The Influence of Introducing Common Currency for Trade and Employment in APEC: An Empirical Analysis*

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Abstract

There is little possibility that APEC will abolish individual currencies and introduce a common currency. However, in APEC, economic integration is ongoing in many fields. Intra-trade in APEC has been increasing according to some measures of elimination of trade barriers and tariffs in addition to economic growth in some countries. Some countries have recently entered into Free Trade Agreements (FTA). "Asian bonds" have been discussed in some countries. Other countries have stated the possibility of an "Asian Currency Unit" (ACU) like the former European Currency Unit (ECU), or common currency itself. Given these situations, this paper analyzes the influence of introducing common currency in APEC for trade and employment. First, the study uses empirical analysis to determine that there is a reduction of exchange rate variability and proximity. Second, this paper confirms that the development of intra-trade has been producing similar economic conditions in member states. This movement seems to satisfy in APEC one of the theories of "optimum currency area" (OCA) presented by Mundell (1961), Kenen (1969), and McKinnon (1963). Finally, this paper analyzes the motivation for abandoning domestic currencies. In real markets and in academic fields, some economists are doubtful that abolishing domestic currency and introducing a common currency is a rational choice, especially for large countries. In the EU, some countries (e.g., Germany, France, Italy) had strong currencies and have been doubtful about introducing the Euro as a common currency. Some countries in APEC have strong currencies, so they will be against the currency

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integration not only for political, cultural, and historical reasons but also for economic reasons. For example, the U.S. will be strongly against abolishing the U.S. dollar and introducing a common currency. However, this paper analyzes the possibility and finds that employment is strongly related to the movement for abolishment of each currency. Employment is one important key point for the success in introducing a common currency. The situation of the EU also suggests that relationship.

I. Introduction

After World War II, the General Agreement on Tariffs and Trade (GATT) contributed to worldwide growth through international trade. However, two problems have occurred. New types of difficulties and new types of trade policies have appeared. First, service trade, intellectual property rights, investment, and non-tariff barriers are examples and are basically not included in the GATT agreement. These matters cannot be handled under the GATT framework. The second matter is the formation of bloc economy. EC (EU), EFTA, NAFTA, MERCOSUR, APEC, and FTA are typical examples. These trends have not changed largely since the GATT became the World Trade Organization (WTO). Some important problems still exist without solutions.

Since the beginning of the 1970s, the exchange rate system has changed dramatically. Almost all developed countries have changed the exchange rate system from fixed exchange rates to a floating rate system. However, it should be noted that the exchange rate fluctuations have been larger than expected. The fear of trade reductions resulting from large exchange rate fluctuations has appeared. In the EU, the common currency (Euro) was introduced in 1999. One of the purposes was to avoid excessive exchange rate fluctuations. The CFA Franc Zone and the East Caribbean Currency Area are real examples of currency unions.

This paper's purpose is to analyze the effect of introducing common

currency on trade and employment in APEC. There is little possibility that APEC will introduce a common currency. The possibility seems to be almost zero in reality. However, in APEC, economic integration is ongoing. Intra-trade in APEC has been increasing according to elimination of trade barriers and tariffs as well as rapid economic growth in some countries. For financial fields, the effectiveness of Asian bonds or an "Asian Currency Unit" (ACU), like the former European Currency Unit (ECU), has being disputed by some countries. A few proposals have been presented by some economists and politicians (e.g., Madhur, 2001). This paper analyzes first whether there is a reduction of exchange rate variability and proximity. Second, this paper focuses on whether or not the development of intra-trade has been producing similar economic conditions in member states. This movement verifies the theory of "optimum currency area" (OCA) presented by Mundell (1961), McKinnon (1963), and Kenen (1995) in APEC. Finally, this paper analyzes the motivation for abandoning domestic currencies. In real markets and academic fields, some economists are doubtful that abolishing domestic currencies and introducing a common currency is a rational choice for large countries. In the EU, some countries (e.g., Germany, France, Italy) had strong currencies and have been doubtful about introducing a common currency, Euro. Some APEC countries have strong currencies, like the U.S. dollar and Japanese yen, so they will be strongly against currency integration not only for political, cultural, and historic reasons, but also for economic reasons. Employment will be one important key point, as indicated by the experience of the EU.

Ⅱ. Exchange rate and International Trade in APEC

2.1 Stability of Exchange Rate

The exchange rate and its fluctuations influence economic activity and

trade all over the world. APEC countries are not exceptions. This section first verifies exchange rate fluctuations. In general, large exchange rate fluctuations reduce international trade. Table 1 shows exchange rate fluctuations for each APEC country. The figures are the standard deviation of nominal effective exchange rate. A one-month difference is adopted for each time. The weight is calculated by intra-trade volume (export plus import) in APEC. The sample period is from 1990 to 1995 and 1998 to 2004[1]. The table shows that the deviation is decreasing.

The decrease is not very dramatic. However, we should note that some countries have changed exchange rate systems from fixed to floating. In 1997, the Asian currency crisis created a major economic turmoil. Considering these facts, we can say that exchange rate fluctuations have reduced.

Table 1. Standard Errors of Deviation of Nominal Effective Exchange Rates

	1990-1995	1998-2004
Indonesia	5.86	77.75
Malaysia	0.19	0.14
Philippine	0.37	0.19
Singapore	0.07	0.19
Thailand	0.05	0.09
Vietnam	56.05	32.25
Japan	0.45	0.40
Korea	2.14	4.50
China	0.43	0.13
Mexico	0.06	0.05
Papua New Guinea	0.54	0.44
Australia	0.27	0.26
New Zealand	0.001	0.001
United States	0.17	0.20
Canada	0.15	0.18
Peru	0.01	0.009
Chile	0.23	0.25

Table 2 shows the same standard errors of deviation in the nominal exchange rate against the U.S. dollar and Japanese yen.

Table 2. Standard Errors of Deviation of Nominal Exchange Rate against the U.S. Dollar and Japanese Yen.

	U.S. Dollar		Japanese Yen	
	1990-1996	1998-2004	1990-1996	1998-2004
Indonesia	0.41	59.79	0.08	0.53
Malaysia	0.004	0	8.73E-05	0.0001
Philippine	0.08	0.12	0.001	0.001
Singapore	0.002	0.002	4.44E-05	4.02E-05
Thailand	0.02	0.10	0.0008	0.001
Vietnam	32.60	4.62	0.46	0.43
Japan	0.45	0.38		
Korea	0.54	3.42	0.03	0.03
China	0.04	8.51E-05	0.0005	0.0002
Mexico	0.04	0.03	0.0004	0.0003
Papua New Guinea	0.002	0.001	4E-05	2.13E-05
Australia	0.002	0.002	2.72E-05	3.11E-05
New Zealand	0.001	0.002	2.77E-05	2.69E-05
United States			0.002	0.002
Canada	0.002	0.003	5.12E-05	4.12E-05
Peru	0.007	0.004	0.001	0.002
Chile	0.79	2.15	0.01	0.02

Both tables show that the fluctuations have been decreasing.

Next, equation (1) is estimated empirically. The equation is based on Frankel and Wei (1995). The equation shows that what currency affects the APEC currencies.

$$\Delta \text{ each currency} = \alpha + \beta_1 \Delta \text{ U.S. dollar} + \beta_2 \Delta \text{ Japanese yen} \quad \cdots(1)$$

The exchange rate is against the Swiss franc to avoid n-1 problem. The time span is from 1998 to 2004. In 1997, Asian currency crisis occurred, so

Table 3. Effects of Major Currencies for Each Country

	constant	U.S. dollar	Yen	D.W.	F value	adj.R^2
Indonesia	76.86	117.14	30.76	1.97	105.83	0.54
	(1.03)	(3.25)	(1.78)			
Malaysia	-0.08	0.83	0.14	1.31	733.70	0.89
	(-0.46)	(9.83)	(3.38)			
Philippine	-0.36	0.67	0.10	1.11	349.51	0.80
	(-1.78)	(6.90)	(2.21)			
Singapore	0.13	0.82	0.17	1.51	1790.35	0.95
	(1.09)	(14.44)	(6.22)			
Thailand	0.18	0.55	0.09	1.68	365.24	0.80
	(1.08)	(6.89)	(2.43)			
Vietnam	87.06	-99.13	-16.69	2.15	24.40	0.21
	(3.38)	(-5.57)	(-2.50)			
Japan	-0.096	1.97		1.95	1353.81	0.88
	(-0.30)	(36.79)				
Korea	4.79	9.19	5.03	2.01	196.60	0.69
	(0.81)	(3.20)	(3.66)			
China	-0.29	0.88	0.11	2.61	748.71	0.89
	(-1.70)	(10.50)	(2.82)			
Mexico	0.08	0.12	0.04	1.67	442.60	0.83
	(2.01)	(5.82)	(4.48)			
Papua New	-0.55	1.16	-0.12	1.18	183.57	0.67
Guinea	(-1.87)	(8.23)	(-1.84)			
Australia	0.11	0.89	0.25	1.45	824.11	0.90
	(0.54)	(8.91)	(5.13)			
New	0.0003	0.0030	0.001	1.74	601.01	0.87
Zealand	(0.30)	(7.05)	(4.94)			
U.S.	-0.88		0.45	1.82	1353.81	0.88
	(-0.09)		(36.79)			
Canada	0.009	0.82	0.28	1.39	1084.94	0.92
	(0.05)	(9.44)	(6.68)			
Chile	0.16	0.90	0.06	1.27	887.40	0.91
	(1.09)	(12.62)	(1.83)			
Russia	-3.87	1.23	0.02	1.42	18.28	0.21
	(-2.64)	(1.70)	(0.05)			

those periods should be also excluded to avoid the turmoil. The result is shown in Table 3.

The result is clear. The effects from the U.S. dollar and Japanese yen are strong and robust.

2.2 Exchange Rate and International Trade

This section analyzes the relationship between exchange rate fluctuations and international trade. If the introduction of common currency was performed[2], exchange rate movement and fluctuation would be extinguished among the countries that adopted the same currency. It is therefore important to confirm the situation.

In traditional theory, trade volume is usually determined by exchange rate, relative price, quality, and service, and so on. However, other factors are also important. For example, economic scale, distance, adjacent, and language are also deterministic elements in reality. Such factors should be carefully examined because the explanation variables are co-related with each other when estimating the equation empirically. Equation (2) is estimated based on these factors.

$$\log(T_{ij}) = \alpha + \beta_1(\text{exstd}) + \beta_2\log(\text{GDPi} * \text{GDPj}) + \beta_3\log(\text{GDPi/pop} * \text{GDPj/pop}) + \beta_4\log(\text{distance}) + \beta_5(\text{adjacent}) + \beta_6\text{language} + u_{ij} \cdots (2)$$

T_{ij} is the trade volume between country i and country j. The second term of right-hand 'exstd' is the standard deviation of the residual from the AR1 regression. It produces the estimated autoregressive coefficient in an AR1 regression for the log of the nominal exchange rate of country i to country j[3]. Pop means population. Distance is the distance between that country's capital and another. Adjacency is a country's land adjacency. The data are quarterly. The result is shown in Table 4.

The results are almost clear. Almost all of the coefficients of exchange

Table 4. Deterministic Elements of International Trade

	Exstd	GDP	GDP per Capita	Distance	Adjacent	Language	D.W.	F value	adj.R^2
1995	-0.35	0.30	0.98	-0.88	1.02	0.34	2.20	100.52	0.92
	(-6.85)	(7.68)	(4.69)	(-4.42)	(1.92)	(2.34)			
2000	-0.084	0.31	0.66	-0.53	0.62	0.36	2.34	65.33	0.90
	(-1.08)	(7.88)	(3.22)	(-1.49)	(1.15)	(2.94)			
2003	0.044	0.34	0.59	-0.10	0.16	0.30	1.98	70.24	0.88
	(1.02)	(10.24)	(2.94)	(-3.90)	(0.41)	(2.12)			

rate fluctuation are negative as expected. However, the recent value is not significant. There may be some possibility that the development of forward/future and option transactions contributed to the results, as they can avoid exchange rate fluctuations quite easily. Other results can be derived from the table. The expansion of economic transactions contributes positively to the trade volume. The relationship between distance and trade is negative, the relationship between adjacency and trade is positive, and the relationship between the same language and trade is positive. However, the effects seem to be decreasing. Some coefficients are not significant. Improvements in transportation and information technology may contributed in APEC countries as they have elsewhere.

Ⅲ. International Trade and Economic Structure

Gains from a currency union, which reflect an increase in efficiency, arise primarily from two sources. The first is that a common currency eliminates transaction costs that are usually incurred when trade and investment transactions require currency conversion. Second, a common currency eliminates risk from uncertainty in the movements of exchange rate between trading partners. One additional gain is that a currency union provides the potential for reinforcing fiscal discipline and

credibility of monetary policy.

On the other hand, the disadvantages are obvious. They relate to the loss of two important macroeconomic adjustment tools, namely independent monetary and exchange rate policies. The member country must abide by common monetary policy for the union as a whole; and it has to relinquish its exchange rate, an instrument for protecting itself from economic shocks. However, the costs are less severe if the shocks affect all member countries in the union in a similar fashion, and a common monetary and exchange rate policy *vis-a vis* with the rest of the world would then be appropriate. On the other hand, if shocks are asymmetric in nature and affect the countries in a dissimilar manner (for example, due to reasons such as different industrial structures), a common policy would be the least desirable.

Section 2 analyzed the deterministic factors of international trade. In APEC, international trade is increasing and will surely increase in the future. Does the movement suggest specific economic structures in each country? Or does it engender homogenous economic structures? When introducing common currency, this point is important for judging whether the country will derive benefit from using a common currency. From the theoretical viewpoint of OCA, more international trade may result in either tighter or looser correlations of business cycles. For example, if countries become more specialized in the goods in which they have comparative advantage, as noted by Krugman (1993), more trade will cause the business cycles of countries to diverge. Alternatively, if demand shocks and intra-industry trade dominate, then more trade will cause the business cycles to become more similar.

The empirical method here is related to OCA theory. One of the theories states that if similarities of business cycles or shocks exist, common currency would be preferable. As Kenen (1969) discussed, it is natural to ask whether members of common currency areas are more specialized

and therefore potentially more vulnerable to asymmetric industry shocks. Kose, Prasad, and Terrones (2003) said that globalization does not necessarily lead to an increase in the degree of synchronization of business cycles. Eichengreen and Bayoumi (1996) likewise uncovered a positive economic relationship between Asian-Pacific trade and intraregional business cycles. Frankel and Rose (1997, 1998) claimed that countries that trade closely and intensively with one another tend to have high correlations in their business cycles.

This section relies on Frankel and Rose (1996). The estimated equation is as follows (3).

$$\log(Corr_{ij}) = \alpha + \beta \log(Trade_{ij}) + u_{ij} \quad \cdots(3)$$

The dependent variable stands for the correlation of economic activity. It is the average of the past year using quarterly data. This paper uses industrial production and gross domestic product (GDP) as indicators of economic activity. They are de-trended. The term *Trade* means trade intensity. Trade volume between country i and country j is divided by the total APEC trade volume. The data are quarterly[4]. If the coefficient β is negative, the adoption of common currency is insignificant. A positive coefficient suggests that common currency may be appropriate. The result is show in Table 5.

The result is quite interesting. The coefficient is positive. Form the view of OCA theory, currency integration should be appropriate and

Table 5. International Trade and Economic Structure

	Constant	β	D.W.	F value	adj.R^2
Industrial Production	20.55 (5.08)	0.62 (18.22)	2.20	160.40	0.94
GDP	20.28 (4.98)	0.59 (16.55)	2.19	157.71	0.93

should be promoted[5].

IV. Fluctuations of Exchange Rate and Employment

The above analysis shows that adopting common currency in APEC is reasonable. However, large countries will not wish to abolish their own currency. Surely absorbing weak currency will not confer benefits for countries with strong economies, which also prefer to decide monetary policy by their own without considering weak economic countries. However, we should consider another important factor.

In 1999, the Euro was first introduced in Europe. The movement is proceeding very smoothly. However, ratification of the EU constitution by each country is still difficult for the governments of large countries. There are several reasons, and the largest difficulty for economic and monetary integration is employment. Workers in some large countries are beginning to lose their jobs because a lot of people from weak economic countries are coming into large countries to seek jobs. Employment is one important point to the success of introducing common currency union.

This section verifies this point empirically. The estimated equation is based on Gros (1996) as follows:

$$UNE = \alpha + \beta_1 UNE(-1) + \beta_2 UNE(-2) + \gamma EXC(-1) + u \quad \cdots(4)$$

UNE is the unemployment rate. EXC is the standard deviation of the change of exchange rate. The calculation method is the same as in equation (2). ( ) is a time lag. The sample period is from 1985 to 2004. The result is shown in Table 6.

The results show that a change in exchange rates affects unemployment. This point is very important. In the EU, some large and wealthy

Table 6. Unemployment and Exchange Rate

	Coefficient	T value
Constant	2.08	20.66
UNE(-1)	0.78	7.43
UNE(-2)	-0.18	-4.25
EXC(-1)	0.40	3.76

adj.R^2: 0.90; D.W.: 2.18; F value: 56.71

countries fear that unemployment would increase following adoption of a common currency. At least, the decrease in exchange rate fluctuations contributes to the increase in employment. Adopting a common currency benefits employment.

Table 7. Unemployment and Exchange Rate with Capital Formation

	Constant	UNE(-1)	UNE(-2)	EXC(-1)	FCF(-1)	D.W.	F value	adj.R^2
Malaysia	3.58	0.22	-0.27	0.44	3.93E-06	1.93	0.87	0.11
	(3.29)	(1.06)	(-1.39)	(3.52)	(0.47)			
Philippine	10.60	-0.21	-0.26	0.36	0.03	2.24	9.27	0.38
	(5.95)	(-1.51)	(-2.03)	(3.37)	(5.10)			
Japan	-0.20	1.00	-0.04	0.19	3.03E-06	1.96	238.27	0.94
	(-0.20)	(6.43)	(-0.28)	(1.54)	(0.49)			
Korea	-0.32	1.12	-0.24	0.52	1.91E-05	1.93	60.97	0.80
	(-0.58)	(7.54)	(-1.65)	(6.85)	(1.68)			
China	-0.23	1.42	-0.46	0.12	0.006	1.94	286.43	0.95
	(-0.54)	(9.50)	(-2.99)	(3.98)	(1.26)			
Australia	1.39	0.71	0.17	0.32	-0.004	2.02	120.53	0.82
	(2.06)	(6.25)	(1.40)	(4.38)	(-1.82)			
New Zealand	2.67	0.98	-0.16	0.17	-0.0003	1.96	316.39	0.94
	(2.79)	(7.73)	(-1.24)	(3.02)	(-2.98)			
United States	0.98	0.49	0.37	0.24	-0.0001	1.90	87.30	0.77
	(1.67)	(4.53)	(3.45)	(3.00)	(-0.83)			
Canada	6.06	0.40	0.15	-0.008	-0.013	2.12	52.92	0.79
	(3.09)	(2.58)	(1.06)	(-0.12)	(-2.72)			
Chile	3.40	0.82	-0.21	0.39	-0.0002	1.58	8.92	0.46
	(1.53)	(3.74)	(-0.92)	(4.50)	(-0.23)			

Finally, the same method is applied to each country. This computation uses equation (4) but adds the rate of fixed capital formation. The result is shown in Table 7.

Fixed capital formation has some effect on the outcome. If this is uncertain, it will affect exchange rate movement. The results are inadequate; however, employment rates are important factors and should be a central concern when considering the adoption of a common currency. Policy authorities should take this into account. In particular, if greater international competition leads to layoffs and associated labor market pressures, there could be an increase in pleas for continuation or enlargement of the social safety net.

V. Conclusion

This paper's purpose was to analyze the effect of introducing common currency on trade and employment in APEC. This paper analyzed first whether there is a reduction of exchange rate variability and proximity. The calculations confirm that the fluctuations have decreased. It was also interesting to note that the development of intra-trade has been producing similar economic conditions in member states. This movement seems to satisfy the OCA theory for APEC. Finally, this paper analyzed the motivation for abandoning domestic currencies and found that employment is strongly related to the abolition of each currency. Employment is one important point for the determining the success of introducing a common currency. The situation of the EU supports this notion. Considering employment in decisions regarding economic and monetary integration is key successful currency integration.

Notes

1. Some countries (areas) are excluded because of data unavailability.
2. Again, it is needless to say that the possibility is quite low. The model estimated in equation (1) is a typical gravity model. This type of model is widespread use now. See, for example, Frankel and Rose (1995).
3. The case of real exchange rate is also analyzed; however, the results are similar to the calculated using nominal effective exchange rate. McKinnon (1963) argued that in practice, real exchange rate behavior does not depend on the choice of monetary regime.
4. Of course whether all the other judge standards cannot be applicable. For example, labor and factor mobility is low in APEC, so one of the important standards is not applicable.
5. Some APEC countries alter their economic policies according to the trade partners' policies. The instrumental variable method is also considered; however, the results are similar. Time lag is also checked by AIC.

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