STOCK MARKET INTEGRATION AND TRADE REGIONALISM

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Abstract

Frankel and Wei (1998) proposed the hypothesis that open regionalism in capital markets is driven by trade regionalism. The validity of this hypothesis is examined for nine trading blocs in the regions of America, Asia and Europe. Indicators are constructed as measures for trade regionalism and stock market integration into the global network. Trading blocs in Asia, with the exception of AFTA, and trading blocs in Europe, display behavior consistent with the open regionalism hypothesis. Trade regionalism has a smaller role to play in the integration of the developed stock markets into the world system. On the other hand, trade regionalism has led to a lower degree of open regionalism in the stock markets of member countries in AFTA and ANCOM.

Keywords: ICAPM, intra-bloc trade, trading bloc

JEL classification: F02, F15, G12

1. INTRODUCTION

The last few years witnessed an accelerating increase in the number of trading blocs formally registered with WTO. Only 27 agreements were established before the 1990s, but the cumulative number of active trade agreements jumped to 88 by the end of the last millennium. The number continues to increase to a total of 186 by July 2005.[1] Bhagwati (1993) and Frankel et al. (1995) are of the opinion that the recent trade regionalism is more likely to be welfare reducing as it is

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[1] See the website of WTO at http://www.wto.org/. This new development could be results of the strengthening of the fundamental of world economy through highly liberalized multilateral trade system, changing political policy, free flow of capital, and reduction in the costs of trade (see Ethier, 2001).

expected to work against world economic globalisation. WTO, on the other hand, held the view that the development in regionalism is complementary to the multilateral trade system as long as free trade flow within the bloc is promoted, and barriers on trade outside the bloc are not raised (see GATT Article XXIV). According to MacMillan (1993), regionalism has allowed groups of countries to negotiate rules and commitments that go beyond what was possible multilaterally, and the negotiations may develop into items for the agenda of the WTO meetings.

Trade integration has the tendency to drive economic reforms among members of a trading bloc that accelerate the transition process to a market economy (Hoekman and Kostecki, 2001). Such reforms typically lead to monetary and fiscal policy coordination among member countries, and increasing intra-bloc capital flows. As a result of this liberalisation process, cross-market frictions in the financial sector are reduced. Extending the ideology of WTO that trade regionalism promotes globalisation to the real sectors, the integration process goes beyond the capital markets of a trading bloc. The reduction in capital market segmentation will occur not only within the bloc, but also with the rest of the world. In principle, when real sectors get more integrated, convergence in international finance is likely to take place in order to facilitate international trade. This is in line with the suggestion of Frankel and Wei (1998) that open regionalism in capital markets is likely to be driven by trade regionalism.

Using cluster analysis, the work of Heaney et al. (2000) and Heaney and Hooper (2001) recorded clear evidence of stock market segmentation from the world that co-exists with regional trading bloc and economic ties among the countries whose stock markets are segmented. The open regionalism hypothesis is refuted in their studies. Apart from their work, other studies take recognition of the role of capital market integration within trading blocs, but they do not directly examine the regionalism effect. Among others, these include Heaney and Hooper (1999) and Ng (2002) on the ASEAN Free Trade Area (AFTA); Akdogan (1992), Corhay et al. (1993), Johnson and Soenen (1993), Johnson et al. (1994), Monadjemi and Perry (1996), Choudhry (1996), Kanas (1998) and Fratzscher (2002) on the European Monetary Union (EMU); Soydemir (2000), Seabra (2001), Edwards and Susmel (2001), Chen et al. (2002), Heaney et al. (2002) and Johnson and Soenen (2003) on *Mercado Comun del Cono Sur* (MERCOSUR); and Adler (1995), Ewing et al. (1999), Adler and Qi (2003) on the North America Free Trade Area (NAFTA). Most of these

studies examine the various channels of stock market interaction, interrelationship, volatility spillover and issues of portfolio diversification among member countries of trading blocs as well as contagion effect of economic shocks such as the oil price shock and financial crisis. The results are insightful in showing market interdependence, but do not offer insights into the effect of trade regionalism on capital market integration.

This paper examines the impact of trade regionalism on integration of stock markets of countries of selected trading blocs. The main objective is to explore the link between trade regionalism and integration of stock market into the global network, in order to investigate if formation of trading blocs is consistent with the "open regionalism" perspective, or has it worked against globalisation of the capital market. A direct approach is adopted to construct indicators of trade regionalism and market integration. The intra-trade ratio is used as a proxy to trade regionalism, while the market integration indicator is developed within the framework of the international capital asset pricing model (ICAPM). The sample of this study consists of nine trading blocs, covering the geographical regions of America, Asia and Europe, thus providing a wider coverage than the studies of Heaney et al. (2000) and Heaney and Hooper (2001).

This paper is organized as follows. Section 2 outlines the framework of analysis and the data employed. Section 3 presents the results and discussion on the findings. Concluding comments are in the final section of the paper.

2. FRAMEWORK OF ANALYSIS

This section discusses the indicators used to measure the degree of trade regionalism and stock market integration for each trading bloc. The ratio of intra-bloc trade to world trade of a trading bloc is used to measure the level of trade regionalism. We refer to this measure as the Trade Regionalism Index (TRI). The TRI for trading bloc *T* is defined as:

$$TRI_{T,t} = \frac{1}{n_T - 1}\left(\frac{\sum_{i=1}^{n_T - 1}(X_{it} + M_{it})}{X_{Wt} + M_{Wt}}\right) \qquad (1)$$

where n_T is the number of countries in the trading bloc, X_{it} and M_{it} are the total bilateral import and export of country-*i*, respectively, with the other member countries of the same bloc in period *t*, and X_{Wt} and M_{Wt} are the total import and export of country-*i* with the world market, respectively. The degree of regionalism is said to be high when the intra-bloc trade constitutes a large part of the total trade of a trading bloc. This base measure for the extent of free flow of goods within a trading bloc serves to compare integration in a relative sense to trade openness to the world market.

We construct a stock market integration index using pricing errors estimated from a nested empirical asset pricing model following Korajczyk (1996) and Levine and Zervos (1998). According to the standard ICAPM, the pricing of cost of capital is determined in a linear return-generating process given by:

$$r_{it} = \alpha_i + \beta_i^W r_{World,t} + \varepsilon_{it} \qquad (2)$$

where r_{it} represents the excess market returns of the stock market in country-*i*, $i = 1, 2, \ldots, n_T$, and $r_{World,t}$ is the excess return of a world portfolio. The coefficient β_i^W is the world beta. The error term ε_{it} captures the idiosyncratic risk that is orthogonal to the global capital market. When the intercept α_i is zero, the world version of zero-beta CAPM of Black (1972) is obtained, and the world market is perfectly integrated.

Two extensions to the ICAPM specification are of interests. Perfect integration of the world market does not exist in both cases, and exposure to the world systematic risk is limited due to market segmentation. First is the model that incorporates exposure to the regional systematic risk that is suggested by Bekaert and Harvey (1997), Fratzscher (2002), Ng (2002) and Bekaert *et al*. (2005). This model is written as:

$$r_{it} = \alpha_i + \beta_i^W r_{World,t} + \beta_i^R r_{Regional,t} + \varepsilon_{it} \qquad (3)$$

where $r_{Regional,t}$ is the regional excess return, constructed either from a regional portfolio or an index of a market within the region that is perceived to have major influence on the other markets, and β_i^R is the regional beta. The second alternative incorporates the trading bloc effects on asset pricing, and was considered by Akdogan (1992), Heaney and Hooper (1999), and Adler

and Qi (2003) in their studies. The model explains how market integration is affected, or can be explained by asset returns of the trading bloc members. This model can be written as:

$$r_{it} = \alpha_i + \beta_i^W r_{World,t} + \beta_i^{TB} r_{TradingBloc,t} + \varepsilon_{it} \quad (4)$$

where $r_{TradingBloc,t}$ is the trading bloc excess return, constructed from an equal or unequal weighted portfolio of the trading bloc members, and β_i^{TB} is the trading bloc beta.

We propose a nested model of equations (2), (3) and (4) that result in an asset pricing model stated as:

$$r_{it} = \alpha_i + \beta_i^W r_{World,t} + \beta_i^R r_{Regional,t} + \beta_i^{TB} r_{TradingBloc,t} + \varepsilon_{it} \quad (5)$$

In the estimation, multicolinearity among the explanatory variables is overcome by using the orthogonalised regional and trading bloc excess returns according to the procedure suggested by Cochrane (2005, Chapter 1). The regional excess return that is orthogonal to the world excess return, $r^O_{Regional,t}$, is generated as:

$$r_{Regional,t} = Proj(r_{Regional,t} \mid r_{World,t}) + r^O_{Regional,t} \quad (6)$$

where $$Proj(r_{Regional,t} \mid r_{World,t}) = \frac{cov(r_{World,t}, r_{Regional,t})}{var(r_{World,t})} r_{World,t} \quad (7)$$

The trading bloc excess return that is orthogonal to the world and regional excess returns, $r^O_{TradingBloc,t}$, is generated as:

$$r_{TradingBloc,t} = Proj(r_{TradingBloc,t} \mid r^O_{Regional,t}) + r^O_{TradingBloc,t} \quad (8)$$

where $$Proj(r_{TradingBloc,t} \mid r^O_{Regional,t}) = \frac{cov(r^O_{Regional,t}, r_{TradingBloc,t})}{var(r^O_{Regional,t})} r^O_{Regional,t} \quad (9)$$

The excess returns for the region and trading bloc in equation (5) are replaced with the orthogonalised excess returns as below:

$$r_{it} = \alpha_i + \beta_i^W r_{World,t} + \beta_i^R r^O_{Regional,t} + \beta_i^{TB} r^O_{Trading\ Bloc,t} + \varepsilon_{it} \quad (10)$$

According to Korajczyk (1996), the deviation from ICAPM or the pricing error as represented by α_i, increases with higher official barriers and taxes to international asset trading, larger transaction costs, and larger impediments to the flow of firm information. Adjustment is made to the pricing errors suggested by Korajczyk (1996) and Levine and Zervos (1998) to establish the stock market integration index (SMII) defined as follows:

$$SMII_T = -\left|\sum_{i=1}^{n_k} \alpha_i\right| \quad (11)$$

for trading bloc *T*. The index is positively correlated with the degree of market integration. Perfect integration with the world market occurs when SMII is equal to zero. To generate a stochastic time series $SMII_{T,t}$, we use a rolling regression approach and the rolling window is set at 60 observations (5 years).

After computing $SMII_{T,t}$ and $TRI_{T,t}$ for each trading bloc, we estimate the following regression:

$$SMII_{T,t} = a + bTRI_{T,t-j} + \varepsilon_{T,t} \quad (12)$$

where *j* is set at 1, 6 and 12. The lag model is used to examine the lagged effect of trade regionalism on stock market segmentation, and the extent to which the regionalism effect is persistent. We expect the slope coefficient *b* to be significantly positive if trade regionalism reduces market segmentation of a trading bloc from the world market. The Newey-West (1987) heteroskedasticity and autocorrelation consistent covariance estimates are used in the computation of test statistics for evaluating the significance of the coefficients.

3. SAMPLE OF STUDY

Nine trading blocs are included in this study, three from each of the geographical regions of Europe, America and Asia. The trading blocs are as follows:

(i) The Region of Europe

European Union (EU)

European Free Trade Area (EFTA)

Central European Free Trade Area (CEFTA)

(ii) The Region of America

North American Free Trade Area (NAFTA)

Mercado Común del Sur (MERCOSUR)

Andean Common Market (ANCOM)

(iii) The Region of Asia

Australia-New Zealand Closer Economic Relations (CER)

ASEAN Free Trade Area (AFTA)

South Asian Preferential Trade Agreement (SAPTA).

The level of economic integration of these trading blocs is different. Table 1 provides a summary of relevant information of the trading blocs and their member countries. EU is a monetary union; MERCOSUR and ANCOM are aiming to become a common market; EFTA, CEFTA, NAFTA and CER are free trade areas; while AFTA and SAPTA are established on the basis of a preferential trade agreement. Nevertheless, the free trade commitment in some of these trading blocs is far more in depth than suggested by their set up. For example, members of EFTA and NAFTA have services agreement under GATS Art. V, and this represents a higher degree of integration than suggested by that of a conventional free trade area.

For the nine trading blocs that consist of a total of 37 countries, we collected monthly data for the period January 1988 to October 2005. Trade data are extracted from the IMF Direction of Trade Statistics. Stock returns are computed from the country stock market indices sourced from Morgan Stanley Capital International (MSCI). The MSCI All Country World Index is used as proxy to the world portfolio. For the regional portfolios, we collected MSCI regional indices, namely, All Country Europe index, All Country America index and All Country Asia index. For the trading bloc portfolio, we construct an equal weighted portfolio for every member countries using returns on the stock market indices of their counterparts. The US Treasury bill rates downloaded from the website of the Federal Reserve Bank are used to represent the risk free rates in the computation of excess returns.

TABLE 1 Summary Information of Trading Blocs

Trading Bloc	Date of entry into force	GATT/WTO notification		
		Date	Related provisions	Type of agreement
Europe				
EU	1-Jan-58	10-Nov-95	GATS Art. V	Services agreement
(Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Netherlands, Portugal, Spain, Sweden and UK)	1-Jan-58	24-Apr-57	GATT Art. XXIV	Customs union
EFTA	1-Jun-02	3-Dec-02	GATS Art. V	Services agreement
(Norway and Switzerland)	3-May-60	14-Nov-59	GATT Art. XXIV	Free trade agreement
CEFTA	1-Mar-93	30-Jun-94	GATT Art. XXIV	Free trade agreement
(Czech, Hungary and Poland)				
America				
NAFTA	1-Apr-94	1-Mar-95	GATS Art. V	Services agreement
(Canada, Mexico, and the US)	1-Jan-94	1-Feb-93	GATT Art. XXIV	Free trade agreement
MERCOSUR	29-Nov-91	5-Mar-92	Enabling Clause	Customs union
(Argentina and Brazil)				
ANCOM*	16-Oct-69	nil	nil	nil
(Colombia, Peru and Venezuela)				
Asia				
CER	1-Jan-89	22-Nov-95	GATS Art. V	Services agreement
(Australia and New Zealand)	1-Jan-83	14-Apr-83	GATT Art. XXIV	Free trade agreement
AFTA	28-Jan-92	30-Oct-92	Enabling Clause	Preferential arrangement
(Indonesia, Malaysia, Philippines, Singapore and Thailand)				
SAPTA	7-Dec-95	22-Sep-93	Enabling Clause	Preferential arrangement
(India, Pakistan, and Sri Lanka)				

*ANCOM is not in WTO's notification list.
Source: http://www.wto.org/.

4. RESULTS

The descriptive statistics on TRI and SMII are reported in Table 2. The mean of TRI provides an indication of the intra-bloc integration of the trade sector. The highest mean value is obtained for EU (71.73%), and this is followed by NAFTA (62%) and MERCOSUR (20.05%). EFTA has the

smallest intra-trade ratio (0.52%), followed by SAPTA (4.12%) and CEFTA (5.58%). The values suggest that the intra-trade ratio is directly related to the total economy size of the trading bloc. The SMII average shows the degree of integration of the stock markets into the global market. After controlling for the world, regional and trading bloc factors, the level of integration is highest in the order of EFTA, CER and EU, while the lowest level of integration is found among the stock markets of MERCOSUR and SAPTA. Unlike the trade sector, clearly the integration of stock market is not related with its total size. The more matured markets seem to be characterised by a higher degree of integration into the global network.

TABLE 2 Descriptive Statistics

	TRI				SMII			
Trading Bloc	Mean	Standard deviation	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum
Europe								
EU	0.7173	0.0241	0.6687	0.7776	-0.0103	0.0029	-0.0059	-0.0147
EFTA	0.0052	0.0009	0.0035	0.0077	-0.0065	0.0023	-0.0011	-0.0119
CEFTA	0.0558	0.0063	0.0458	0.0712	-0.0192	0.0055	-0.0085	-0.0307
America								
NAFTA	0.6200	0.0190	0.5655	0.6516	-0.0128	0.0044	-0.0050	-0.0236
MERCOSUR	0.2005	0.0258	0.1051	0.2660	-0.0250	0.0066	-0.0145	-0.0438
ANCOM	0.0741	0.0098	0.0519	0.0925	-0.0180	0.0082	-0.0009	-0.0309
Asia								
CER	0.1347	0.0117	0.1090	0.1883	-0.0092	0.0069	-0.0002	-0.0375
AFTA	0.1886	0.0143	0.1548	0.2184	-0.0151	0.0073	-0.0034	-0.0324
SAPTA	0.0412	0.0116	0.0158	0.0670	-0.0211	0.0123	-0.0022	-0.0427

The estimated results for equation (12) are shown in Tables 3, 4 and 5 for j = 1, 6 and 12, respectively. The results are mixed. Slightly more than half of the trading blocs considered show that the TRI has a significant positive effect on SMII. The positive effect of trade regionalism on market integration is consistently found for all the trading blocs in the European region, and all except AFTA in the region of Asia. The evidence here provides support to the open regionalism hypothesis suggested by Frankel and Wei (1998). The slope coefficient for these trading blocs is significant in at least one of the models considered. The same significance, however, is not found

for CER. Interestingly, the magnitude of the slope coefficient for the larger trading blocs, in particular EU, is relatively small. This suggests that trade regionalism has a smaller role to play in integrating the markets of the larger trading blocs into the world market. This role is more important for the smaller trading blocs. It may be worth noting that the magnitude of these positive slope coefficients decreases as the lag order used in the model increases. It seems that the largest impact of intra-bloc trade effect on stock market integration comes almost instantaneously, and the impact reduces with the progress of time.

The trade regionalism effect for the trading blocs in the region of America and AFTA is negative. The results show that intra-bloc trade has caused a lower degree of integration into the world market. One implication is that trade regionalism has led to stock market regionalism. This is particularly obvious for ANCOM and AFTA where the negative slope coefficients are highly significant. Trade regionalism does not seem to have worked in favour of integrating the stock markets in these trading blocs into the world market.

TABLE 3 Regression Results for equation $SMII_{T,t} = a + bTRI_{T,t-1} + \varepsilon_{T,t}$

Trading Bloc	Intercept		Slope		R^2	LogL	AIC	SC
Europe								
EU	-0.0411	(0.0113)***	0.0429	(0.0156)***	0.1314	676.8984	-8.9986	-8.9585
EFTA	-0.0163	(0.0012)***	1.9245	(0.2435)***	0.5124	457.2190	-10.0048	-9.9496
CEFTA	-0.0384	(0.0104)***	0.3446	(0.1828)*	0.1497	258.8406	-7.6669	-7.6011
America								
NAFTA	-0.0127	(0.0240)	-0.0003	(0.0387)	0.0000	603.4633	-8.0195	-7.9794
MERCOSUR	-0.0164	(0.0056)***	-0.0436	(0.0284)	0.0308	547.4907	-7.2732	-7.2331
ANCOM	0.0240	(0.0070)***	-0.5680	(0.0863)***	0.4470	333.9345	-7.2953	-7.2401
Asia								
CER	-0.0218	(0.0095)**	0.0952	(0.0645)	0.0280	541.9565	-7.1994	-7.1593
AFTA	0.0241	(0.0124)*	-0.2089	(0.0673)***	0.1661	538.8695	-7.1583	-7.1181
SAPTA	-0.0593	(0.0040)***	0.9154	(0.0833)***	0.7306	330.6202	-7.2224	-7.1672

The figures in parentheses are Newey-West (1987) heteroscedasticity and autocorrelation consistent standard errors with truncation lag of 3. ***, **, * denote significance at 1%, 5% and 10%, respectively.

TABLE 4 Regression Results for equation $SMII_{T,t} = a + bTRI_{T,t-6} + \varepsilon_{T,t}$

Trading Bloc	Intercept		Slope		R^2	LogL	AIC	SC
Europe								
EU	-0.0339	(0.0117)***	0.0329	(0.0163)**	0.0756	666.4701	-8.9191	-8.8787
EFTA	-0.0159	(0.0008)***	1.8239	(0.1795)***	0.4355	470.4319	-9.8617	-9.8080
CEFTA	-0.0262	(0.0104)**	0.1264	(0.1821)	0.0187	269.3640	-7.5314	-7.4676
America								
NAFTA	0.0101	(0.0225)	-0.0365	(0.0363)	0.0267	605.7664	-8.1042	-8.0639
MERCOSUR	-0.0153	(0.0046)***	-0.0457	(0.0236)*	0.0376	552.0313	-7.3830	-7.3427
ANCOM	0.0326	(0.0053)***	-0.6757	(0.0678)***	0.6664	374.1732	-7.8352	-7.7815
Asia								
CER	-0.0136	(0.0078)*	0.0396	(0.0539)	0.0084	577.5843	-7.7260	-7.6856
AFTA	0.0188	(0.0112)*	-0.1803	(0.0609)***	0.1182	529.1980	-7.0765	-7.0362
SAPTA	-0.0552	(0.0047)***	0.8453	(0.1021)***	0.6234	329.5456	-6.8957	-6.8419

The figures in parentheses are Newey-West (1987) heteroscedasticity and autocorrelation consistent standard errors with truncation lag of 3. ***, **, * denote significance at 1%, 5% and 10%, respectively.

TABLE 5 Regression Results for equation $SMII_{T,t} = a + bTRI_{T,t-12} + \varepsilon_{T,t}$

Trading Bloc	Intercept		Slope		R^2	LogL	AIC	SC
Europe								
EU	-0.0256	(0.0121)**	0.0211	(0.0167)	0.0326	638.6732	-8.9045	-8.8631
EFTA	-0.0149	(0.0016)***	1.5996	(0.3342)***	0.3120	461.0357	-9.6639	-9.6101
CEFTA	-0.0322	(0.0152)**	0.2401	(0.2810)	0.0527	270.6145	-7.5666	-7.5029
America								
NAFTA	0.0277	(0.0236)	-0.0644	(0.0380)*	0.0777	586.4374	-8.1740	-8.1325
MERCOSUR	-0.0132	(0.0048)***	-0.0542	(0.0251)**	0.0526	538.0139	-7.4967	-7.4553
ANCOM	0.0306	(0.0047)***	-0.6431	(0.0625)***	0.6472	371.5134	-7.7792	-7.7255
Asia								
CER	-0.0091	(0.0056)	0.0119	(0.0410)	0.0015	603.9009	-8.4182	-8.3768
AFTA	0.0187	(0.0107)*	-0.1813	(0.0580)***	0.1070	504.5445	-7.0286	-6.9872
SAPTA	-0.0539	(0.0056)***	0.8531	(0.1282)***	0.5002	316.0937	-6.6125	-6.5587

The figures in parentheses are Newey-West (1987) heteroscedasticity and autocorrelation consistent standard errors with truncation lag of 3. ***, **, * denote significance at 1%, 5% and 10%, respectively.

4. CONCLUSION

This paper investigates the impact of trade regionalism on stock market globalisation using intra-trade ratio and pricing errors from a nested ICAPM model for nine trading blocs in the regions of Europe, America and Asia. Mixed results are found. The impact is positive for the trading blocs in the regions of Europe and Asia, with the exception of AFTA. The open regionalism hypothesis holds true for these trading blocs. The impact of intra-trade ratio on integration into the world market, however, is smaller for trading blocs that are larger. The impact on the EU stock markets, for example, is smaller compared to that on the markets of EFTA, CEFTA and SAPTA.

Trade regionalism was found to have an adverse effect on integrating the stock markets in the trading blocs in the region of America, in particular, ANCOM, and AFTA in the region of Asia, into the world market. The implication for these cases is that intra-bloc trade has resulted in regionalism but not globalisation of their stock markets.

There are a few caveats to this study. The study is based on the assumption that the nested ICAPM is the correct pricing model for explaining stock market dynamics. Another shortcoming is that the intra-trade ratio captures only movements in goods but not services and factors of production such as capital and labour. Future research should venture into a different variety of asset pricing models and also alternative measures of market integration. Similarly, other indicators of trade regionalism need to be explored.

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