891	7.027	15.184
<b>US430</b>	SBC	-33.38406	-33.02273	-32.33125	-31.98218	-31.63311	-31.28404	-30.93497	-30.68590	-30.33683	-30.23634	-30.13585	-30.03536	-29.98815
	HOC	-33.87719	-33.74434	-33.59437	-33.32845	-33.11115	-32.89385	-32.67655	-32.45925	-32.24195	-32.02465	-31.80735	-31.59005	-31.59005
	LB	386.862	375.834	375.834	374.402	373.959	373.516	373.073	372.630	372.187	371.744	371.301	370.858	507.041
	LM(1)	21.67	15.642	15.642	15.642	15.642	15.642	15.642	15.642	15.642	15.642	15.642	15.642	15.474
<b>US431</b>	SBC	-34.19622	-33.81048	-33.21912	-32.81732	-32.47407	-32.13082	-31.78757	-31.6215	-27.73662	-27.73662	-27.73662	-27.73662	-27.33729
	HOC	-34.68935	-34.53209	-34.37483	-34.1566	-33.9384	-33.7202	-33.5020	-33.2838	-33.0656	-32.8474	-32.6292	-32.4110	-32.4110
	LB	373.951	391.717	391.717	386.163	382.609	379.055	375.501	371.947	368.393	364.839	361.285	357.731	423.012
	LM(1)	21.414	23.518	23.518	23.518	23.518	23.518	23.518	23.518	23.518	23.518	23.518	23.518	11.601
<b>US432</b>	SBC	-31.95034	-31.39171	-30.47377	-30.04456	-29.74057	-29.38918	-29.10988	-28.99403	-28.46006	-28.46006	-28.46006	-28.46006	-28.07346
	HOC	-32.44347	-32.12739	-31.62113	-31.27739	-30.93363	-30.58987	-30.24611	-29.90235	-29.55859	-29.21483	-28.87107	-28.52731	-28.07346
	LB	340.614	340.211	370.272	370.272	402.608	402.608	402.608	402.608	402.608	402.608	402.608	402.608	452.993
	LM(1)	15.883	17.199	17.199	17.199	17.199	17.199	17.199	17.199	17.199	17.199	17.199	17.199	12.744
<b>US433</b>	SBC	-31.85416	-31.40318	-30.68147	-30.30086	-30.16666	-29.78154	-29.50601	-29.12978	-28.82049	-28.82049	-28.82049	-28.82049	-28.29112
	HOC	-32.34729	-32.12479	-31.62348	-31.28113	-30.93878	-30.59643	-30.25408	-29.91173	-29.56938	-29.22703	-28.88468	-28.54233	-28.07346
	LB	389.451	406.669	420.595	415.48	440.639	445.21	449.782	454.355	458.928	463.501	468.074	472.647	472.647
	LM(1)	15.771	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	18.17
<b>US434</b>	SBC	-32.56176	-32.10063	-31.31899	-30.80126	-30.50558	-30.13919	-29.81005	-29.59954	-26.23396	-26.23396	-26.23396	-26.23396	-25.86352
	HOC	-33.05489	-32.82224	-32.46635	-32.14753	-31.82871	-31.50989	-31.19107	-30.87225	-30.55343	-30.23461	-29.91579	-29.59704	-28.2716
	LB	369.385	386.475	402.762	427.963	430.838	446.81	462.782	478.754	494.726	510.698	526.670	542.642	403.058
	LM(1)	12.415	15.042	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	16.111	20.048
<b>US435</b>	SBC	-31.32258	-31.28764	-30.57004	-30.14643	-29.92348	-29.63264	-29.34180	-29.05096	-28.76012	-28.76012	-28.76012	-28.76012	-28.2612
	HOC	-32.01571	-32.06923	-31.7174	-31.4603	-31.2032	-30.9461	-30.6890	-30.4319	-30.1748	-29.9177	-29.6606	-29.4035	-30.60762
	LB	418.397	396.788	418.397	418.397	418.397	418.397	418.397	418.397	418.397	418.397	418.397	418.397	478.089
	LM(1)	29.427	16.592	16.592	16.592	16.592	16.592	16.592	16.592	16.592	16.592	16.592	16.592	12.207

\*, 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis-p value (Continued: 17)

Combination	Ranks		Iags3		Iags4		Iags5		Iags6		Iags7		Iags8		Iags9		Iags10		Iags11		Iags12			
	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)	Rank(1)	Rank(2)		
US501	SBC	-43.43879	-42.24787	-41.54082	-41.05229	-40.21108	-39.7381	-42.24787	-41.05229	-40.21108	-39.7381	-42.24787	-41.05229	-40.21108	-39.7381	-42.24787	-41.05229	-40.21108	-39.7381	-42.24787	-41.05229	-40.21108	-39.7381	
	HOC	-44.2618	-43.7889	-43.40866	-43.22845	-42.90678	-42.50242	-42.90678	-43.22845	-42.90678	-42.50242	-42.90678	-43.22845	-42.90678	-42.50242	-42.90678	-43.22845	-42.90678	-42.50242	-42.90678	-43.22845	-42.90678	-42.50242	-42.90678
	LB	555.794	561.083	598.168	598.323	623.882	623.882	598.168	598.323	623.882	623.882	598.168	598.323	623.882	623.882	598.168	598.323	623.882	623.882	598.168	598.323	623.882	623.882	598.168
	LM(1)	44.323	44.323	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848	20.848
US502	SBC	-46.25645	-44.91625	-44.27444	-43.7996	-43.0987	-42.58626	-43.7996	-43.0987	-42.58626	-43.7996	-43.0987	-42.58626	-43.7996	-43.0987	-42.58626	-43.7996	-43.0987	-42.58626	-43.7996	-43.0987	-42.58626	-43.7996	
	HOC	-47.07946	-46.45728	-46.14228	-45.97576	-45.56049	-45.33058	-45.97576	-45.56049	-45.33058	-45.97576	-45.56049	-45.33058	-45.97576	-45.56049	-45.33058	-45.97576	-45.56049	-45.33058	-45.97576	-45.56049	-45.33058	-45.97576	
	LB	3531.18	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	3511.53	3496.32	
	LM(1)	43.327	31.496	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	27.83	
US503	SBC	-45.56099	-44.18561	-43.7232	-42.94444	-41.44701	-40.92668	-44.18561	-43.7232	-42.94444	-41.44701	-40.92668	-44.18561	-43.7232	-42.94444	-41.44701	-40.92668	-44.18561	-43.7232	-42.94444	-41.44701	-40.92668	-44.18561	
	HOC	-45.02786	-44.14579	-44.72684	-44.44037	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	
	LB	3165.76	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	
	LM(1)	24.252	26.513	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	21.918	
US504	SBC	-44.80485	-43.9922	-43.18561	-42.3732	-41.44701	-40.92668	-43.9922	-43.18561	-42.3732	-41.44701	-40.92668	-43.9922	-43.18561	-42.3732	-41.44701	-40.92668	-43.9922	-43.18561	-42.3732	-41.44701	-40.92668	-43.9922	
	HOC	-45.02786	-44.14579	-44.72684	-44.44037	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	-43.91979	-43.671	-44.14579	
	LB	3165.76	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	3062.86	3054.24	
	LM(1)	28.277	30.296	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	28.748	
US505	SBC	-43.56315	-42.99373	-42.56172	-41.11023	-40.51219	-40.03075	-42.99373	-42.56172	-41.11023	-40.51219	-40.03075	-42.99373	-42.56172	-41.11023	-40.51219	-40.03075	-42.99373	-42.56172	-41.11023	-40.51219	-40.03075	-42.99373	
	HOC	-44.38617	-44.18732	-44.18732	-44.06028	-43.28639	-42.75707	-44.18732	-44.06028	-43.28639	-42.75707	-44.18732	-44.06028	-43.28639	-42.75707	-44.18732	-44.06028	-43.28639	-42.75707	-44.18732	-44.06028	-43.28639	-42.75707	
	LB	583.671	581.212	596.525	596.525	612.993	612.993	583.671	581.212	596.525	596.525	612.993	612.993	583.671	581.212	596.525	596.525	612.993	612.993	583.671	581.212	596.525	596.525	
	LM(1)	51.998	27.082	35.5	35.5	31.788	31.788	51.998	27.082	35.5	35.5	31.788	31.788	51.998	27.082	35.5	35.5	31.788	31.788	51.998	27.082	35.5	35.5	
US506	SBC	-44.19447	-43.7238	-42.95629	-42.3763	-41.8909	-41.6565	-43.7238	-42.95629	-42.3763	-41.8909	-41.6565	-43.7238	-42.95629	-42.3763	-41.8909	-41.6565	-43.7238	-42.95629	-42.3763	-41.8909	-41.6565	-43.7238	
	HOC	-45.01748	-44.91939	-44.49733	-44.05706	-43.63344	-43.48983	-45.01748	-44.91939	-44.49733	-44.05706	-43.63344	-43.48983	-45.01748	-44.91939	-44.49733	-44.05706	-43.63344	-43.48983	-45.01748	-44.91939	-44.49733	-44.05706	
	LB	526.721	548.39	582.849	596.427	628.851	628.851	526.721	548.39	582.849	596.427	628.851	628.851	526.721	548.39	582.849	596.427	628.851	628.851	526.721	548.39	582.849	596.427	
	LM(1)	44.751	22.67	32.619	32.619	29.856	29.856	44.751	22.67	32.619	32.619	29.856	29.856	44.751	22.67	32.619	32.619	29.856	29.856	44.751	22.67	32.619	32.619	
US507	SBC	-44.99712	-43.6029	-42.7793	-41.80731	-41.38769	-40.92848	-43.6029	-42.7793	-41.80731	-41.38769	-40.92848	-43.6029	-42.7793	-41.80731	-41.38769	-40.92848	-43.6029	-42.7793	-41.80731	-41.38769	-40.92848	-43.6029	
	HOC	-45.2013	-44.85649	-44.4578	-43.98347	-43.75547	-43.6728	-45.2013	-44.85649	-44.4578	-43.98347	-43.75547	-43.6728	-45.2013	-44.85649	-44.4578	-43.98347	-43.75547	-43.6728	-45.2013	-44.85649	-44.4578	-43.98347	
	LB	591.479	589.545	587.589	596.207	623.137	623.137	591.479	589.545	587.589	596.207	623.137	623.137	591.479	589.545	587.589	596.207	623.137	623.137	591.479	589.545	587.589	596.207	
	LM(1)	43.568	29.377	31.623	31.623	24.073	24.073	43.568	29.377	31.623	31.623	24.073	24.073	43.568	29.377	31.623	31.623	24.073	24.073	43.568	29.377	31.623	31.623	
US508	SBC	-42.07401	-41.33167	-40.07037	-39.57805	-38.82081	-38.27429	-41.33167	-40.07037	-39.57805	-38.82081	-38.27429	-41.33167	-40.07037	-39.57805	-38.82081	-38.27429	-41.33167	-40.07037	-39.57805	-38.82081	-38.27429	-41.33167	
	HOC	-42.89702	-42.53226	-42.28073	-41.93822	-41.75942	-41.59621	-42.89702	-42.53226	-42.28073	-41.93822	-41.75942	-41.59621	-42.89702	-42.53226	-42.28073	-41.93822	-41.75942	-41.59621	-42.89702	-42.53226	-42.28073	-41.93822	
	LB	498.215	532.846	535.063	535.063	578.398	578.398	498.215	532.846	535.063	535.063	578.398	578.398	498.215	532.846	535.063	535.063	578.398	578.398	498.215	532.846	535.063	535.063	
	LM(1)	55.699	29.11	24.174	24.174	21.336	21.336	55.699	29.11	24.174	24.174	21.336	21.336	55.699	29.11	24.174	24.174	21.336	21.336	55.699	29.11	24.174	24.174	
US509	SBC	-40.51226	-39.64926	-38.30462	-37.73825	-37.01014	-36.53725	-39.64926	-38.30462	-37.73825	-37.01014	-36.53725	-39.64926	-38.30462	-37.73825	-37.01014	-36.53725	-39.64926	-38.30462	-37.73825	-37.01014	-36.53725	-39.64926	
	HOC	-41.33328	-40.84285	-40.17246	-39.9144	-39.47793	-39.28157	-41.33328	-40.84285	-40.17246	-39.9144	-39.47793	-39.28157	-41.33328	-40.84285	-40.17246	-39.9144	-39.47793	-39.28157	-41.33328	-40.84285	-40.17246	-39.9144	
	LB	477.679	494.619	537.154	537.154	565.429	565.429	477.679	494.619	537.154	537.154	565.429	565.429	477.679	494.619	537.154	537.154	565.429	565.429	477.679	494.619	537.154	537.154	
	LM(1)	32.693	24.174	22.248	22.248	17.763	17.763	32.693	24.174	22.248	22.248	17.763	17.763	32.693	24.174	22.248	22.248	17.763	17.763	32.693	24.174	22.248	22.248	
US510	SBC	-39.42087	-38.85281	-37.53582	-36.99446	-36.14812	-35.63191	-38.85281	-38.07127	-37.53582	-36.99446	-36.14812	-35.63191	-38.85281	-38.07127	-37.53582	-36.99446	-36.14812	-35.63191	-38.85281	-38.07127	-37.53582	-36.99446	
	HOC	-40.50035	-40.04664	-40.04664	-39.70027	-38.6191	-38.37623	-40.50035	-40.04664	-40.04664	-39.70027	-38.6191	-38.37623	-40.50035	-40.04664	-40.04664	-39.70027	-38.6191	-38.37623	-40.50035	-40.04664	-40.04664	-39.70027	
	LB	505.848	533.209	574.193	574.193	647.099	647.099	505.848	533.209	574.193	574.193	647.099	647.099	505.848	533.209	574.193	574.193	647.099	647					

**Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 18)**

Combination	Rank(s)	lags <sup>2</sup>	lags <sup>3</sup>	lags <sup>4</sup>	lags <sup>5</sup>	lags <sup>6</sup>	lags <sup>7</sup>	lags <sup>8</sup>	lags <sup>9</sup>	lags <sup>10</sup>	lags <sup>11</sup>	lags <sup>12</sup>	f <sub>2</sub>
USS11	SBC	-40.18383	-39.44502	-38.90426	-38.39428	-37.77529	-37.21523	-36.73717	-36.31443	-33.45497	-32.42335	-31.76895	0.00
	HQC	-41.00684	-40.63862	-40.20212	-39.93429	-39.59144	-39.36031	-39.20149	-39.03215	-36.71237	-35.91955	-35.51039	0.00
	LB	537.0007	555.018	612.988	622.943	659.353	670.536	683.452	703.559	760.055	813.911	860.055	0.00
	LM(1)	53.94	36.269	31.288	19.458	0.77	27.91	32.622	21.448	0.35	140.818	24.229	0.51
	LM(4)	25.94	29.069	21.028	24.556	0.49	26.744	31.429	0.22	46.057	30.776	0.20	19.21
USS12	SBC	-43.32258	-42.44606	-41.81762	-41.0841	-40.64109	-39.90623	-39.35626	-38.88795	-35.73608	-34.96704	-34.20497	0.00
	HQC	-44.14559	-43.65965	-42.95195	-42.81724	-42.1704	-41.84508	-41.84508	-41.84508	-38.99348	-38.46523	-37.92941	0.00
	LB	469.322	503.962	527.064	538.771	569.463	626.873	635.257	675.851	695.5	724.113	756.529	0.00
	LM(1)	34.727	37.419	30.529	26.794	0.44	21.307	22.502	18.529	0.82	107.033	22.941	0.38
	LM(4)	20.179	21.615	24.28	31.771	0.16	30.958	21.492	0.66	16.253	37.015	24.831	0.47
USS13	SBC	-42.19693	-41.52935	-40.81598	-40.14066	-39.67549	-39.02711	-38.49392	-38.06473	-38.0081	-37.56277	-37.01121	0.00
	HQC	-43.01895	-42.72294	-42.35701	-42.0085	-41.85164	-41.4949	-41.23824	-41.07186	-41.03586	-41.03586	-40.73565	0.00
	LB	522.791	521.226	541.74	545.692	581.799	614.851	633.65	643.872	643.872	724.113	756.529	0.00
	LM(1)	79.108	26.57	30.481	29.885	0.23	24.986	21.076	0.69	22.132	20.186	19.129	0.79
	LM(4)	38.037	31.134	25.134	22.531	0.45	32.8	25.681	0.42	19.829	12.811	18.516	0.82
USS14	SBC	-42.9152	-42.123	-41.5627	-41.0386	-40.58835	-39.83078	-39.22599	-38.5644	-35.65011	-34.73041	-34.26609	0.00
	HQC	-43.73453	-43.3059	-43.10374	-42.90171	-42.76645	-42.31556	-41.97031	-41.57152	-38.90751	-38.2266	-37.99053	0.00
	LB	503.756	537.804	590.076	570.814	610.024	612.42	591.781	633.393	633.393	702.664	684.945	0.00
	LM(1)	55.724	26.471	30.849	29.885	0.23	24.986	21.076	0.69	22.132	20.186	19.129	0.79
	LM(4)	31.505	35.321	31.385	22.531	0.62	30.653	20.079	0.74	31.998	18.882	21.746	0.32
USS15	SBC	-42.92193	-42.10612	-41.54554	-41.08915	-40.58808	-39.83078	-39.22599	-38.5644	-35.65011	-34.73041	-34.26609	0.00
	HQC	-43.74494	-43.30657	-43.10374	-42.90171	-42.76645	-42.31556	-41.97031	-41.57152	-38.90751	-38.2266	-37.99053	0.00
	LB	515.039	528.412	549.298	562.495	602.01	612.42	591.781	633.393	633.393	702.664	684.945	0.00
	LM(1)	54.231	36.622	30.536	29.885	0.23	24.986	21.076	0.69	22.132	20.186	19.129	0.79
	LM(4)	34.347	31.419	27.565	22.531	0.33	30.653	20.079	0.74	31.998	18.882	21.746	0.32
USS16	SBC	-40.67946	-39.80284	-39.13044	-38.32193	-37.838	-37.27381	-36.76997	-36.32722	-36.2484	-35.88181	-35.03939	0.00
	HQC	-41.50248	-40.99643	-40.67148	-40.18978	-40.01415	-39.74159	-39.51429	-39.33433	-39.50579	-39.578	-38.76383	0.00
	LB	505.737	522.995	536.206	550.261	0.22	572.511	666.492	666.492	666.492	699.849	757.282	0.00
	LM(1)	43.799	36.044	19.164	20.363	0.73	23.616	17.174	0.88	32.695	26.368	28.081	0.30
	LM(4)	21.925	16.605	16.081	23.64	0.54	20.46	19.186	0.79	25.865	16.882	24.18	0.51
USS17	SBC	-41.41993	-40.51236	-39.67903	-39.02666	-38.53658	-37.78958	-37.28581	-36.70766	-34.12337	-33.18946	-32.42019	0.00
	HQC	-42.24295	-41.70595	-41.22007	-40.90451	-40.71273	-40.25736	-40.00283	-39.74178	-37.38277	-36.68565	-36.14463	0.00
	LB	477.069	496.482	516.31	555.627	592.174	629.959	629.959	629.959	688.668	727.342	757.282	0.00
	LM(1)	30.391	26.436	24.594	18.879	0.80	21.334	13.478	0.97	35.705	23.14	21.671	0.65
	LM(4)	24.065	23.72	27.73	21.841	0.64	17.611	17.628	0.45	22.02	29.016	24.188	0.32
USS18	SBC	-41.34353	-40.41333	-39.77212	-39.14493	-38.61161	-38.03879	-37.63297	-37.16027	-34.34028	-33.58345	-32.81107	0.00
	HQC	-42.16834	-41.60692	-41.131315	-40.73728	-40.50657	-40.16739	-39.9768	-39.59768	-37.59768	-37.07964	-36.52514	0.00
	LB	542.892	542.892	531.953	583.919	0.04	612.815	671.073	671.073	716.006	795.749	755.048	0.00
	LM(1)	24.598	36.882	23.658	23.011	0.58	26.988	20.399	0.73	15.305	35.596	26.65	0.37
	LM(4)	22.392	22.543	22.356	18.889	0.80	24.41	31.438	0.17	18.59	33.764	27.192	0.35
USS19	SBC	-40.26881	-39.75138	-39.01288	-38.53282	-37.87021	-37.29453	-36.73193	-36.291	-36.14407	-35.57385	-34.54067	0.00
	HQC	-41.09182	-40.53592	-40.35392	-40.21066	-40.06637	-39.76232	-38.47655	-38.291	-39.40147	-39.07004	-35.0114	0.00
	LB	532.149	508.501	551.676	572.828	0.07	599.806	637.185	637.185	654.348	703.507	745.553	0.00
	LM(1)	72.829	26.339	26.397	21.443	0.67	35.168	17.34	0.87	47.316	31.227	34.717	0.09
	LM(4)	25.563	25.643	22.202	28.001	0.31	23.865	15.589	0.92	24.002	22.654	22.654	0.60
USS20	SBC	-40.14757	-39.58291	-39.0473	-38.50347	-37.8873	-37.46467	-37.00613	-36.59496	-36.29617	-35.9654	-35.24965	0.00
	HQC	-40.97058	-40.7765	-40.58833	-40.37131	-40.06346	-39.93246	-39.75045	-39.69208	-39.5537	-39.46159	-38.97409	0.00
	LB	589.489	561.72	581.319	594.17	0.02	620.727	661.285	661.285	696.514	724.737	756.529	0.00
	LM(1)	71.65	37.935	37.452	32.338	0.56	27.722	26.878	0.37	26.878	45.215	26.444	0.38
	LM(4)	35.655	27.683	26.401	35.681	0.08	31.606	26.964	0.36	23.604	12.759	18.905	0.80

\*: 5% of upper and lower tail

Table 1: Maximum number of ranks, 2 information criteria, and Residual Analysis: p-value (Continued: 19)

Combination	Rank(1)	Rank(2)	Rank(3)	Rank(4)	Rank(5)	Rank(6)	Rank(7)	Rank(8)	Rank(9)	Rank(10)	Rank(11)	Rank(12)
US521	SBC	-41.07761	-39.64192	-39.27441	-38.23131	-37.74742	-37.23131	-36.46988	-35.41019	-34.68009	-33.41019	-32.68009
	HQC	-41.90062	-41.18226	-41.18226	-40.69911	-40.49174	-40.23712	-39.90638	-38.90638	-37.60537	-36.40537	-35.20537
	LB	517.996	562.731	582.921	622.32	664.303	687.916	754.569	787.85	740.637	703.57	674.037
	LM(1)	50.635	29.849	34.092	31.936	25.83	20.284	14.043	106.047	30.786	21.973	0.64
US601	Rank(1)	23.746	25.559	26.311	26.311	17.962	14.857	14.586	19.238	46.247	37.541	30.2
	SBC	-52.97126	-50.96968	-50.02913	-49.25417	-48.78611	-48.39447	-48.00038	-47.39447	-46.66954	-45.39447	-44.66954
	HQC	-54.24572	-53.30774	-52.83846	-52.50142	-51.88992	-51.73984	-51.58866	-51.38866	-50.84545	-50.30224	-49.75903
	LB	720.299	728.395	779.326	786.419	840.067	878.735	930.924	970.67	1130.782	1153.994	1185.34
US602	Rank(1)	46.1	34.569	36.198	36.198	46.1	46.1	37.85	47.218	35.529	43.7	39.804
	SBC	-48.94963	-48.16382	-45.07581	-44.33091	-43.30914	-42.74933	-42.50935	-42.50935	-42.50935	-42.50935	-42.50935
	HQC	-50.22409	-49.99233	-48.98799	-48.039	-47.34795	-47.14804	-46.94808	-46.64851	-46.44851	-46.24851	-46.04851
	LB	683.765	684.215	733.585	733.585	818.228	866.079	901.011	931.709	1002.458	1062.458	1118.665
US603	Rank(1)	31.1	33.31	31.746	31.746	41.231	24.89	22.577	54.653	20.324	20.324	23.191
	SBC	-51.85106	-50.90843	-48.65358	-47.81606	-47.27352	-46.27446	-45.66015	-45.39447	-45.39447	-45.39447	-45.39447
	HQC	-53.12552	-52.73693	-51.46291	-50.92946	-50.31327	-50.05887	-49.94808	-49.84808	-49.64851	-49.54851	-49.44851
	LB	676.426	691.09	744.305	744.305	843.877	896.053	906.053	931.709	1081.959	1092.458	1118.665
US604	Rank(1)	39.74	34.697	39.444	39.444	39.74	39.74	38.971	36.597	46.801	33.348	31.8
	SBC	-50.1469	-49.00226	-46.66849	-45.66849	-44.27088	-43.7088	-43.30253	-43.30253	-43.30253	-43.30253	-43.30253
	HQC	-51.42136	-50.83077	-49.47448	-48.91574	-48.84046	-48.30969	-48.04061	-47.83259	-47.83259	-47.83259	-47.83259
	LB	683.352	685.063	746.954	746.954	857.856	887.136	942.136	1006.813	1136.302	1109.712	1110.833
US605	Rank(1)	43.515	42.202	33.485	33.485	43.515	32.356	32.356	41.987	32.356	32.356	36.297
	SBC	-48.95797	-48.41876	-46.07663	-45.13372	-44.67958	-44.27088	-43.69215	-43.08551	-42.80478	-42.80478	-42.80478
	HQC	-50.23242	-50.24727	-48.88596	-48.38096	-47.73096	-47.42716	-47.23096	-47.23096	-47.23096	-47.23096	-47.23096
	LB	707.568	697.752	760.455	824.406	890.29	943.3	943.3	66.789	1011.535	1111.944	1154.693
US606	Rank(1)	38.649	36.882	32.709	32.709	32.709	32.709	29.765	29.765	29.765	29.765	29.765
	SBC	-49.06101	-48.06101	-46.61827	-45.82996	-44.3787	-44.3787	-43.73787	-43.49128	-43.49128	-43.49128	-43.49128
	HQC	-51.00538	-50.89952	-49.4276	-49.02928	-48.72721	-48.57668	-48.2937	-48.2937	-48.2937	-48.2937	-48.2937
	LB	698.662	678.835	736.19	827.85	870.322	917.45	917.45	938.718	1074.105	1068.501	1124.539
US607	Rank(1)	41.93	35.327	35.905	35.905	41.93	35.905	35.905	47.415	35.905	35.905	35.905
	SBC	-49.88287	-49.073	-47.66604	-45.98203	-44.6339	-44.6339	-44.6339	-44.14828	-43.9829	-43.9829	-43.9829
	HQC	-51.15733	-50.9015	-49.34411	-49.22928	-48.02721	-48.02721	-48.02721	-48.02721	-48.02721	-48.02721	-48.02721
	LB	722.851	715.795	740.215	834.505	874.41	925.137	925.137	970.707	1083.104	1137.087	1183.312
US701	Rank(1)	41.93	35.327	35.905	35.905	41.93	35.905	35.905	47.415	35.905	35.905	35.905
	SBC	-58.62066	-57.11364	-55.56425	-52.19536	-51.35529	-51.35529	-51.35529	-50.464	-50.07755	-46.60443	-45.63079
	HQC	-60.50183	-59.77712	-58.93118	-57.5065	-56.97734	-56.97734	-56.97734	-56.4789	-56.32395	-53.23295	-52.93069
	LB	810.906	844.066	947.696	1044.34	1105.94	1220.592	1347.709	1547.709	1596.305	1634.342	1634.342

\*: 5% of upper and lower tail

1. Combination

CB/US301 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US302 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US303 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US304 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US305 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US306 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US307 : Singapore + Indonesia + The Philippines  
CB/US308 : Korea + Malaysia + The Philippines  
CB/US309 : Singapore + Malaysia + The Philippines  
CB/US310 : Indonesia + Malaysia + The Philippines  
CB/US311 : Korea + Singapore + Thailand  
CB/US312 : Korea + Indonesia + Thailand  
CB/US313 : Singapore + Indonesia + Thailand  
CB/US314 : Korea + Malaysia + Thailand  
CB/US315 : Singapore + Malaysia + Thailand  
CB/US316 : Indonesia + Malaysia + Thailand  
CB/US317 : Korea + The Philippines + Thailand  
CB/US318 : Singapore + The Philippines + Thailand  
CB/US319 : Indonesia + The Philippines + Thailand  
CB/US320 : Malaysia + The Philippines + Thailand  
CB/US321 : The Philippines + Thailand + China  
CB/US322 : Malaysia + Thailand + China  
CB/US323 : Indonesia + Thailand + China  
CB/US324 : Singapore + Thailand + China  
CB/US325 : Korea + Thailand + China  
CB/US326 : Malaysia + The Philippines + China  
CB/US327 : Indonesia + The Philippines + China  
CB/US328 : Singapore + The Philippines + China  
CB/US329 : Korea + The Philippines + China  
CB/US330 : Indonesia + Malaysia + China  
CB/US331 : Singapore + Malaysia + China  
CB/US332 : Korea + Malaysia + China  
CB/US333 : Singapore + Indonesia + China  
CB/US334 : Korea + Indonesia + China  
CB/US335 : Korea + Singapore + China  
CB/US401 : Korea + Singapore + Indonesia + Malaysia  
CB/US402 : Korea + Singapore + Indonesia + The Philippines  
CB/US403 : Korea + Singapore + Malaysia + The Philippines  
CB/US404 : Korea + Indonesia + Malaysia + The Philippines  
CB/US405 : Singapore + Indonesia + Malaysia + The Philippines  
CB/US406 : Korea + Singapore + Indonesia + The Philippines  
CB/US407 : Korea + Singapore + Malaysia + Thailand  
CB/US408 : Korea + Indonesia + Malaysia + Thailand  
CB/US409 : Singapore + Indonesia + Malaysia + Thailand  
CB/US410 : Korea + Singapore + The Philippines + Thailand  
CB/US411 : Korea + Indonesia + The Philippines + Thailand  
CB/US412 : Singapore + Indonesia + The Philippines + Thailand  
CB/US413 : Korea + Malaysia + The Philippines + Thailand  
CB/US414 : Singapore + Malaysia + The Philippines + Thailand  
CB/US415 : Indonesia + Malaysia + The Philippines + Thailand  
CB/US416 : Korea + Singapore + Indonesia + China  
CB/US417 : Korea + Singapore + Malaysia + China  
CB/US418 : Korea + Indonesia + Malaysia + China  
CB/US419 : Singapore + Indonesia + Malaysia + China  
CB/US420 : Korea + Singapore + The Philippines + China  
CB/US421 : Korea + Indonesia + The Philippines + China  
CB/US422 : Singapore + Indonesia + The Philippines + China  
CB/US423 : Korea + Malaysia + The Philippines + China  
CB/US424 : Singapore + Malaysia + The Philippines + China  
CB/US425 : Indonesia + Malaysia + The Philippines + China  
CB/US426 : Korea + Singapore + Thailand + China  
CB/US427 : Korea + Indonesia + Thailand + China  
CB/US428 : Singapore + Indonesia + Thailand + China  
CB/US429 : Korea + Malaysia + Thailand + China  
CB/US430 : Singapore + Malaysia + Thailand + China  
CB/US431 : Indonesia + Malaysia + Thailand + China  
CB/US432 : Korea + The Philippines + Thailand + China  
CB/US433 : Singapore + The Philippines + Thailand + China  
CB/US434 : Indonesia + The Philippines + Thailand + China  
CB/US435 : Malaysia + The Philippines + Thailand + China  
CB/US501 : Korea + Singapore + Indonesia + Malaysia + The Philippines  
CB/US502 : Korea + Singapore + Indonesia + Malaysia + Thailand  
CB/US503 : Korea + Singapore + Indonesia + The Philippines + Thailand  
CB/US504 : Korea + Singapore + Malaysia + The Philippines + Thailand  
CB/US505 : Korea + Indonesia + Malaysia + The Philippines + Thailand  
CB/US506 : Singapore + Indonesia + Malaysia + The Philippines + Thailand  
CB/US507 : Korea + Singapore + Indonesia + Malaysia + China  
CB/US508 : Korea + Singapore + Indonesia + The Philippines + China  
CB/US509 : Korea + Singapore + Malaysia + The Philippines + China  
CB/US510 : Korea + Indonesia + Malaysia + The Philippines + China  
CB/US511 : Singapore + Indonesia + Malaysia + The Philippines + China  
CB/US512 : Korea + Singapore + Indonesia + Thailand + China  
CB/US513 : Korea + Singapore + Malaysia + Thailand + China  
CB/US514 : Korea + Indonesia + Malaysia + Thailand + China  
CB/US515 : Singapore + Indonesia + Malaysia + Thailand + China  
CB/US516 : Korea + Singapore + The Philippines + Thailand + China  
CB/US517 : Korea + Indonesia + The Philippines + Thailand + China  
CB/US518 : Singapore + Indonesia + The Philippines + Thailand + China  
CB/US519 : Korea + Malaysia + The Philippines + Thailand + China  
CB/US520 : Singapore + Malaysia + The Philippines + Thailand + China  
CB/US521 : Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US522 : Korea + Singapore + Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US523 : Korea + Singapore + Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US524 : Korea + Singapore + Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US525 : Korea + Singapore + Malaysia + The Philippines + Thailand + China  
CB/US526 : Korea + Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US527 : Singapore + Malaysia + The Philippines + Thailand + China  
CB/US528 : Korea + Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US529 : Singapore + Malaysia + The Philippines + Thailand + China  
CB/US530 : Indonesia + Malaysia + The Philippines + Thailand + China  
CB/US531 : Singapore + Malaysia + The Philippines + Thailand + China  
CB/US532 : Korea + Malaysia + The Philippines + Thailand + China  
CB/US533 : Singapore + Indonesia + The Philippines + Thailand + China  
CB/US534 : Korea + Indonesia + The Philippines + Thailand + China  
CB/US535 : Korea + Singapore + The Philippines + Thailand + China

2. Since we set that DGF are equalized from lags 2 to lags12, the starting point of the sample period for all estimations are valid

CB/US301 : 335, DGF=105, Lags2=1988:04, Lags3=1988:01, Lags4=1987:10, Lags5=1987:07, Lags6=1987:04, Lags7=1987:01, Lags8=1986:10, Lags9=1986:07, Lags10=1986:04, Lags11=1986:01, Lags12=1985:10,  
CB/US401 : 435, DGF=93, Lags2=1989:02, Lags3=1988:10, Lags4=1988:06, Lags5=1988:02, Lags6=1987:10, Lags7=1987:06, Lags8=1987:02, Lags9=1986:10, Lags10=1986:06, Lags11=1986:02, Lags12=1985:10,  
CB/US501 : 521, DGF=61, Lags2=1989:12, Lags3=1989:07, Lags4=1989:02, Lags5=1988:09, Lags6=1988:04, Lags7=1987:11, Lags8=1987:06, Lags9=1987:01, Lags10=1986:08, Lags11=1986:03, Lags12=1985:10,  
CB/US601 : 607, DGF=69, Lags2=1991:10, Lags3=1990:04, Lags4=1989:10, Lags5=1988:10, Lags6=1988:04, Lags7=1987:10, Lags8=1987:04, Lags9=1987:04, Lags10=1986:10, Lags11=1986:04, Lags12=1985:10,  
CB/US701 : DGF=57, Lags2=1991:08, Lags3=1991:01, Lags4=1990:06, Lags5=1989:11, Lags6=1989:04, Lags7=1988:09, Lags8=1988:02, Lags9=1987:07, Lags10=1986:12, Lags11=1986:05, Lags12=1985:10.

Table 3: Chi-square based Tests

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	2.5%	1%							
CB301	2	1	1	2.71	3.84	5.02	6.63	8.04 ***	11.78 ****	1.58				
	1	2	4.61	5.99	7.38	9.21	11.78 ****	8.25 **	14.3 ****					
	1	1	2.71	3.84	5.02	6.63	5.68 **	0.43	0.27					
CB302	2	1	1	2.71	3.84	5.02	6.63	7.41 ****	10.23 ****	2.25				
	1	2	4.61	5.99	7.38	9.21	10.68 ****	8.91 **	15.71 ****					
	1	1	2.71	3.84	5.02	6.63	7.53 ****	0.92	0.07					
CB303	6	1	1	2.71	3.84	5.02	6.63	15.55 ****	17.3 ****	15.08 ****				
	1	2	4.61	5.99	7.38	9.21	18.47 ****	20.83 ****	20.94 ****					
	1	1	2.71	3.84	5.02	6.63	0.29	7.83 ****	2.04					
CB304	2	1	1	2.71	3.84	5.02	6.63	3.32 *	11.21 ****	11.63 ****				
	1	2	4.61	5.99	7.38	9.21	13.44 ****	11.89 ****	15.08 ****					
	1	1	2.71	3.84	5.02	6.63	0.33	4.86 **	0					
CB305	2	1	1	2.71	3.84	5.02	6.63	6 ***	9.85 ****	2.5				
	1	2	4.61	5.99	7.38	9.21	11.61 ****	8.94 **	17.98 ****					
	1	1	2.71	3.84	5.02	6.63	7.87 ****	1.5	0.04					
CB307	11	1	1	2.71	3.84	5.02	6.63	4.63 **	17.36 ****	5.19 ***				
	1	2	4.61	5.99	7.38	9.21	18.86 ****	5.59 *	17.77 ****					
	1	1	2.71	3.84	5.02	6.63	14.58 ****	8.63 ****	2.25					
CB308	3	1	1	2.71	3.84	5.02	6.63	16.01 ****	15.02 ****	18.32 ****				
	1	2	4.61	5.99	7.38	9.21	18.94 ****	30.01 ****	28.31 ****					
	1	1	2.71	3.84	5.02	6.63	10.12 ****	0.19	4.29 **					
CB310	4	1	1	2.71	3.84	5.02	6.63	8.7 ****	16.47 ****	11.67 ****				
	1	2	4.61	5.99	7.38	9.21	16.53 ****	15.11 ****	20.66 ****					
	1	1	2.71	3.84	5.02	6.63	0.17	4.14 **	0.34					
CB311	9	2	2	4.61	5.99	7.38	9.21	15.4 ****	15.01 ****	5.76 *				
	2	1	2.71	3.84	5.02	6.63	4.92 **	4.36 **	6.53 ***					
	2	2	4.61	5.99	7.38	9.21	6.69 **	9.03 **	3.66					
CB312	3	1	1	2.71	3.84	5.02	6.63	10.81 ****	16.96 ****	13.47 ****				
	1	2	4.61	5.99	7.38	9.21	17.45 ****	27.52 ****	24.55 ****					
	1	1	2.71	3.84	5.02	6.63	5.51 **	0.08	0.07					
CB313	4	1	1	2.71	3.84	5.02	6.63	8.7 ****	12.21 ****	8.82 ****				
	1	2	4.61	5.99	7.38	9.21	18.43 ****	8.91 ***	15.25 ****					
	1	1	2.71	3.84	5.02	6.63	6.17 **	9.46 ****	3.44 *					

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 1)

Combination	k	r	DGF	10%	5%	CHISQ	2.5%	1%	Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
CB314	3	1	1	2.71	3.84	5.02	6.63	6.63	0.58			6.91 ****		7.48 ****	
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	7.85 ***			18.56 ****		14.12 ****	
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	6.89 ****			0.11		2.05	
CB315	11	1	1	2.71	3.84	5.02	6.63	6.63	12.48 ****			31.48 ****		7.9 ****	
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	39.22 ****			12.54 ****		31.67 ****	
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	28.05 ****			15.12 ****		5.87 ***	
CB316	7	1	1	2.71	3.84	5.02	6.63	6.63			7.22 ****	6.76 ****		0.55	
	1	2	4.61	5.99	7.38	9.21	9.21	9.21			11.63 ****	13.61 ****		15.17 ****	
	1	1	2.71	3.84	5.02	6.63	6.63	6.63			6.84 ****	0.97		4.77 **	
CB320	12	1	1	2.71	3.84	5.02	6.63	6.63			1.44	1.44	2.87 *	1	
	1	2	4.61	5.99	7.38	9.21	9.21	9.21			2.92	2.92	8.57 ***	3.51	
	1	1	2.71	3.84	5.02	6.63	6.63	6.63			5.39 ***	2.71	6.16 ***		
CB322	4	1	1	2.71	3.84	5.02	6.63	6.63			3.31 *	3.31 *	5.04 ***	1.9	
	1	2	4.61	5.99	7.38	9.21	9.21	9.21			8.88 ***	8.88 ***	10.39 ****	5.36 *	
	1	1	2.71	3.84	5.02	6.63	6.63	6.63			7.28 ****	7.28 ****	1.61	0.11	
CB324	11	1	1	2.71	3.84	5.02	6.63	6.63	10.79 ****					3.2 *	9.41 ****
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	19.13 ****					10.91 ****	29.23 ****
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	22.01 ****					6.87 ****	4.04 **
CB325	10	1	1	2.71	3.84	5.02	6.63	6.63	13.41 ****					8.76 ****	9.75 ****
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	13.33 ****					14.06 ****	15.02 ****
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	3.08 *					0.02	0.01
CB326	12	2	2	4.61	5.99	7.38	9.21	9.21			1.93	15.49 ****	17.58 ****		11.38 ****
	2	1	2.71	3.84	5.02	6.63	6.63	6.63			4.9 *	2.78 *	10.03 ****		8.88 ****
	2	2	4.61	5.99	7.38	9.21	9.21	9.21			0.72	21.05 ****	20.78 ****		4.08
CB327	12	1	1	2.71	3.84	5.02	6.63	6.63					4.05 **		4.82 **
	1	2	4.61	5.99	7.38	9.21	9.21	9.21					11.84 ****		13.07 ****
	1	1	2.71	3.84	5.02	6.63	6.63	6.63					8.19 ****		1.22
CB328	12	1	1	2.71	3.84	5.02	6.63	6.63	4.08 **				0.05		11.45 ****
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	17.21 ****				12 ****		19.08 ****
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	17.27 ****			8.09 ****		5.17 ***	
CB329	3	1	1	2.71	3.84	5.02	6.63	6.63	19.75 ****				0.01		8.64 ****
	1	2	4.61	5.99	7.38	9.21	9.21	9.21	13.04 ****				19.8 ****		22.23 ****
	1	1	2.71	3.84	5.02	6.63	6.63	6.63	16.26 ****				1.02		0.12

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.



Table 3: Chi-square based Tests (continued: 2)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (SG\$)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				5%	3%	1.0%	1%							
CB330	4	1	1	2.71	3.84	5.02	6.63		11.11 ****	14.38 ****			8.82 ****	
	1	2	1	4.61	5.99	7.38	9.21		14.82 ****	12.13 ****			18.06 ****	
	1	1	1	2.71	3.84	5.02	6.63		0.41	2.83 *			1.42	
CB331	3	1	1	2.71	3.84	5.02	6.63		5.57 ***	5.38 ***			3.2 *	
	1	2	1	4.61	5.99	7.38	9.21		6.51 **	6.17 **			8.47 ***	
	1	1	1	2.71	3.84	5.02	6.63		0.66	0.31			2.82 *	
CB332	3	1	1	2.71	3.84	5.02	6.63	21.7 ****		0.51			11.93 ****	
	1	2	1	4.61	5.99	7.38	9.21	12.56 ****		22.24 ****			24.14 ****	
	1	1	1	2.71	3.84	5.02	6.63	12.26 ****		0.17			3.16 *	
CB335	9	2	2	4.61	5.99	7.38	9.21	18.5 ****	12.21 ****				13.71 ****	
	2	1	2	2.71	3.84	5.02	6.63	7.9 ****	11.31 ****				11.58 ****	
	2	2	2	4.61	5.99	7.38	9.21	13.53 ****	14.11 ****				6.78 **	
CB401	6	2	2	4.61	5.99	7.38	9.21	14.19 ****	9.37 ****	24.92 ****	21.81 ****			
	2	2	2	4.61	5.99	7.38	9.21	11.34 ****	12.65 ****	23.06 ****	20.75 ****			
	2	2	2	4.61	5.99	7.38	9.21	1.83	5.72 *	11.68 ****	6.75 **			
CB402	3	1	1	2.71	3.84	5.02	6.63	10.44 ****	5.04 ***	8.01 ****		0.94		
	1	3	1	6.25	7.81	9.35	11.34	14.94 ****	12.52 ****	14.92 ****		18.68 ****		
	1	1	1	2.71	3.84	5.02	6.63	0.17	0.74	2.64		1.19		
CB404	12	2	2	4.61	5.99	7.38	9.21	18.15 ****		22.46 ****	15.58 ****	14.94 ****		
	2	2	2	4.61	5.99	7.38	9.21	11.33 ****		8.02 ***	7.57 ***	17.46 ****		
	2	2	2	4.61	5.99	7.38	9.21	6.76 **		12.7 ****	14.87 ****	5.26 *		
CB405	3	1	1	2.71	3.84	5.02	6.63		0.01	8.4 ****	10.6 ****	6.16 ***		
	1	3	1	6.25	7.81	9.35	11.34		15.53 ****	13.83 ****	17.8 ****	18.32 ****		
	1	1	1	2.71	3.84	5.02	6.63		0.25	0.49	1.72	1.35		
CB406	4	2	2	4.61	5.99	7.38	9.21	12.15 ****	12.74 ****	15.92 ****		13.73 ****		
	2	2	2	4.61	5.99	7.38	9.21	11.45 ****	8.4 ***	13.89 ****		15.45 ****		
	2	2	2	4.61	5.99	7.38	9.21	11.99 ****	6.34 **	15.03 ****		5.32 *		
CB407	5	2	2	4.61	5.99	7.38	9.21	12.56 ****	14.32 ****		8.75 ***	10.66 ****		
	2	2	2	4.61	5.99	7.38	9.21	6.55 **	10.18 ****		9.65 ****	10.22 ****		
	2	2	2	4.61	5.99	7.38	9.21	10.56 ****	6.55 **		2.84	2.29		
CB408	6	1	1	2.71	3.84	5.02	6.63	5.51 ***		15.63 ****	4.64 **	4.81 **		
	1	3	1	6.25	7.81	9.35	11.34	19.5 ****		19.27 ****	23.33 ****	26.54 ****		
	1	1	1	2.71	3.84	5.02	6.63	0.11		6.94 ****	4.29 **	3.83 *		

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 3)

Combination	k	r	DGF	CHISQ			Korea (Won)	Singapore (SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	1%							
CB409	4	1	1	2.71	3.84	5.02	6.63	10.69	20.43	13.21	7.8	7.8	7.8
	1	3	3	6.25	7.81	9.35	11.34	28.09	23.1	29.53	29.31	29.31	29.31
	1	1	1	2.71	3.84	5.02	6.63	1.6	11.4	0.26	4.16	4.16	4.16
CB410	4	1	1	2.71	3.84	5.02	6.63	8.79	11.92	0	1.56	1.56	1.56
	1	3	3	6.25	7.81	9.35	11.34	14.91	10.47	19.23	16.53	16.53	16.53
	1	1	1	2.71	3.84	5.02	6.63	8.96	2.26	0.54	1.16	1.16	1.16
CB411	5	1	1	2.71	3.84	5.02	6.63	8.13	19.49	2.01	9.91	9.91	9.91
	1	3	3	6.25	7.81	9.35	11.34	24.04	27.92	29.67	29.36	29.36	29.36
	1	1	1	2.71	3.84	5.02	6.63	0.81	3.62	1.57	1.73	1.73	1.73
CB415	11	1	1	2.71	3.84	5.02	6.63	5.82	0.86	2.19	3.47	3.47	3.47
	1	3	3	6.25	7.81	9.35	11.34	11.13	11.53	18.55	18.98	18.98	18.98
	1	1	1	2.71	3.84	5.02	6.63	5.26	10.99	3.77	5.27	5.27	5.27
CB416	10	3	3	6.25	7.81	9.35	11.34	15.61	17.19	16.04	15.3	15.3	15.3
	3	1	1	2.71	3.84	5.02	6.63	7.15	15.18	0	12.11	12.11	12.11
	3	3	3	6.25	7.81	9.35	11.34	19.29	15.4	16.69	8.47	8.47	8.47
CB417	5	1	1	2.71	3.84	5.02	6.63	5.59	0.21	0.11	0.3	0.3	0.3
	1	3	3	6.25	7.81	9.35	11.34	12.05	17.21	21.71	22.31	22.31	22.31
	1	1	1	2.71	3.84	5.02	6.63	6.58	0.13	0	0.52	0.52	0.52
CB418	11	1	1	2.71	3.84	5.02	6.63	11.28	10.36	8.41	7.22	7.22	7.22
	1	3	3	6.25	7.81	9.35	11.34	26.23	13.84	14.49	19.81	19.81	19.81
	1	1	1	2.71	3.84	5.02	6.63	4.36	12.42	3.66	11.86	11.86	11.86
CB419	4	1	1	2.71	3.84	5.02	6.63	1.83	19.08	12.14	5.62	5.62	5.62
	1	3	3	6.25	7.81	9.35	11.34	24.7	19.8	25.87	26.12	26.12	26.12
	1	1	1	2.71	3.84	5.02	6.63	0.09	4.54	0.05	1.28	1.28	1.28
CB420	4	1	1	2.71	3.84	5.02	6.63	6.76	0.96	0	0.46	0.46	0.46
	1	3	3	6.25	7.81	9.35	11.34	13.63	11.84	16.35	19.61	19.61	19.61
	1	1	1	2.71	3.84	5.02	6.63	10.38	1.06	0.57	0	0	0
CB422	12	2	2	4.61	5.99	7.38	9.21	7.06	15.54	18.7	16.24	16.24	16.24
	2	2	2	4.61	5.99	7.38	9.21	14.8	5.19	15.19	18.41	18.41	18.41
	2	2	2	4.61	5.99	7.38	9.21	19.5	4.08	14.14	4.58	4.58	4.58
CB425	11	1	1	2.71	3.84	5.02	6.63	0.99	7.49	6.61	2.33	2.33	2.33
	1	3	3	6.25	7.81	9.35	11.34	11.67	10.04	22.1	18.6	18.6	18.6
	1	1	1	2.71	3.84	5.02	6.63	4.46	11.58	0.71	0.72	0.72	0.72

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 4)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	2.5%	1%							
CB426	8	1	1	2.71	3.84	5.02	6.63	5.12 ***	14.04 ****	12.13 ****	13.31 ****	12.13 ****	13.31 ****	
	1	3	3	6.25	7.81	9.35	11.34	26.51 ****	22.88 ****	36.46 ****	33.7 ****	36.46 ****	33.7 ****	
	1	1	1	2.71	3.84	5.02	6.63	9.01 ****	11.9 ****	4.25 **	2.85 *	4.25 **	2.85 *	
CB428	10	1	1	2.71	3.84	5.02	6.63	4.82 **	13.57 ****	5.41 ***	3.08 *	5.41 ***	3.08 *	
	1	3	3	6.25	7.81	9.35	11.34	28.57 ****	6.52 *	19.2 ****	24.46 ****	19.2 ****	24.46 ****	
	1	1	1	2.71	3.84	5.02	6.63	16.51 ****	17.02 ****	13.07 ****	12.49 ****	13.07 ****	12.49 ****	
CB431	11	2	2	4.61	5.99	7.38	9.21	13.52 ****	12.31 ****	5.82 *	3.5	5.82 *	3.5	
	2	2	2	4.61	5.99	7.38	9.21	8.16 ***	8.58 ***	15.39 ****	12.33 ****	15.39 ****	12.33 ****	
	2	2	2	4.61	5.99	7.38	9.21	16.62 ****	21.71 ****	11.54 ****	8.17 ***	11.54 ****	8.17 ***	
CB434	12	1	1	2.71	3.84	5.02	6.63	14.33 ****	14.22 ****	0.06	11.49 ****	0.06	11.49 ****	
	1	3	3	6.25	7.81	9.35	11.34	16.19 ****	25.46 ****	19.07 ****	25.4 ****	19.07 ****	25.4 ****	
	1	1	1	2.71	3.84	5.02	6.63	4.23 **	3.05 *	0.7	0.84	0.7	0.84	
CB502	3	1	1	2.71	3.84	5.02	6.63	4.71 **	0.18	4.44 **		4.44 **		
	1	4	4	7.78	9.49	11.14	13.28	15.46 ****	11.95 **	12.7 ***		12.7 ***		
	1	1	1	2.71	3.84	5.02	6.63	4.69 **	2.85 *	3.3 *		3.3 *		
CB503	5	1	1	2.71	3.84	5.02	6.63	7.78 ****	16.75 ****	9.69 ****	14 ****	9.69 ****	14 ****	
	1	4	4	7.78	9.49	11.14	13.28	28.54 ****	27.72 ****	34 ****	32.8 ****	34 ****	32.8 ****	
	1	1	1	2.71	3.84	5.02	6.63	3.83 *	15.86 ****	3.95 **	5.58 ***	3.95 **	5.58 ***	
CB507	7	1	1	2.71	3.84	5.02	6.63	9.05 ****	29.26 ****	20.25 ****	12.86 ****	20.25 ****	12.86 ****	
	1	4	4	7.78	9.49	11.14	13.28	35.27 ****	40.38 ****	43.39 ****	42.05 ****	43.39 ****	42.05 ****	
	1	1	1	2.71	3.84	5.02	6.63	1.76	10.26 ****	0.73	5.45 ***	10.26 ****	5.45 ***	
CB512	6	1	1	2.71	3.84	5.02	6.63	3.44 *	6.64 ****	12.5 ****	10.53 ****	6.64 ****	10.53 ****	
	1	4	4	7.78	9.49	11.14	13.28	22.82 ****	27.62 ****	25.11 ****	30.17 ****	27.62 ****	30.17 ****	
	1	1	1	2.71	3.84	5.02	6.63	8.07 ****	2.74 *	6.99 ****	0.74	8.07 ****	6.99 ****	
CB517	2	1	1	2.71	3.84	5.02	6.63	0.01	11.35 ****	5.08 ***	16.26 ****	11.35 ****	16.26 ****	
	1	4	4	6.25	7.81	9.35	11.34	22.43 ****	19.89 ****	25.28 ****	23.07 ****	19.89 ****	25.28 ****	
	1	1	1	2.71	3.84	5.02	6.63	7.91 **	8.78 **	18.45 ****	6.84 *	7.91 **	18.45 ****	
CB602	3	1	1	2.71	3.84	5.02	6.63	1.36	2.19	10.85 ****	9.31 ****	1.36	10.85 ****	
	1	5	5	9.24	11.1	12.83	16.81	26.53 ****	32.09 ****	31.94 ****	32.88 ****	26.53 ****	32.88 ****	
	1	1	1	2.71	3.84	5.02	6.63	0.85	0.58	2.61	0.46	0.85	2.61	
CB603	2	1	1	2.71	3.84	5.02	6.63	1.89	1.13	10.33 ****	10.23 ****	1.89	10.33 ****	
	1	5	5	9.24	11.1	12.83	16.81	29.03 ****	32.29 ****	27.36 ****	30.95 ****	29.03 ****	30.95 ****	
	1	1	1	2.71	3.84	5.02	6.63	9 ****	10.2 ****	5.42 ***	7.75 ****	9 ****	10.2 ****	

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 5)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				5%	3%	1.0%	1%							
CB604	2	1	1	2.71	3.84	5.02	6.63	3.49 *	0.23	20.44 ****	9.61 ****	14.02 ****	1.67	
	1	5	1	9.24	11.1	12.83	16.81	30.87 ****	34.74 ****	30.08 ****	34.77 ****	33 ****	37.87 ****	
	1	1	1	2.71	3.84	5.02	6.63	16.64 ****	12.41 ****	15.39 ****	20 ****	10.95 ****	9.19 ****	
US301	3	1	1	2.71	3.84	5.02	6.63	5.14 **	2.24	4.76 **				
	1	2	1	4.61	5.99	7.38	9.21	4.86 *	15.48 ****	18.69 ****				
	1	1	1	2.71	3.84	5.02	6.63	9.1 ****	0.43	3.53 *				
US303	5	1	1	2.71	3.84	5.02	6.63	3.3 *		13.2 ****	13.39 ****			
	1	2	1	4.61	5.99	7.38	9.21	13.65 ****		21.27 ****	18.38 ****			
	1	1	1	2.71	3.84	5.02	6.63	2.36		7.09 ****	4.82 **			
US306	3	1	1	2.71	3.84	5.02	6.63	6.32 **		12.42 ****	10.75 ****			
	1	2	1	4.61	5.99	7.38	9.21	12.49 ****		26.62 ****	25.9 ****			
	1	1	1	2.71	3.84	5.02	6.63	13.47 ****		5.79 **	0.39			
US308	4	1	1	2.71	3.84	5.02	6.63	2.54		13.18 ****	13.04 ****			
	1	2	1	4.61	5.99	7.38	9.21	13.2 ****		24.01 ****	25.31 ****			
	1	1	1	2.71	3.84	5.02	6.63	1.57		14.48 ****	2.79 *			
US310	11	1	1	2.71	3.84	5.02	6.63			13.27 ****	1.48	0.16		
	1	2	1	4.61	5.99	7.38	9.21			4.89 *	17.58 ****	22.12 ****		
	1	1	1	2.71	3.84	5.02	6.63			14.19 ****	1.03	0.29		
US311	11	1	1	2.71	3.84	5.02	6.63	20.48 ****	2.83 *			1.17		
	1	2	1	4.61	5.99	7.38	9.21	7.22 **	25.69 ****			27.66 ****		
	1	1	1	2.71	3.84	5.02	6.63	14.19 ****	0.05			5.3 **		
US312	3	1	1	2.71	3.84	5.02	6.63	5.6 **		7 ****		5.23 **		
	1	2	1	4.61	5.99	7.38	9.21	7.01 **		23.31 ****		21.98 ****		
	1	1	1	2.71	3.84	5.02	6.63	13.07 ****		4.46 **		0.04		
US313	5	1	1	2.71	3.84	5.02	6.63		18.11 ****	14.22 ****		17.53 ****		
	1	2	1	4.61	5.99	7.38	9.21		17.56 ****	18.55 ****		18.11 ****		
	1	1	1	2.71	3.84	5.02	6.63		1.23	1.15		15.1 ****		
US314	7	2	2	4.61	5.99	7.38	9.21	9.95 ****			10.83 ****	9.6 ****		
	2	1	1	2.71	3.84	5.02	6.63	0			9.55 ****	9.09 ****		
	2	2	2	4.61	5.99	7.38	9.21	11.03 ****			11.34 ****	1.72		
US316	5	2	2	4.61	5.99	7.38	9.21	17.95 ****		19.47 ****		8.37 **		
	2	1	1	2.71	3.84	5.02	6.63	7.67 ****		6.87 ****		6.58 **		
	2	2	2	4.61	5.99	7.38	9.21	9.4 ****		11.03 ****		4.08		

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 6)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				5%	3%	1.0%	1%							
US317	9	1	1	2.71	3.84	5.02	6.63	4.42 **			8.44 ****	8.24 ****		
	1	2	1	4.61	5.99	7.38	9.21	8.49 ***			15.91 ****	15 ****		
	1	1	1	2.71	3.84	5.02	6.63	1.08			7.95 ****	1.06		
US321	7	2	2	4.61	5.99	7.38	9.21				14.9 ****	18.4 ****	16.52 ****	
	2	1	2	2.71	3.84	5.02	6.63				9.82 ****	9.44 ****	7.82 ****	
	2	2	2	4.61	5.99	7.38	9.21				14.23 ****	14.5 ****	0.02	
US322	6	2	2	4.61	5.99	7.38	9.21			10.74 ****	15.75 ****	18.65 ****		
	2	1	2	2.71	3.84	5.02	6.63			10.19 ****	10.35 ****	9.53 ****		
	2	2	2	4.61	5.99	7.38	9.21			12.59 ****	18.79 ****	0.79		
US323	3	1	1	2.71	3.84	5.02	6.63	3.14 *			12.71 ****	15.9 ****		
	1	2	1	4.61	5.99	7.38	9.21	21.1 ****			21.86 ****	18.17 ****		
	1	1	1	2.71	3.84	5.02	6.63	4.4 **			14.02 ****	1.02		
US324	5	1	1	2.71	3.84	5.02	6.63	8.32 ****			4.27 **	22.55 ****		
	1	2	1	4.61	5.99	7.38	9.21	25.97 ****			25.81 ****	27.25 ****		
	1	1	1	2.71	3.84	5.02	6.63	24.09 ****			11.42 ****	0.61		
US325	4	1	1	2.71	3.84	5.02	6.63	4.96 **			6.11 ***	6.08 ***		
	1	2	1	4.61	5.99	7.38	9.21	6.17 **			15.89 ****	15.43 ****		
	1	1	1	2.71	3.84	5.02	6.63	4.03 **			6.38 ***	0.09		
US326	12	1	1	2.71	3.84	5.02	6.63			7.45 ****	18.43 ****	25.53 ****		
	1	2	1	4.61	5.99	7.38	9.21			27.4 ****	30.48 ****	22.08 ****		
	1	1	1	2.71	3.84	5.02	6.63			5.32 ***	20.01 ****	0.62		
US328	2	1	1	2.71	3.84	5.02	6.63	6.55 ***			0.12	8.53 ****		
	1	2	1	4.61	5.99	7.38	9.21	13.18 ****			13.98 ****	12.97 ****		
	1	1	1	2.71	3.84	5.02	6.63	8.23 ****			0.31	1.23		
US330	4	2	2	4.61	5.99	7.38	9.21			16.17 ****	18.7 ****	10.2 ****		
	2	1	2	2.71	3.84	5.02	6.63			9.8 ****	10.14 ****	8.83 ****		
	2	2	2	4.61	5.99	7.38	9.21			12.98 ****	14 ****	1.32		
US331	7	1	1	2.71	3.84	5.02	6.63	15.04 ****			2.11	15.85 ****		
	1	2	1	4.61	5.99	7.38	9.21	18.12 ****			17.44 ****	19.3 ****		
	1	1	1	2.71	3.84	5.02	6.63	14.93 ****			1.32	1.02		
US333	6	1	1	2.71	3.84	5.02	6.63	19.56 ****			4.03 **	21.13 ****		
	1	2	1	4.61	5.99	7.38	9.21	24.23 ****			21.74 ****	24.9 ****		
	1	1	1	2.71	3.84	5.02	6.63	17.86 ****			8.68 ****	1		

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 7)

Combination	k	r	DGF	CHISQ			Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				5%	3%	1.0%							
US334	3	1	1	2.71	3.84	5.02	6.63	4.18 **	4.65 **			3.06 *	
	1	2	2	4.61	5.99	7.38	9.21	4.68 *	17.92 ****			13.51 ****	
	1	1	1	2.71	3.84	5.02	6.63	7.28 ****	3.4 *			0.25	
US335	5	1	1	2.71	3.84	5.02	6.63	0	17.02 ****			16.91 ****	
	1	2	2	4.61	5.99	7.38	9.21	17.02 ****	21.39 ****			22.78 ****	
	1	1	1	2.71	3.84	5.02	6.63	1.18	17.39 ****			1.02	
US401	5	2	2	4.61	5.99	7.38	9.21	0.59	6.83 **	11.32 ****	7.5 **		
	2	2	2	4.61	5.99	7.38	9.21	8.02 **	14.9 ****	15.42 ****	11.56 ****		
	2	2	2	4.61	5.99	7.38	9.21	2.83	5.3 *	11.18 ****	8.04 **		
US403	3	1	1	2.71	3.84	5.02	6.63	0.37	3.72 *	24.63 ****	20.31 ****		
	1	3	3	6.25	7.81	9.35	11.34	25.16 ****	27.36 ****	28.69 ****	28.38 ****		
	1	1	1	2.71	3.84	5.02	6.63	2.14	2.66	19.03 ****	2.82 *		
US404	4	1	1	2.71	3.84	5.02	6.63	0.37		0.08	7.33 ****	8.61 ****	
	1	3	3	6.25	7.81	9.35	11.34	21.08 ****		26.43 ****	25.39 ****	26.76 ****	
	1	1	1	2.71	3.84	5.02	6.63	1.01		1.42	7.13 ****	2.63	
US406	6	2	2	4.61	5.99	7.38	9.21	7.18 **	7.64 **	10.28 ****		8.08 ***	
	2	2	2	4.61	5.99	7.38	9.21	9.34 ****	13.38 ****	17.79 ****		16.65 ****	
	2	2	2	4.61	5.99	7.38	9.21	6.06 **	2.46	10.23 ****		5.66 *	
US409	4	2	2	4.61	5.99	7.38	9.21	18.1 ****	15.29 ****	9.83 ****		13.55 ****	
	2	2	2	4.61	5.99	7.38	9.21	10.91 ****	18.37 ****	13.22 ****		14.41 ****	
	2	2	2	4.61	5.99	7.38	9.21	8.21 **	9.42 ****	13.35 ****		14.61 ****	
US411	5	1	1	2.71	3.84	5.02	6.63	1.72	14.83 ****		2.57	4.52 **	
	1	3	3	6.25	7.81	9.35	11.34	14.91 ****	27.41 ****	27.74 ****	24.91 ****		
	1	1	1	2.71	3.84	5.02	6.63	7.9 ****	11.31 ****	0.53	0.31		
US413	4	1	1	2.71	3.84	5.02	6.63	2.62		23.79 ****	18.04 ****	2.93 *	
	1	3	3	6.25	7.81	9.35	11.34	24.41 ****		29.98 ****	31.16 ****	30.13 ****	
	1	1	1	2.71	3.84	5.02	6.63	0.61		23.02 ****	1.03	4.77 **	
US416	5	2	2	4.61	5.99	7.38	9.21	2.12	15.13 ****	7.33 **		14.82 ****	
	2	2	2	4.61	5.99	7.38	9.21	7.18 **	12.65 ****	18.19 ****		14.01 ****	
	2	2	2	4.61	5.99	7.38	9.21	5.51 *	15.24 ****	7.06 **		0.94	
US417	5	1	1	2.71	3.84	5.02	6.63	0	9.77 ****		0.37	9.99 ****	
	1	3	3	6.25	7.81	9.35	11.34	13.31 ****	20.72 ****	20.23 ****		22.25 ****	
	1	1	1	2.71	3.84	5.02	6.63	2.13	7.93 ****	0		1.03	

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 8)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (SGD)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				5%	3%	1.0%	1%							
US418	8	1	1	2.71	3.84	5.02	6.63	0.12	16.43 ***	11.91 ****			4.22 **	
	1	3	3	6.25	7.81	9.35	11.34	17.24 ****	29.57 ****	25.1 ****			26.16 ****	
	1	1	1	2.71	3.84	5.02	6.63	0.14	11.77 ****	3.48 *			3.24 *	
US419	5	3	3	6.25	7.81	9.35	11.34		24.39 ****	19.41 ****	17.13 ****		25.68 ****	
	3	1	1	2.71	3.84	5.02	6.63		9.94 ****	14.22 ****	10.32 ****		11.43 ****	
	3	3	3	6.25	7.81	9.35	11.34		21.77 ****	23.49 ****	10.79 ***		3.87	
US420	4	1	1	2.71	3.84	5.02	6.63	0.05	15.66 ****		0.03		16.26 ****	
	1	3	3	6.25	7.81	9.35	11.34	16.66 ****	19.83 ****		20.44 ****		19.32 ****	
	1	1	1	2.71	3.84	5.02	6.63	1.7	15.97 ****		0.17		2.08	
US421	7	2	2	4.61	5.99	7.38	9.21	7.86 ***	14.01 ****		11.26 ****		9.41 ****	
	2	2	2	4.61	5.99	7.38	9.21	8.66 ***	16.43 ****		16.21 ****		12.58 ****	
	2	2	2	4.61	5.99	7.38	9.21	5.98 *	12.79 ****		6.25 **		2.05	
US423	3	1	1	2.71	3.84	5.02	6.63	0.01		18.43 ****	17.22 ****		0.63	
	1	3	3	6.25	7.81	9.35	11.34	19.87 ****		25.47 ****	24.04 ****		24.23 ****	
	1	1	1	2.71	3.84	5.02	6.63	2.23		13.22 ****	3.5 *		0.04	
US425	3	1	1	2.71	3.84	5.02	6.63		0.46	9.68 ****	8.75 ****		2.41	
	1	3	3	6.25	7.81	9.35	11.34		20.3 ****	19.62 ****	19.65 ****		17.27 ****	
	1	1	1	2.71	3.84	5.02	6.63		2.82 *	9.28 ****	0.89		0.14	
US426	9	2	2	4.61	5.99	7.38	9.21	7.03 **	10.59 ****			6.39 **	17.26 ****	
	2	2	2	4.61	5.99	7.38	9.21	5.26 *	9.52 ****			12.57 ****	10.25 ****	
	2	2	2	4.61	5.99	7.38	9.21	1.14	17.58 ****			7.44 ***	0.57	
US427	6	2	2	4.61	5.99	7.38	9.21	7.71 ***	7.76 ***			8.34 ***	10.8 ****	
	2	2	2	4.61	5.99	7.38	9.21	7.99 ***	16.98 ****			15.02 ****	12.49 ****	
	2	2	2	4.61	5.99	7.38	9.21	6.64 **	12.41 ****			6.4 **	1.18	
US428	5	1	1	2.71	3.84	5.02	6.63		0.05	3.65 *		7.32 ****	9.56 ****	
	1	3	3	6.25	7.81	9.35	11.34		25.4 ****	28.59 ****		27.73 ****	26.69 ****	
	1	1	1	2.71	3.84	5.02	6.63		9.32 ****	6.09 ***		12.98 ****	0.68	
US429	4	1	1	2.71	3.84	5.02	6.63	1.51		3.86 **		11.37 ****	13.81 ****	
	1	3	3	6.25	7.81	9.35	11.34	19.24 ****		23.24 ****		25.44 ****	24.33 ****	
	1	1	1	2.71	3.84	5.02	6.63	3.1 *		1.59		13.5 ****	1.01	
US430	5	1	1	2.71	3.84	5.02	6.63		5.18 ***	1.78		6.59 ***	19.76 ****	
	1	3	3	6.25	7.81	9.35	11.34		26.89 ****	25.49 ****		27.43 ****	28.43 ****	
	1	1	1	2.71	3.84	5.02	6.63		18.16 ****	0.26		13.56 ****	0.28	

Test statistics indicate for "long-run exclusion" (upper), "stationarity" (middle), and "weak exogeneity" (lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: 9)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	2.5%	1%							
US431	7	3	3	6.25	7.81	9.35	11.34		18.93 ***	31.31 ***	20.55 ***	23.9 ***		
	3	1	3	2.71	3.84	5.02	6.63		8.97 ***	8.02 ***	8.35 ***	7.6 ***		
	3	3	3	6.25	7.81	9.35	11.34		29.89 ***	12.92 ***	15.07 ***	5.42		
US432	4	1	1	2.71	3.84	5.02	6.63	0.79			5.66 ***	16.29 ***	16.76 ***	
	1	3	3	6.25	7.81	9.35	11.34	17.4 ***			22.72 ***	22.26 ***	19.91 ***	
	1	1	1	2.71	3.84	5.02	6.63	0.38			0.44	17.62 ***	1.92	
US433	3	1	1	2.71	3.84	5.02	6.63	3.63 *			0.51	0.49	9.22 ***	
	1	3	3	6.25	7.81	9.35	11.34	15.22 ***			16.82 ***	16.23 ***	16.38 ***	
	1	1	1	2.71	3.84	5.02	6.63	9.31 ***			0	4.55 **	1.2	
US434	12	2	2	4.61	5.99	7.38	9.21		7.86 ***		21.47 ***	18.61 ***	10.96 ***	
	2	2	2	4.61	5.99	7.38	9.21		5.95 *		20 ***	19.99 ***	18.12 ***	
	2	2	2	4.61	5.99	7.38	9.21		2.6		23.46 ***	7.48 ***	2.38	
US501	3	1	1	2.71	3.84	5.02	6.63	0.39	0.73	15.11 ***	15.16 ***			
	1	4	4	7.78	9.49	11.14	13.28	26.03 ***	27.91 ***	25.22 ***	25.49 ***			
	1	1	1	2.71	3.84	5.02	6.63	0.7	4.24 **	12.39 ***	1.64			
US503	2	1	1	2.71	3.84	5.02	6.63	0.55	3.42 *	2.39	4.37 **	0		
	1	4	4	7.78	9.49	11.14	13.28	29.03 ***	22.77 ***	27.79 ***	26.82 ***	24.83 ***		
	1	1	1	2.71	3.84	5.02	6.63	0.74	6.6 ***	0.54	6.93 ***	0.8		
US505	3	1	1	2.71	3.84	5.02	6.63	0.52	4.13 **	15.74 ***	15.12 ***	4.83 **		
	1	4	4	7.78	9.49	11.14	13.28	29.11 ***	32.27 ***	31.91 ***	31.6 ***	30.95 ***		
	1	1	1	2.71	3.84	5.02	6.63	2.45	4.25 **	8.32 ***	0.8	1.18		
US507	7	2	2	4.61	5.99	7.38	9.21	4.48	15.24 ***	24.61 ***	20.96 ***	17.22 ***		
	2	3	3	6.25	7.81	9.35	11.34	15.67 ***	24.59 ***	22.72 ***		27.95 ***		
	2	2	2	4.61	5.99	7.38	9.21	1	12.93 ***	22.51 ***	4.09	7.73 **		
US508	2	1	1	2.71	3.84	5.02	6.63	0.02	5.25 ***	14.34 ***	3.88 **	8.14 ***		
	1	4	4	7.78	9.49	11.14	13.28	40.31 ***	34.16 ***	40.18 ***	38.77 ***	34.58 ***		
	1	1	1	2.71	3.84	5.02	6.63	3.29 *	3.28 *	2.88 *	13.34 ***	10.93 ***		
US509	3	2	2	4.61	5.99	7.38	9.21	1.44	11.57 ***	19.87 ***	21.35 ***	13.61 ***		
	2	3	3	6.25	7.81	9.35	11.34	13.61 ***	12.08 ***	12.85 ***	14.29 ***	12.75 ***		
	2	2	2	4.61	5.99	7.38	9.21	3.16	7.87 ***	12.91 ***	5.06 *	2.24		
US510	4	1	1	2.71	3.84	5.02	6.63	0.83	1.83	17.67 ***	20.03 ***	6.95 ***		
	1	4	4	7.78	9.49	11.14	13.28	32.29 ***	37.38 ***	35.14 ***	36.13 ***	34.41 ***		
	1	1	1	2.71	3.84	5.02	6.63	0.05	5.75 ***	15.88 ***	0.66	1.19		

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.



Table 3: Chi-square based Tests (continued: 10)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	2.5%	1%							
US511	3	3	3	6.25	7.81	9.35	11.34	10.17 ***	6.28 *	14.62 ****	11.23 ***	10.37 ***		
	3	2	2	4.61	5.99	7.38	9.21	8.31 ***	13.1 ****	9.65 ****	11.07 ****	9.28 ****		
	3	3	3	6.25	7.81	9.35	11.34	9.04 **	8.63 **	13.04 ****	1.69	6.64 *		
US512	6	3	3	6.25	7.81	9.35	11.34	14.46 ****	15.45 ****		18.16 ****	20.84 ****		
	3	2	2	4.61	5.99	7.38	9.21	15.26 ****	15.86 ****		17.4 ****	17.55 ****		
	3	3	3	6.25	7.81	9.35	11.34	22.98 ****	23.66 ****		18.8 ****	1.91		
US513	5	1	1	2.71	3.84	5.02	6.63	8.62 ****	8.13 ****	8.13 ****	10.19 ****	27.79 ****		
	1	4	4	7.78	9.49	11.14	13.28	32.24 ****	33.89 ****	33.89 ****	32.82 ****	34.84 ****		
	1	1	1	2.71	3.84	5.02	6.63	21.85 ****	0.07	0.07	11.92 ****	0.7		
US514	5	2	2	4.61	5.99	7.38	9.21	16.55 ****	7.01 **	7.01 **	25.72 ****	31.19 ****		
	2	3	3	6.25	7.81	9.35	11.34	25.93 ****	24.56 ****	24.56 ****	24.19 ****	22.96 ****		
	2	2	2	4.61	5.99	7.38	9.21	24.34 ****	0.63	0.63	19.25 ****	0.76		
US515	5	2	2	4.61	5.99	7.38	9.21	4.28	1.2	0.75	11.81 ****	11.34 ****		
	2	3	3	6.25	7.81	9.35	11.34	17.13 ****	26.52 ****	24.34 ****	21.94 ****	21.1 ****		
	2	2	2	4.61	5.99	7.38	9.21	13.03 ****	10.86 ****	1.9	10.96 ****	0.65		
US516	4	1	1	2.71	3.84	5.02	6.63	0.38	2.14	5.18 ***	15.35 ****	26.11 ****		
	1	4	4	7.78	9.49	11.14	13.28	35.51 ****	35.2 ****	36.36 ****	35.34 ****	35.88 ****		
	1	1	1	2.71	3.84	5.02	6.63	23.04 ****	4.9 **	0.08	19.09 ****	3.17 *		
US517	2	1	1	2.71	3.84	5.02	6.63	11.46 ****	11.46 ****	3.02 *	1.25	10.76 ****		
	1	4	4	7.78	9.49	11.14	13.28	37.2 ****	37.2 ****	36.82 ****	34.52 ****	31.26 ****		
	1	1	1	2.71	3.84	5.02	6.63	3.76 *	3.76 *	12.5 ****	0.23	11.6 ****		
US518	2	2	2	4.61	5.99	7.38	9.21	2.49	15.58 ****	3.19	6.83 **	7.82 ***		
	2	3	3	6.25	7.81	9.35	11.34	15.54 ****	16.75 ****	16.34 ****	16.15 ****	16.81 ****		
	2	2	2	4.61	5.99	7.38	9.21	5.89 *	5.74 *	13.27 ****	8.58 **	10.96 ****		
US519	3	2	2	4.61	5.99	7.38	9.21	5.42 *	23.45 ****	17.9 ****	19.97 ****	20.26 ****		
	2	3	3	6.25	7.81	9.35	11.34	14.7 ****	16.69 ****	16.4 ****	15.61 ****	14.42 ****		
	2	2	2	4.61	5.99	7.38	9.21	12.18 ****	10.85 ****	3.02	11.92 ****	3.19		
US521	4	2	2	4.61	5.99	7.38	9.21	0.22	12.1 ****	12.4 ****	9.86 ****	15.63 ****		
	2	3	3	6.25	7.81	9.35	11.34	18.09 ****	16.77 ****	17.59 ****	17.05 ****	16.01 ****		
	2	2	2	4.61	5.99	7.38	9.21	11.46 ****	17.96 ****	1.24	8.23 **	2.31		
US602	3	2	2	4.61	5.99	7.38	9.21	7.53 ***	6.94 **	15.57 ****	17.21 ****	12.19 ****		
	2	4	4	7.78	9.49	11.14	13.28	24.16 ****	27.88 ****	24.67 ****	25.71 ****	26.79 ****		
	2	2	2	4.61	5.99	7.38	9.21	1.84	2.87	8.58 **	10.33 ****	5.74 *		

Test statistics indicate for "long-run exclusion" (upper), "stationarity" (middle), and "weak exogeneity" (lower in the calm) respectively.

Table 3: Chi-square based Tests (continued: II)

Combination	k	r	DGF	CHISQ				Korea (Won)	Singapore (\$SG)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Thailand (Baht)	China (Yuan)
				10%	5%	2.5%	1%							
US603	5	2	2	4.61	5.99	7.38	9.21	6.44 **	12.89 ****	13.88 ****	5.34 *	38.21 ****	25.46 ****	
	2	4	4	7.78	9.49	11.14	13.28	19.68 ****	16.22 ****	23.08 ****	20.27 ****	19.74 ****	19.83 ****	
	2	2	2	4.61	5.99	7.38	9.21	19.45 ****	15.9 ****	8.61 **	4.2	28.17 ****	4.37	
US604	4	2	2	4.61	5.99	7.38	9.21	7.49 **	1.66	5.4 *		13.7 ****	24.92 ****	
	2	4	4	7.78	9.49	11.14	13.28	22.22 ****	14.41 ****	22.43 ****	21 ****	17.21 ****	17.93 ****	
	2	2	2	4.61	5.99	7.38	9.21	9.08 **	9.03 **	8.4 **	2.28	16.18 ****	13.45 ****	
US605	3	3	3	6.25	7.81	9.35	11.34	11.15 **	10.67 **		23.86 ****	27.34 ****	14.09 ****	
	3	3	3	6.25	7.81	9.35	11.34	16.65 **	18.07 ****		19.01 ****	17.99 ****	18.42 ****	
	3	3	3	6.25	7.81	9.35	11.34	17.49 **	16.9 **		10.47 **	19.18 ****	17.3 **	
US606	4	3	3	6.25	7.81	9.35	11.34	5.79		14.49 ****	18.18 ****	22.76 ****	25.73 ****	
	3	3	3	6.25	7.81	9.35	11.34	16.74 **		20.45 ****	19.28 ****	19.84 ****	20.31 ****	
	3	3	3	6.25	7.81	9.35	11.34	12.99 **		13.76 ****	8 *	11.99 **	11.24 **	
US607	4	1	1	2.71	3.84	5.02	6.63		3.86 **	0.05	17.47 ****	20.58 ****	7.07 ****	
	1	5	5	9.24	11.1	12.83	15.09		42.42 ****	49.58 ****	43.88 ****	49.59 ****	45.19 ****	
	1	1	1	2.71	3.84	5.02	6.63		14.23 ****	5.97 **	22.59 ****	0.25	8.78 ****	
US701	3	3	3	6.25	7.81	9.35	11.34	8.41 *	7.08	7.19	15.97 ****	20.57 ****	15.13 ****	
	3	4	4	7.78	9.49	11.14	13.28	23.03 **	25.03 ****	25.31 ****	20.88 ****	23.11 ****	25.1 ****	
	3	3	3	6.25	7.81	9.35	11.34	11.4 **	9.01 *	2.65	11.22 **	11.26 **	14.71 ****	

Test statistics indicate for "long-run exclusion"(upper), "stationarity"(middle), and "weak exogeneity"(lower in the calm) respectively.

† Significance level: \*90%, \*\*95%, \*\*\*97.5%, \*\*\*\*99%, k is lag-order of ECM, r is row of matrix beta

Table 2: Johansen tests

Combination	k	H <sub>0</sub>	Currency Basket			US Dollar			
			Eigen			Eigen			
			Vector	L- Max	L- Trace	Vector	L- Max	L- Trace	
301 Korea + Singapore + Indonesia	2	0	0.167	20.310 ***	31.860 ***	0.141	17.320 ***	29.800 ***	
		3	1	0.098	11.390 ***	11.550	0.066	7.790	12.490 *
		2	0	0.001	0.150	0.150	0.040	4.690 *	4.690 *
302 Korea + Singapore + Malaysia	2	0	0.162	19.650 ***	30.760 ***	0.1233	14.61 ***	21.22	
		2	1	0.092	10.690 ***	11.110	0.0511	5.82	6.61
		2	0	0.004	0.420	0.420	0.0071	0.79	0.79
303 Korea + Indonesia + Malaysia	6	0	0.155	20.770 ***	30.300 ***	0.157	20.520 ***	29.090 **	
		5	1	0.070	8.910 **	9.530	0.062	7.680	8.560
		2	0	0.005	0.620	0.620	0.007	0.880	0.880
304 Singapore + Indonesia + Malaysia	2	0	0.126	14.890 ***	26.340 *	0.154	20.130 ***	36.650 ***	
		5	1	0.091	10.620 ***	11.450	0.077	9.650 ***	16.530 ***
		2	0	0.007	0.830	0.830	0.056	6.880 **	6.880 **
305 Korea + Singapore + The Philippines	2	0	0.173	21.100 ***	30.680 ***	0.0724	8.34	12.58	
		2	1	0.068	7.790	9.580	0.0344	3.89	4.24
		2	0	0.016	1.790	1.790	0.0032	0.35	0.35
306 Korea + Indonesia + The Philippines	2	0	0.116	13.690 ***	15.640	0.212	27.110 ***	30.610 ***	
		3	1	0.014	1.600	1.940	0.024	2.730	3.500
		2	0	0.003	0.340	0.340	0.007	0.770	0.770
307 Singapore + Indonesia + The Philippines	11	0	0.116	17.050 ***	31.270 ***	-	-	-	
		-	1	0.052	7.300	14.210 **	-	-	-
		2	0	0.049	6.910 **	6.910 **	-	-	-
308 Korea + Malaysia + The Philippines	3	0	0.241	31.380 ***	34.180 ***	0.193	25.080 ***	30.650 ***	
		4	1	0.015	1.680	2.800	0.037	4.370	5.560
		2	0	0.010	1.120	1.120	0.010	1.190	1.190
309 Singapore + Malaysia + The Philippines	2	0	0.100	11.690	17.550	-	-	-	
		-	1	0.042	4.800	5.850	-	-	-
		2	0	0.009	1.050	1.050	-	-	-
310 Indonesia + Malaysia + The Philippines	4	0	0.172	22.070 ***	26.740 **	0.110	16.030 ***	25.340 *	
		11	1	0.026	3.120	4.670	0.057	8.100 *	9.320
		2	0	0.013	1.550	1.550	0.009	1.220	1.220
311 Korea + Singapore + Thailand	9	0	0.173	25.120 ***	40.230 ***	0.2126	32.99 ***	42.06 ***	
		11	1	0.099	13.770 ***	15.110 **	0.0556	7.89	9.07
		2	0	0.010	1.340	1.340	0.0085	1.18	1.18
312 Korea + Indonesia + Thailand	3	0	0.249	32.690 ***	38.710 ***	0.166	20.680 ***	26.980 **	
		12	1	0.045	5.240	6.020	0.041	4.730	6.300
		2	0	0.007	0.790	0.790	0.014	1.570	1.570
313 Singapore + Indonesia + Thailand	4	0	0.163	20.880 ***	31.210 ***	0.142	18.350 ***	28.820 **	
		5	1	0.082	10.070 ***	10.330	0.054	6.680	10.470
		2	0	0.002	0.270	0.270	0.031	3.800	3.800

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 1)

	Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
				Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
314	Korea + Malaysia + Thailand	3	0	0.159	19.690 ***	25.770 *	0.0915	12.09 *	24.96 *
		7	1	0.046	5.370	6.080	0.078	10.23 ***	12.86 *
		2		0.006	0.710	0.710	0.0207	2.63	2.63
315	Singapore + Malaysia + Thailand	11	0	0.302	49.690 ***	62.360 ***	0.111	13.770 ***	31.800 ***
		4	1	0.082	11.760 ***	12.670 *	0.092	11.310 ***	18.030 ***
		2		0.007	0.900	0.900	0.056	6.720 **	6.720 **
316	Indonesia + Malaysia + Thailand	7	0	0.107	14.310 ***	24.970 *	0.163	21.360 ***	33.650 ***
		5	1	0.079	10.320 ***	10.660	0.075	9.390 ***	12.290 *
		2		0.003	0.350	0.350	0.024	2.900	2.900
317	Korea + The Philippines + Thailand	2	0	0.101	11.780	15.810	0.133	18.790 ***	28.800 **
		9	1	0.035	3.990	4.020	0.056	7.630	10.000
		2		0.000	0.040	0.040	0.018	2.370	2.370
318	Singapore + The Philippines + Thailand	3	0	0.087	10.420	16.750	-	-	-
		—	1	0.044	5.160	6.330	-	-	-
		2		0.010	1.160	1.160	-	-	-
319	Indonesia + The Philippines + Thailand	11	0	0.116	17.020 ***	21.520	0.059	7.140	15.070
		4	1	0.030	4.230	4.500	0.042	4.960	7.940
		2		0.002	0.270	0.270	0.025	2.970	2.970
320	Malaysia + The Philippines + Thailand	12	0	0.116	17.420 ***	28.740 **	-	-	-
		—	1	0.066	9.570 ***	11.320	-	-	-
		2		0.012	1.750	1.750	-	-	-
321	The Philippines + Thailand + China	2	0	0.094	10.900	14.130	0.154	21.080 ***	34.050 ***
		7	1	0.022	2.450	3.230	0.080	10.510 ***	12.970 *
		2		0.007	0.780	0.780	0.019	2.460	2.460
322	Malaysia + Thailand + China	4	0	0.135	16.990 ***	26.770 **	0.107	13.970 ***	27.400 **
		6	1	0.054	6.450	9.780	0.079	10.070 ***	13.430 *
		2		0.028	3.330	3.330	0.027	3.360	3.360
323	Indonesia + Thailand + China	2	0	0.095	11.030	16.190	0.187	23.610 ***	35.840 ***
		3	1	0.043	4.840	5.160	0.065	7.660	12.230 *
		2		0.003	0.320	0.320	0.039	4.570 *	4.570 *
324	Singapore + Thailand + China	11	0	0.186	28.330 ***	42.700 ***	0.215	29.000 ***	36.880 ***
		5	1	0.076	10.850 ***	14.370 **	0.038	4.580	7.870
		2		0.025	3.520	3.520	0.027	3.290	3.290
325	Korea + Thailand + China	10	0	0.105	15.020 ***	27.020 **	0.156	19.850 ***	30.590 ***
		4	1	0.060	8.300 *	12.000	0.064	7.730	10.730
		2		0.027	3.700	3.700	0.025	3.000	3.000
326	Malaysia + The Philippines + China	12	0	0.144	21.960 ***	36.220 ***	0.184	28.710 ***	39.940 ***
		12	1	0.075	11.040 ***	14.260 **	0.050	7.190	11.220
		2		0.023	3.220	3.220	0.028	4.030	4.030

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 2)

	Combination	k	H <sub>0</sub>	Currency Basket			US Dollar			
				Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace	
327	Indonesia + The Philippines + China	12	0	0.136	20.560 ***	32.420 ***	0.094	10.910	20.260	
			2	1	0.074	10.770 ***	11.870	0.053	6.080	9.360
			2	2	0.008	1.100	1.100	0.029	3.280	3.280
328	Singapore + The Philippines + China	12	0	0.125	18.790 ***	28.220 **	0.151	18.160 ***	27.990 **	
			2	1	0.037	5.330	9.430	0.054	6.120	9.830
			2	2	0.029	4.090	4.090	0.033	3.700	3.700
329	Korea + The Philippines + China	3	0	0.156	19.310 ***	26.750 **	0.067	7.750	12.270	
			2	1	0.063	7.370	7.440	0.039	4.390	4.520
			2	2	0.001	0.070	0.070	0.001	0.130	0.130
330	Indonesia + Malaysia + China	4	0	0.122	15.260 ***	24.610 *	0.156	19.810 ***	35.990 ***	
			4	1	0.045	5.420	9.340	0.102	12.600 ***	16.190 ***
			2	2	0.033	3.920	3.920	0.030	3.590	3.590
331	Singapore + Malaysia + China	3	0	0.133	16.240 ***	24.100 *	0.166	22.900 ***	34.540 ***	
			7	1	0.061	7.170	7.860	0.053	6.920	11.640
			2	2	0.006	0.680	0.680	0.037	4.730 *	4.730 *
332	Korea + Malaysia + China	3	0	0.117	14.240 ***	25.990 *	0.129	15.370 ***	21.480	
			2	1	0.075	8.870 **	11.750	0.049	5.600	6.100
			2	2	0.025	2.890	2.890	0.005	0.500	0.500
333	Singapore + Indonesia + China	2	0	0.124	14.710 ***	20.450	0.199	27.320 ***	35.330 ***	
			6	1	0.049	5.600	5.740	0.041	5.110	8.010
			2	2	0.001	0.140	0.140	0.023	2.900	2.900
334	Korea + Indonesia + China	4	0	0.091	11.180	20.920	0.150	18.540 ***	28.600 **	
			3	1	0.045	5.430	9.740	0.053	6.150	10.060
			2	2	0.036	4.310 *	4.310 *	0.034	3.920	3.920
335	Korea + Singapore + China	9	0	0.170	24.590 ***	39.550 ***	0.196	26.160 ***	36.410 ***	
			5	1	0.107	14.940 ***	14.960 **	0.059	7.320	10.260
			2	2	0.000	0.020	0.020	0.024	2.940	2.940
401	Korea + Singapore + Indonesia + Malaysia	6	0	0.249	33.500 ***	66.110 ***	0.173	21.520 ***	52.800 ***	
			5	1	0.186	24.030 ***	32.600 ***	0.150	18.410 ***	31.280 ***
			2	2	0.067	8.080 *	8.580	0.066	7.680	12.860 *
			3	3	0.004	0.490	0.490	0.045	5.190 *	5.190 *
402	Korea + Singapore + Indonesia + The Philippines	3	0	0.174	20.090 ***	40.660 *	0.110	11.810	25.080	
			2	1	0.126	14.090 ***	20.570	0.084	8.880	13.270
			2	2	0.060	6.460	6.470	0.043	4.390	4.390
			3	3	0.000	0.010	0.010	0.000	0.000	0.000
403	Korea + Singapore + Malaysia + The Philippines	3	0	0.160	18.280 ***	36.690	0.263	31.970 ***	48.150 ***	
			3	1	0.097	10.700	18.410	0.088	9.630	16.170
			2	2	0.061	6.590	7.700	0.053	5.710	6.540
			3	3	0.011	1.110	1.110	0.008	0.830	0.830

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 3)

Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
			Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
404 Korea + Indonesia + Malaysia + The Philippines	12	0	0.225	35.840 ***	67.020 ***	0.219	26.980 ***	46.950 ***
	4	1	0.115	17.160 ***	31.180 ***	0.154	18.190 ***	19.970
		2	0.078	11.410 ***	14.020 **	0.009	1.030	1.780
		3	0.018	2.620	2.620	0.007	0.750	0.750
405 Singapore + Indonesia + Malaysia + The Philippines	3	0	0.199	23.330 ***	42.420 *	-	-	-
		1	0.120	13.410 ***	19.090	-	-	-
		2	0.050	5.330	5.680	-	-	-
		3	0.003	0.350	0.350	-	-	-
406 Korea + Singapore + Indonesia + Thailand	4	0	0.227	28.120 ***	59.600 ***	0.189	24.490 ***	61.890 ***
	6	1	0.172	20.510 ***	31.480 ***	0.176	22.570 ***	37.400 ***
		2	0.090	10.250 ***	10.980	0.092	11.240 ***	14.830 **
		3	0.007	0.720	0.720	0.030	3.590	3.590
407 Korea + Singapore + Malaysia + Thailand	5	0	0.196	24.660 ***	46.200 ***	0.136	15.370	34.970
	3	1	0.100	11.850	21.540	0.088	9.630	19.600
		2	0.080	9.430 ***	9.700	0.084	9.170 ***	9.970
		3	0.002	0.270	0.270	0.008	0.790	0.790
408 Korea + Indonesia + Malaysia + Thailand	6	0	0.213	27.980 ***	50.980 ***	0.123	13.210	25.480
	2	1	0.106	13.150 ***	23.000	0.089	9.460	12.270
		2	0.079	9.590 ***	9.850	0.027	2.800	2.810
		3	0.002	0.260	0.260	0.000	0.000	0.000
409 Singapore + Indonesia + Malaysia + Thailand	4	0	0.302	39.250 ***	61.110 ***	0.214	26.240 ***	58.260 ***
	4	1	0.113	13.090 ***	21.870	0.155	18.340 ***	32.020 ***
		2	0.070	7.900	8.780	0.065	7.380	13.680 *
		3	0.008	0.880	0.880	0.056	6.300 **	6.300 **
410 Korea + Singapore + The Philippines + Thailand	4	0	0.196	23.770 ***	41.610 *	0.135	14.650	29.000
	2	1	0.104	12.010 *	17.840	0.087	9.200	14.350
		2	0.051	5.710	5.830	0.043	4.450	5.150
		3	0.001	0.120	0.120	0.007	0.700	0.700
411 Korea + Indonesia + The Philippines + Thailand	5	0	0.244	31.650 ***	45.620 **	0.207	26.180 ***	43.340 **
	5	1	0.087	10.320	13.970	0.094	11.130	17.160
		2	0.025	2.900	3.640	0.034	3.860	6.030
		3	0.007	0.740	0.740	0.019	2.170	2.170
412 Singapore + Indonesia + The Philippines + Thailand	-	0	-	-	-	-	-	-
	-	1	-	-	-	-	-	-
	-	2	-	-	-	-	-	-
	-	3	-	-	-	-	-	-
413 Korea + Malaysia + The Philippines + Thailand	3	0	0.203	23.880 ***	34.210	0.246	30.710 ***	41.410 *
	4	1	0.062	6.760	10.330	0.067	7.590	10.710
		2	0.033	3.520	3.570	0.022	2.370	3.120
		3	0.001	0.050	0.050	0.007	0.750	0.750

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 4)

	Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
				Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
414	Singapore + Malaysia + The Philippines + Thailand		0	-	-	-	-	-	-
			1	-	-	-	-	-	-
			2	-	-	-	-	-	-
			3	-	-	-	-	-	-
415	Indonesia + Malaysia + The Philippines + Thailand		0	0.209	32.110 ***	52.190 ***	-	-	-
			1	0.089	12.840 **	20.080	-	-	-
			2	0.051	7.190	7.250	-	-	-
			3	0.000	0.050	0.050	-	-	-
416	Korea + Singapore + Indonesia + China		0	0.170	24.720 ***	56.390 ***	0.209	26.420 ***	55.810 ***
			1	0.135	19.320 ***	31.660 ***	0.145	17.710 ***	29.390 ***
			2	0.089	12.330 ***	12.340 *	0.062	7.280	11.670
			3	0.000	0.010	0.010	0.038	4.400 *	4.400 *
417	Korea + Singapore + Malaysia + China		0	0.202	25.480 ***	44.240 **	0.204	25.740 ***	48.980 ***
			1	0.114	13.630 ***	18.760	0.109	12.980 **	23.230
			2	0.043	4.990	5.130	0.059	6.900	10.260
			3	0.001	0.140	0.140	0.029	3.360	3.360
418	Korea + Indonesia + Malaysia + China		0	0.176	26.590 ***	60.930 ***	0.207	28.990 ***	53.930 ***
			1	0.153	22.800 ***	34.330 ***	0.088	11.480	24.950 *
			2	0.052	7.330	11.530	0.068	8.850 **	13.470 *
			3	0.030	4.200 *	4.200 *	0.036	4.620 *	4.620 *
419	Singapore + Indonesia + Malaysia + China		0	0.254	31.900 ***	50.120 ***	0.233	30.020 ***	64.700 ***
			1	0.102	11.740	18.220	0.142	17.330 ***	34.670 ***
			2	0.052	5.840	6.480	0.112	13.470 ***	17.340 ***
			3	0.006	0.640	0.640	0.034	3.870	3.870
420	Korea + Singapore + The Philippines + China		0	0.195	23.590 ***	46.000 ***	0.213	26.080 ***	40.540 *
			1	0.130	15.130 ***	22.410	0.079	8.940	14.460
			2	0.057	6.420	7.280	0.040	4.420	5.520
			3	0.008	0.850	0.850	0.010	1.100	1.100
421	Korea + Indonesia + The Philippines + China		0	0.102	10.910	22.510	0.171	22.640 ***	50.450 ***
			1	0.062	6.440	11.600	0.141	18.360 ***	27.810 **
			2	0.050	5.150	5.160	0.043	5.300	9.440
			3	0.000	0.010	0.010	0.034	4.140	4.140
422	Singapore + Indonesia + The Philippines + China		0	0.167	25.810 ***	50.010 ***	0.169	18.680 ***	37.640
			1	0.109	16.290 ***	24.200 *	0.095	10.030	18.970
			2	0.046	6.640	7.910	0.051	5.320	8.930
			3	0.009	1.270	1.270	0.035	3.610	3.610
423	Korea + Malaysia + The Philippines + China		0	0.189	22.030 ***	35.190	0.232	27.710 ***	42.480 *
			1	0.079	8.630	13.160	0.093	10.250	14.770
			2	0.042	4.520	4.530	0.034	3.630	4.520
			3	0.000	0.010	0.010	0.009	0.890	0.890

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 5)

Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
			Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
424 Singapore + Malaysia + The Philippines + China	2	0	0.123	13.210	26.170	-	-	-
	-	1	0.069	7.180	12.960	-	-	-
	-	2	0.056	5.770	5.770	-	-	-
	-	3	0.000	0.000	0.000	-	-	-
425 Indonesia + Malaysia + The Philippines + China	11	0	0.171	25.720 ***	52.340 ***	0.185	21.420 ***	42.940 **
	3	1	0.102	14.800 ***	26.620 **	0.094	10.340	21.520
	-	2	0.073	10.310 ***	11.820	0.074	8.060	11.180
	-	3	0.011	1.510	1.510	0.029	3.120	3.120
426 Korea + Singapore + Thailand + China	8	0	0.193	26.840 ***	46.630 ***	0.220	32.060 ***	63.220 ***
	9	1	0.122	16.300 ***	19.800	0.137	18.990 ***	31.170 ***
	-	2	0.027	3.360	3.500	0.051	6.690	12.180
	-	3	0.001	0.140	0.140	0.042	5.480 **	5.480 **
427 Korea + Indonesia + Thailand + China	4	0	0.174	20.880 ***	37.280	0.205	26.840 ***	59.520 ***
	6	1	0.091	10.360	16.400	0.157	19.980 ***	32.680 ***
	-	2	0.053	5.930	6.040	0.067	8.050	12.700 *
	-	3	0.001	0.110	0.110	0.039	4.650 *	4.650 *
428 Singapore + Indonesia + Thailand + China	10	0	0.215	32.180 ***	49.430 ***	0.268	35.230 ***	57.830 ***
	5	1	0.081	11.230	17.250	0.079	9.330	22.600
	-	2	0.044	6.010	6.020	0.076	8.960 **	13.270 *
	-	3	0.000	0.010	0.010	0.038	4.310 *	4.310 *
429 Korea + Malaysia + Thailand + China	2	0	0.129	13.980	29.600	0.223	27.460 ***	47.770 ***
	4	1	0.097	10.320	15.620	0.117	13.550 ***	20.310
	-	2	0.047	4.850	5.290	0.045	5.010	6.760
	-	3	0.004	0.440	0.440	0.016	1.760	1.760
430 Singapore + Malaysia + Thailand + China	2	0	0.131	14.220	25.730	0.254	33.120 ***	53.300 ***
	5	1	0.078	8.170	11.510	0.093	10.960	20.170
	-	2	0.033	3.340	3.350	0.043	4.940	9.210
	-	3	0.000	0.010	0.010	0.037	4.270 *	4.270 *
431 Indonesia + Malaysia + Thailand + China	11	0	0.178	26.770 ***	54.220 ***	0.237	32.780 ***	68.940 ***
	7	1	0.130	19.030 ***	27.450 **	0.152	19.980 ***	36.170 ***
	-	2	0.054	7.620	8.420	0.102	12.970 ***	16.180 ***
	-	3	0.006	0.800	0.800	0.026	3.210	3.210
432 Korea + The Philippines + Thailand + China	3	0	0.109	12.100	22.670	0.217	26.690 ***	41.600 *
	4	1	0.071	7.690	10.570	0.085	9.680	14.900
	-	2	0.021	2.250	2.880	0.035	3.900	5.220
	-	3	0.006	0.620	0.620	0.012	1.320	1.320
433 Singapore + The Philippines + Thailand + China	2	0	0.118	12.690	22.150	0.201	23.600 ***	46.330 ***
	3	1	0.069	7.170	9.460	0.108	11.980 *	22.720
	-	2	0.022	2.290	2.290	0.055	5.920	10.740
	-	3	0.000	0.000	0.000	0.045	4.820 *	4.820 *

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%



Table 2: Johansen tests (continued: 6)

	Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
				Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
434	Indonesia + The Philippines + Thailand + China	12	0	0.172	26.530 ***	46.640 ***	0.259	42.240 ***	76.360 ***
			1	0.068	9.960	20.110	0.117	17.590 ***	34.120 ***
			2	0.050	7.230	10.150	0.088	13.030 ***	16.530 ***
			3	0.021	2.920	2.920	0.025	3.500	3.500
435	Malaysia + The Philippines + Thailand + China	3	0	0.146	22.270 ***	53.430 ***	0.199	23.230 ***	53.030 ***
			1	0.122	18.290 ***	31.160 ***	0.167	19.170 ***	29.810 ***
			2	0.046	6.650	12.870 *	0.066	7.140	10.640
			3	0.043	6.220 **	6.220 **	0.033	3.510	3.510
501	Korea + Singapore + Indonesia + Malaysia + The Philippines	3	0	-	-	-	0.271	30.350 ***	61.880 *
			1	-	-	-	0.148	15.410	31.540
			2	-	-	-	0.107	10.870	16.130
			3	-	-	-	0.050	4.960	5.260
			4	-	-	-	0.003	0.300	0.300
502	Korea + Singapore + Indonesia + Malaysia + Thailand	3	0	0.205	21.960 ***	59.440 *	-	-	-
			1	0.167	17.520 ***	37.480	-	-	-
			2	0.118	12.100 *	19.950	-	-	-
			3	0.073	7.310	7.860	-	-	-
			4	0.006	0.550	0.550	-	-	-
503	Korea + Singapore + Indonesia + The Philippines + Thailand	5	0	0.307	38.880 ***	73.870 ***	0.273	29.040 ***	68.010 ***
			1	0.159	18.310 ***	34.980	0.211	21.580 ***	38.970
			2	0.094	10.490	16.680	0.108	10.420	17.390
			3	0.054	5.930	6.190	0.063	5.930	6.960
			4	0.002	0.260	0.260	0.011	1.030	1.030
504	Korea + Singapore + Malaysia + The Philippines + Thailand	-	0	-	-	-	-	-	-
			1	-	-	-	-	-	-
			2	-	-	-	-	-	-
			3	-	-	-	-	-	-
			4	-	-	-	-	-	-
505	Korea + Indonesia + Malaysia + The Philippines + Thailand	2	0	0.241	25.030 ***	57.630	0.284	32.050 ***	63.060 **
			1	0.178	17.850 ***	32.600	0.174	18.290 ***	31.010
			2	0.111	10.720	14.750	0.080	8.040	12.720
			3	0.040	3.720	4.030	0.041	3.970	4.680
			4	0.003	0.310	0.310	0.008	0.720	0.720
506	Singapore + Indonesia + Malaysia + The Philippines + Thailand	-	0	-	-	-	-	-	-
			1	-	-	-	-	-	-
			2	-	-	-	-	-	-
			3	-	-	-	-	-	-
			4	-	-	-	-	-	-

k: lag length, upper is for the currency basket, lower is for the US dollar  
 \*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 7)

Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
			Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
507 Korea + Singapore + Indonesia + Malaysia + China	7	0	0.272	36.880 ***	68.570 ***	0.318	44.360 ***	104.470 ***
	7	1	0.154	19.360 ***	31.680	0.256	34.330 ***	60.110 ***
		2	0.058	6.950	12.320	0.123	15.180 ***	25.780 *
		3	0.040	4.720	5.370	0.057	6.770	10.600
		4	0.006	0.650	0.650	0.033	3.830	3.830
508 Korea + Singapore + Indonesia + The Philippines + China	3	0	0.182	19.250	45.640	0.370	41.980 ***	74.780 ***
	2	1	0.133	13.750	26.390	0.163	16.200 **	32.810
		2	0.091	9.110	12.640	0.114	11.040	16.610
		3	0.036	3.510	3.530	0.059	5.560	5.560
		4	0.000	0.010	0.010	0.000	0.010	0.010
509 Korea + Singapore + Malaysia + The Philippines + China	3	0	0.176	18.590	47.260	0.286	32.280 ***	73.350 ***
	3	1	0.150	15.600	28.670	0.198	21.220 ***	41.080 *
		2	0.071	7.080	13.070	0.104	10.560	19.860
		3	0.061	5.990	5.990	0.090	9.000 **	9.300
		4	0.000	0.000	0.000	0.003	0.300	0.300
510 Korea + Indonesia + Malaysia + The Philippines + China	3	0	0.170	17.880	45.580	0.315	38.270 ***	73.340 ***
	4	1	0.149	15.430	27.700	0.157	17.230 ***	35.070
		2	0.083	8.340	12.270	0.113	12.070 *	17.840
		3	0.039	3.780	3.930	0.052	5.360	5.770
		4	0.002	0.150	0.150	0.004	0.410	0.410
511 Singapore + Indonesia + Malaysia + The Philippines + China	-	0	-	-	-	0.217	23.490 ***	69.110 ***
	3	1	-	-	-	0.196	20.890 ***	45.620 **
		2	-	-	-	0.151	15.740 ***	24.730 *
		3	-	-	-	0.052	5.150	8.990
		4	-	-	-	0.039	3.840	3.840
512 Korea + Singapore + Indonesia + Thailand + China	6	0	0.292	38.350 ***	68.820 ***	0.273	35.410 ***	89.860 ***
	6	1	0.146	17.480 ***	30.470	0.224	28.170 ***	54.450 ***
		2	0.078	9.000	12.990	0.151	18.160 ***	26.280 *
		3	0.033	3.760	3.990	0.054	6.120	8.130
		4	0.002	0.230	0.230	0.018	2.010	2.010
513 Korea + Singapore + Malaysia + Thailand + China	3	0	0.192	20.500 **	50.760	0.324	41.540 ***	64.950 **
	5	1	0.162	16.920 ***	30.270	0.087	9.690	23.410
		2	0.106	10.750	13.350	0.065	7.160	13.720
		3	0.027	2.600	2.600	0.051	5.580	6.560
		4	0.000	0.010	0.010	0.009	0.990	0.990
514 Korea + Indonesia + Malaysia + Thailand + China	3	0	0.207	22.250 ***	49.770	0.330	42.470 ***	85.280 ***
	5	1	0.125	12.860	27.520	0.212	25.270 ***	42.810 **
		2	0.098	9.850	14.660	0.091	10.110	17.550
		3	0.049	4.800	4.810	0.049	5.330	7.430
		4	0.000	0.010	0.010	0.020	2.100	2.100

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 8)

Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
			Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
515 Singapore + Indonesia + Malaysia + Thailand + China	2	0	0.238	24.750 ***	54.450	0.336	43.340 ***	92.730 ***
	5	1	0.168	16.690 **	29.700	0.209	24.850 ***	49.390 ***
		2	0.092	8.820	13.010	0.124	14.030 ***	24.530 *
		3	0.042	3.860	4.190	0.061	6.680	10.500
		4	0.004	0.330	0.330	0.036	3.830	3.830
516 Korea + Singapore + The Philippines + Thailand + China	2	0	0.262	27.620 ***	56.670	0.342	42.190 ***	64.070 **
	4	1	0.166	16.570 **	29.040	0.095	10.100	21.870
		2	0.106	10.240	12.480	0.064	6.650	11.780
		3	0.024	2.230	2.240	0.048	5.010	5.120
		4	0.000	0.000	0.000	0.001	0.110	0.110
517 Korea + Indonesia + The Philippines + Thailand + China	2	0	0.289	31.000 ***	59.780 *	0.348	38.930 ***	76.710 ***
	2	1	0.161	15.930 *	28.770	0.193	19.560 ***	37.780
		2	0.106	10.150	12.850	0.117	11.310	18.220
		3	0.023	2.130	2.700	0.071	6.740	6.910
		4	0.006	0.570	0.570	0.002	0.170	0.170
518 Singapore + Indonesia + The Philippines + Thailand + China	-	0	-	-	-	0.327	35.960 ***	78.110 ***
	2	1	-	-	-	0.203	20.610 ***	42.140 *
		2	-	-	-	0.135	13.230 ***	21.540
		3	-	-	-	0.048	4.450	8.310
		4	-	-	-	0.042	3.860	3.860
519 Korea + Malaysia + The Philippines + Thailand + China	-	0	-	-	-	0.306	35.010 ***	74.980 ***
	3	1	-	-	-	0.181	19.120 ***	39.970 *
		2	-	-	-	0.118	12.040 *	20.840
		3	-	-	-	0.086	8.590 *	8.810
		4	-	-	-	0.002	0.220	0.220
520 Singapore + Malaysia + The Philippines + Thailand + China	-	0	-	-	-	-	-	-
	-	1	-	-	-	-	-	-
		2	-	-	-	-	-	-
		3	-	-	-	-	-	-
		4	-	-	-	-	-	-
521 Indonesia + Malaysia + The Philippines + Thailand + China	3	0	0.227	24.730 ***	50.960	0.284	33.790 ***	74.830 ***
	4	1	0.151	15.710 *	26.220	0.173	19.200 ***	41.040 *
		2	0.085	8.530	10.510	0.111	11.910 *	21.840
		3	0.020	1.970	1.980	0.061	6.380	9.930
		4	0.000	0.010	0.010	0.035	3.550	3.550
601 Korea +Singapore+ Indonesia+ Malaysia+ The Philippines+ Thailand	-	0	-	-	-	-	-	-
	-	1	-	-	-	-	-	-
		2	-	-	-	-	-	-
		3	-	-	-	-	-	-
		4	-	-	-	-	-	-
5	-	-	-	-	-	-		

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 2: Johansen tests (continued: 9)

	Combination	k	H <sub>0</sub>	Currency Basket			US Dollar		
				Eigen Vector	L- Max	L- Trace	Eigen Vector	L- Max	L- Trace
602	Korea + Singapore + Indonesia + Malaysia + The Philippines + China	3	0	0.320	33.530 ***	86.370 **	0.340	36.130 ***	110.700 ***
			1	0.271	27.460 ***	52.840	0.295	30.350 ***	74.560 ***
			2	0.144	13.520	25.380	0.231	22.900 ***	44.220 **
			3	0.094	8.630	11.860	0.161	15.230 ***	21.320
			4	0.033	2.940	3.230	0.065	5.800	6.100
603	Korea + Singapore + Indonesia + Malaysia + Thailand + China	5	0	0.386	39.490 ***	83.710 *	0.465	61.830 ***	126.570 ***
			1	0.246	22.890 ***	44.220	0.238	26.880 ***	64.740 **
			2	0.156	13.770	21.330	0.167	18.090 ***	37.860
			3	0.063	5.230	7.570	0.126	13.330 ***	19.770
			4	0.028	2.330	2.340	0.063	6.400	6.440
604	Korea + Singapore + Indonesia + The Philippines + Thailand + China	4	0	0.390	39.980 ***	84.400 *	0.419	50.500 ***	116.500 ***
			1	0.255	23.870 ***	44.410	0.271	29.380 ***	66.000 **
			2	0.141	12.350	20.540	0.207	21.550 ***	36.620
			3	0.073	6.170	8.190	0.096	9.430	15.070
			4	0.024	1.990	2.020	0.057	5.450	5.650
605	Korea + Singapore + Malaysia + The Philippines + Thailand + China	3	0	-	-	-	0.361	39.000 ***	113.920 ***
			1	-	-	-	0.313	32.690 ***	74.930 ***
			2	-	-	-	0.236	23.470 ***	42.230 *
			3	-	-	-	0.125	11.620	18.770
			4	-	-	-	0.079	7.110	7.150
606	Korea + Indonesia + Malaysia + The Philippines + Thailand + China	4	0	-	-	-	0.343	39.080 ***	119.190 ***
			1	-	-	-	0.322	36.140 ***	80.110 ***
			2	-	-	-	0.226	23.860 ***	43.970 **
			3	-	-	-	0.121	12.000 *	20.110
			4	-	-	-	0.083	8.050	8.110
607	Singapore + Indonesia + Malaysia + The Philippines + Thailand + China	4	0	-	-	-	0.445	54.730 ***	126.580 ***
			1	-	-	-	0.259	27.820 ***	71.850 ***
			2	-	-	-	0.213	22.270 ***	44.030 **
			3	-	-	-	0.111	10.980	21.760
			4	-	-	-	0.081	7.880	10.790
701	Korea + Singapore + Indonesia + Malaysia + The Philippines + Thailand + China	3	0	-	-	-	0.420	42.480 ***	147.440 ***
			1	-	-	-	0.387	38.170 ***	104.950 ***
			2	-	-	-	0.311	29.070 ***	66.790 ***
			3	-	-	-	0.248	22.270 ***	37.720
			4	-	-	-	0.127	10.580	15.450
			5	-	-	-	0.060	4.800	4.870
6	-	-	-	0.001	0.070	0.070			

k: lag length, upper is for the currency basket, lower is for the US dollar

\*95%, \*\*97.5%, \*\*\*99.0%

Table 4: Summary of Empirical Analysis

Number of Countries in the Currency Area	Currency Basket							
	Korea(Won)	Singapore(\$SG)	Malaysia(Ringgit)	The Philippines(Peso)	Thailand(Baht)	Indonesia(Rupiah)	China(Yuan)	
3		○			○	○		
		○	○		○			
		○			○		○	
4	○	○					○	
	○		○	○		○		
	○	○			○	○		
	○		○			○	○	
	○	○			○		○	

		○				○	○	○	○
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U.S. dollar

	Korea(Won)	Singapore(\$SG)	Malaysia(Ringgit)	The Philippines(Peso)	Thailand(Baht)	Indonesia(Rupiah)	China(Yuan)
4		○	○		○	○	