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Measuring and Explaining Levels of Regional Economic Integration

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Abstract:
124 Regional Trade Agreements were notified to the GATT during the period 1948-1994. Since 1995, over 130 agreements have been notified to the WTO. Using empirical evidence, this paper proposes a way of measuring levels of regional integration and examines several potential explanations for the existence of different levels of regional economic integration. Using a database of regional integration where levels of integration are ranked across countries, a probit analysis in a discrete choice framework is applied. Common traits influencing regional integration decision-making were examined to determine those most influential. It is concluded that democracy and economic freedom, are significant contributors to the chosen level of regional integration. The role of political and economic uncertainty is examined and it is found that trade uncertainty is also a significant contributing factor.

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1. Introduction

The fall of the Berlin Wall precipitated a shift in the motivation of those countries considering the possibility of integrating regionally as alliances shifted dramatically from the Cold War based bi-polar regime to a new multi-polar regime. In the last several years, more regional integration arrangements (RIA) have been notified to the WTO than in the entire history of the GATT. As seen in ***Figure 1,*** there have been 130 notifications since 1995 versus 124 during the period 1948-1994. Schiff (2000) has examined the proliferation of Free Trade Agreements (FTA) and Customs Unions (CU) and found that the ratio of FTAs to CUs has increased in the 1990's, particularly in the case of North-South agreements.[2] Furthermore, the characteristics of RIA's have also shifted. Ferdandez and Portes (1998) note that Regional Trade Agreements (RTA) have not only increased in number but have also deepened and widened.

A search for an explanation of the proliferation of RIAs has led to the conclusion that more than the traditional gains from trade are provided by the establishment of these types of organizations. Whalley (1998) depicted RTAs as insurance arrangements. Perroni and Whalley (2000) argued that regional trade agreements (RTA) are sought by small countries as protection against a global trade war. Wu (2002) has shown a potential explanation to be that the formation of regional integration agreements may aid in reducing risks and uncertainty associated with foreign transactions, thereby leading to expanded trade and investment. As the world shifted away from the Cold War alliance regime, the resulting uncertainty encouraged the formation of regional integration agreements.

Much empirical work has been done in the context of customs unions and FTAs. This work is generally divisible into two groups: computable general equilibrium models of trade and

[2] "North" is considered industrially developed while "South" is considered to be less developed.

trade policy; and econometric analysis of the impact of trade flows. In most cases, FTA formation is taken to be exogenous. In contrast to this literature, Bergstrand and Baier (2003) systematically look at the economic factors that influence the likelihood of pairs forming an FTA. Looking solely at these economic characteristics, the empirical model they develop is able to correctly predict 85% of the number of existing FTAs in the year 1996. Mansfield, Milner, and Rosendorff (2002) empirically find that pairs of democratic countries are roughly four times as likely to form a preferential trade agreement. The empirical literature, however, has not generalized to all forms of regional integration, nor have non-economic and economic characteristics been systematically examined together. Recognizing the fact that one explanation may not apply to recent RIA proliferation, it is essential to examine the conditions under which such arrangements come into existence.

This paper commences a discussion of whether there are certain characteristics, economic and/or political, that contribute to the probability of a country joining a particular regional integration arrangement. A correct hypothesis depends on the ability to isolate relevant characteristics of member states. Are there common traits among RIAs? If so, what characteristics influence the respective level of RIA participation? Economic and institutional development characteristics are examined with particular attention.

This paper thus has two objectives. The first is to isolate those common traits of RIAs and define contributing characteristics. Second, is to test explicitly whether economic and/or political uncertainty is a positive contributor to the chosen level of trade integration. Four general measures of uncertainty are used in this paper: trade uncertainty, political uncertainty, business cycle uncertainty, and price uncertainty. The various measures used are described in detail in Section 3.

In addition, this paper provides a more complete empirical test using the different levels of RIA participation. Data on regional integration has not been previously gathered in a systematic manner. A database of regional integration was developed which ranks the levels of integration across countries.[3] Using this database, a probit model is developed and tested where the level of regional integration is the dependent variable.

The findings of this paper are that democracy, geographic characteristics, membership in multilateral organizations, per capita income, economic freedom, and trade openness, are significant contributors to the chosen level of regional integration. Per capita income is a good indicator of whether a country increases its level of integration, as defined in ***Figure 2***. Furthermore, global trade regime uncertainty *does* positively contribute to the level of regional integration.

The rest of the paper is organized as follows: Section 2 introduces the regional integration data set, describes the other data and the main hypothesis. Section 3 explores the probit model. Section 4 summarizes the estimation results and Section 5 concludes.

2 Data and Hypothesis

2.1 A Dataset of Regional Integration Levels

The data set of regional integration specifies a natural ordering of regional integration levels. These ranks are sequential – economic union is not established without first passing through a customs union.[4] In addition, the step between a free trade area and a customs union is not comparable to the step between a customs union and an economic union. These different levels are presented in ***Figure 2***.

[3] Wu (2001).
[4] Recent work, e.g., Bird and Rajan (2002), confirms the ordering of the choice of levels of economic integration.

I construct an ordered index using the categories described in ***Figure 2***. These rankings are described below. A *regional integration agreement* (RIA) covers all of these different arrangements including those involving countries where members are not all from the same geographic region.

- ***Sectoral trading agreements*** are very limited. They may be thought of as reflecting trade cooperation rather than actual integration. Sectoral cooperation limits the agreement to well-defined sectors such as grain or steel. Sectoral trading is coded as level one integration.
- ***Preferential trade agreements or areas*** (PTA) require participants to eliminate or lower tariffs on each other's imports. Participants are allowed to retain the ability to determine the existence and the level of restrictions to be imposed on non-members. Typically, a *free trade area* (FTA) involves zero tariffs between member states, although usually only extended to selected goods and services. Both PTAs and FTAs are coded as the second level of regional integration although PTAs are not admissible under WTO rules. PTAs are considered shelters for inefficient industries in the member countries and are viewed as harming nonmember countries due to the economic loss incurred when parties to the agreement divert trade to themselves and exclude outsiders.
- ***Customs unions*** (CU) are similar to FTAs except that participating countries agree to adopt uniform import tariffs and common restrictions to outside countries in the form of a common external tariff (CET). The creation of the CET aids in the negation of trade deflection and rules of origin issues. The establishment of the CET implies some form of common decision-making and the development of common institutions to aid in the regulation of common trade interests and the redistribution of the CET revenue. The CET

is the defining factor of a customs union which is coded level three of regional integration.

- ***Common markets*** (CM) require a much greater degree of political and economic cooperation than the three previously discussed arrangements. The free movement of the factors of production characterizes a common market. In order to ensure competition on a level playing field, these agreements are often complemented with the harmonization of policies in health and safety, social security, and education. Free movement of factors is thus the key attribute of this type of RIA which is coded as level four.
- An ***Economic union*** (EU) reflects a higher and increasingly complex level of regional cooperation. The addition of monetary and fiscal harmonization requires the formation of supranational institutions and organizations that typically have binding decision-making power over the members. An EU also presupposes common taxation and other common procedures. While there is increased political unification in an EU, the individual sovereign states maintain their separate identities. Only the European Union countries participating in the European Monetary Union have attained this level, level five.
- A ***Supra-national union*** covers both the political and the economic realms. Member states abandon goals of preserving national sovereignty. An example of this type of unification is the United States or the unification of East and West Germany, i.e., a federation. The Supra-national union is not included in the current data set.

Each country was coded with only the highest level of RIA in which it participates. For example, Botswana, a member of the fledgling Southern African Development Community, is also a member of the South African Customs Union and thus is coded with a 3 for the latter customs union membership – the highest level of RIA in which it participates. The data set therefore

captures the deepest form of regional integration to which a country belongs.[5] Monetary union in this framework, unfortunately, is unable to be distinguished from common market integration. This poses a problem when coding the CFA zones in West and Central Africa. Thus, the highest level of **trade** integration is taken and monetary union will not override the existence of the FTA in the case of West and Central Africa.

150 countries were included in the dataset. Inclusion was based on available data. ***Figure 3*** shows the evolution of the levels of regional integration in the sample. The former Soviet Union and Russia are not included. Various political issues make the coding of the U.S.S.R. difficult.[6] The majority of the ten European Union Accession Countries are included from 1989 forward. If a country's membership in a particular type of regional integration agreement could not be verified to have attained significance using the criteria outlined above, its membership in the RIA was not included.

2.2 Factors Influencing RIA Formation

2.2.1 Measures of Uncertainty

One objective of this paper is to investigate how greater political and economic uncertainty has provided an incentive for countries to increase their participation in regional integration arrangements. The change in the global structure of trading alliances, brought on by the end of the Cold War, lead countries to seek multilateral agreements in an attempt to alleviate augmented risks. Furthermore, the supra-national institution governing dispute settlement, the

[5] This is unfortunate since only one part (the deepening effect) of RIA formation is able to be studied. Future studies may wish to take into account the multi-RIA participation aspect.
[6] Other data for the former Soviet Union are also unavailable.

WTO, emerged in 1995. Four measures of uncertainty are examined in this paper: trade uncertainty, political uncertainty, business cycle uncertainty, and price uncertainty.

Trade uncertainty can be measured through a country's openness in terms of exports and imports as a ratio of gross domestic product (GDP). Rodrik (1987) has argued that the more open a country is to international trade, the more uncertainty is created for participants in the economy.[7] Openness to international trade is associated with uncertainty because a country with a higher proportion of international trade dependence is more likely to have its terms of trade adversely affected by the international community. Since countries may choose trade integration as a method to mitigate risks associated with trade, we expect there to be a positive relationship between trade openness and RIA formation.

There are several measures of trade openness. The traditional measure of trade openness, from the Penn World Tables 6, is the ratio of imports and exports to GDP.[8] A second measure, taken from the World Bank, uses tariffs measured by import duties as a percentage of total imports. A third measure, the Trade & Openness Index (TOI), published by Economic Freedom of the World (EFW), is designed to measure the degree to which countries' policies interfere with international exchange. In contrast to the more traditional measures, there are four basic components to this index: tariff rates; the black-market exchange premium; restrictions on capital movement; and the actual size of the trade sector as compared to the expected size. This index was derived for 109 countries in 1998 and slightly fewer in previous years. It is only available for

[7] Rodrik posits that to combat the uncertainty generated by a more open economy, social spending should increase.
[8] This measure has several theoretical difficulties, but here the problems help generate the sought after measure. One problem with using the imports and exports ratio is that it mitigates the importance of services in the economy since trade is usually high in merchandise. A way around this would be to weight the openness ratio by services, however, here, we hypothesize that high service sectors are an additional measure of development and thus, low openness ratios may also indicate that an economy is not as susceptible to uncertainty due to shifts in the international trade regime. This is true for the United States, which has a low openness ratio and a low probability of being affected by international trade instability.

the later part of the 1990's. In 1998, the highest-ranking countries were Hong Kong, Singapore, Estonia, Belgium, Ireland, Netherlands, Germany and Luxembourg. As with the traditional measure of openness, a positive relationship between this index and levels of regional integration is expected.

Political uncertainty may be measured in a number of ways. Two potential measures, one of corruption and another of economic freedom, are presented. The first measure is the level of corruption in a country. High levels of corruption make it more likely that countries try to use regional integration agreements to end trade risks brought about by the capricious behavior of domestic government representatives. The corruption index published by Transparency International is a constructed ranking where the purpose is to assess the corruption level of 52 countries as perceived by businesspeople, risk analysts, and the general public. The perceptions of this group may not always be a fair reflection of the actual state of affairs and does not necessarily reflect the concrete level of corruption in the surveyed countries and thus, due to its subjectivity, trends are difficult to determine. High levels of corruption, and therefore greater political uncertainty, should provide a positive incentive for regional integration.

The second potential measure of political uncertainty is the index of economic freedom. This index provides a higher rating for those countries with institutions and policies consistent with price stability, the rule of law and secure property rights, smaller governments, and free trade. Freer trade is defined as lower tariffs and fewer non-tariff barriers consistent with regional integration. The EFW index relies on quantitative variables to develop its rating gradations for each component.[9] Institutional improvement has been shown to be a prerequisite for growth and

[9] In contrast, the Heritage Index relies on qualitative evaluations used to assign component ratings to each country. While the Heritage Index rates slightly more countries, the EFW index provides a more objective figure and is therefore the preferred measure in this paper.

development and thus more secure trade. Institutional development is expected to be positively related to regional integration as countries secure property rights and continue to deepen their levels of regional integration.

Several other ways of measuring political stability presented themselves. None were significant. One way is using the mean number of revolutions. Another measure of stability is based upon the integrity of central bank policies. While both were initially included in the ordered probit analysis, neither was a significant indicator of the level of regional integration and therefore are not reported in the results section.[10]

Business cycle uncertainty is another type of uncertainty contributing to greater levels of regional integration. There is risk associated with the general health of the economy for individual producers as they are subject to the vicissitude of their domestic environment. A more open economy may expose a country to the vagary of other countries business cycles; however by joining a RIA, the country may also afford itself of the opportunity to take advantage of the "portfolio effect" of all these business cycles and thus reap the benefits of more stable production and income. Indeed, Mattli (1999) finds that downturns in business cycles spur the formation of cooperative agreements. Furthermore, there is growing evidence that volatility is positively correlated with the rate of growth (this includes most Western European countries). Business cycle uncertainty is generally measured using GDP growth, calculated from t to $t+1$, as a rough measure of year-to-year uncertainty. GDP comes from the Penn World Tables 6 data. We expect a negative relationship between positive GDP growth and the level of RIA.

[10] Revolutions and coups and central bank dependence have also been shown in the macroeconomic literature to be strongly associated with average inflation rates.

Price uncertainty is proxied with inflation rates. It has been shown that average inflation rates are lower in more open economies.[11] Inflation rates are often used as measure of domestic instability, soundness of economic policies, and as a reflection of the importance of international markets. Global financial markets interact on a daily basis. It serves to discipline those countries in the developing world with extremely high inflation rates and thus discourages the adoption of domestic policies which promote price uncertainty. Inflation is measured as changes in the personal consumption price levels of each country. All data come from the Penn World Tables 6 and are on an annual basis and are PPP measures adjusted for the exchange rate.

Thus far we have examined the various measures of uncertainty. In order to proceed further, we still need to present other data to be used as the control variables.

2.2.2 Other Data

Democracy

It is the practice of the European Union to forbid membership until the applying country has fulfilled three conditions: It must be a functioning market economy, have a democratic political system, and accept the *acquis communautaire*. A country is thus required to obtain a certain level of institutional and economic development before it is accepted as a European Union member. The importance of institutional development was discussed in the section on political uncertainty. Whether a country is a democracy is a measurable characteristic. As previously cited, there is evidence in the political economy literature that democracies are more

[11] E.g., Romer (1993).

inclined to join a RTA.[12] Democracy is measured on a 0-10 scale and is the institutionalized democracy score given in the Polity IV dataset.

A second measure for institutional development, highly correlated with democracy, is the measure for polity, also from the Polity IV dataset. Polity is measured on a -10 to +10 scale where -10 is autocracy and +10 is democracy. The correlation between polity and democracy is almost 1 to 1.

Country Characteristics and Income

To control for country specific characteristics, several geographic indicators are used: population, land area, a dummy variable for whether a country is landlocked, and a dummy variable for whether a country is an island nation. A measure for remoteness is also used. Remoteness is defined as the inverse of the log(distance to nearest trading partner/GDP).[13] As a further defining characteristic, I create dummy variables for a country's participation in the OECD and the IMF. GATT/WTO participation is not included because the relationship with RIA formation is almost 1 to 1. Membership in other multilateral organizations is a suitable instrument for multilateral participation. If participation in the multilateral system is important, as hypothesized, we would expect positive relationships between membership in such establishments and participation in a RIA.

Per capita GDP is also included as a control variable since per capita income is a good economic indicator of a country's development level and potential partner countries may choose

[12] See Rosendorff (2002), Mansfield et al. (2002).

[13] Data on remoteness, total land area, and total population, as well as some of the other political uncertainty measures, were graciously provided by Andrew Rose and are located on his website at http://faculty.haas.berkeley.edu/arose/RecRes.htm. Rose, interestingly, found very little significant relationship between WTO membership, trade liberalization, and RTA membership.

not to invite less developed countries to join an existing RIA. Finally, although per capita income should theoretically have a positive relationship with the levels of regional integration, there is also the possibility of *reverse causality*. When countries liberalize their trade, often as a result of joining an RIA, levels of trade increase and as a result the per capita income of a country also improves. Certain levels of per capita income as well as the development of stable institutions may be required of countries seeking to join already existing RIAs. The result is that countries interested in joining RIAs or deepening their commitments will follow policies designed to enhance these aspects and causation is the reverse of the hypothesis. A way to remove the reverse causality problem is to use instrumental variable estimation techniques. Unfortunately, the ordered probit model is far from ideal for instrumental variable estimation. As estimation techniques improve, future assessment of this difficulty may be possible.[14] GDP per capita is calculated from data provided by the Penn World Tables. The reported results use terms of trade adjusted per capita GDP. I now turn to a description of the model.

3 Model Specification

3.1 The Basic Model

As noted, nearly every country in the world is a member of, or in the process of discussing membership in, one or more regional integration arrangements.[15] From ***Figures 1 and 3***, it is apparent that increasing numbers of countries have made a multinomial choice. Thus, in

[14] The endogeneity issue has been partially addressed by Baier and Bergstrand (2003).
[15] http://www.wto.org. Agreements concluded among developing countries account for 15% of the total number of notified agreements to the WTO.

any one year, a country chooses between sectoral cooperation, a free trade agreement, a customs union, or a common market.[16]

When the outcomes are clearly ordered, we should take into account that the dependent variable is both discrete and ordinal (as in this case). We cannot use linear regression to identify the causal relationship between RIA levels and explanatory characteristics since it would treat the difference between sectoral cooperation and PTA as identical to the difference between a customs union and a common market. This is obviously not the case. Under this setting, the most commonly used and most appropriate estimation technique is either an ordered probit or an ordered logit model. Here, I choose to estimate an ordered probit model.[17]

Regarding the level of regional integration, a country follows a specific set of steps to institutionally develop the framework necessary to support first a free trade agreement, and then a customs union.[18] In addition, the data leads us to infer that the dependent, ranked, levels of regional integration reflect an underlying qualitative variable, i.e., the chosen level of cooperation. Therefore an ordered probit estimation is more suitable than that of ordered logit.

Given the characteristics of a country: income, measures of uncertainty, its institutions and geography, we endeavor to estimate the probabilities that this country chooses a given level of regional integration. A three-way choice of regional integration, i.e., sectoral cooperation,

[16] Since the data are only through 1998, economic union is not a choice as it did not become effective for the European Union until 1999.

[17] The difference between the ordered logit and ordered probit models lies in the assumed distribution of error terms. In practice, there is no significance difference between the two results. I estimate the ordered probit model because with the current data, the implications of the exercise are more readily explained.

[18] Exceptions are the Central and West African Monetary Unions, two groups of former French colonies who have had their currencies tied to the French Franc (CFA) since independence. Although, the WAMU has been characterized by some trade integration, it lacks a common external tariff and its trade liberalization program is ad hoc with each member determining its own degree of protection. Sectoral cooperation was thus determined to be the overall level of regional trade integration.

FTA, or customs union, is modeled by an ordered probit model where the latent, or unobserved, continuous variable, Y_i^* is a linear combination of the form:

$$Y_i^* = b'x_i + e_i$$

where **â** is a vector or unknown parameters to be estimated, $\boldsymbol{x_i}$ is a vector of explanatory variables for country *i*, e.g., the demographic and economic characteristics described in the previous sections, and $_i$ are independent normal disturbances with mean zero and unit variance. To estimate this model, we use maximum likelihood estimation.

The observed discrete dependent variable, $\boldsymbol{Y_i}$, takes on its lowest value (sectoral cooperation) if $Y_i^* \le 0$, its medium value (FTA) if $0 < Y_i^* \le t$, and its highest value (customs union) if $t < Y_i^*$. Under the restriction that **0 < ô**, this specification implies that:

$$\begin{aligned} &\text{Prob}(Y_i = \text{SectoralCooperation}) = \Phi(-b'x_i) \\ (2) \qquad &\text{Prob}(Y_i = \text{FTA}) = \Phi(t - b'x_i) - \Phi(-b'x_i) \\ &\text{Prob}(Y_i = \text{Customs Union}) = 1 - \Phi(t - b'x_i) \end{aligned}$$

where ô is the threshold value to be estimated and Ö is the standard normal cumulative distribution function.[19] Standard practice is to set the first threshold value to 0. Equation (2) above is interpreted as the probability of observing an FTA is equal to the probability that the estimated linear function, plus a random error, is within the range of the estimated threshold between **0** and **ô**. The constant in an ordered probit is set to zero.

There are several ways to interpret the results of the ordered probit. The signs and statistical significance of the coefficients present some information about the model. The absolute magnitude of the coefficient estimates has no meaning. The impact on the intermediate

[19] For an example of a general ordered probit model, see Brownstone and Golub (1992) or Becker and Kennedy (1992). See also Greene (1997).

classification value (FTA) of a change in the explanatory variables is indeterminate whereas on the lowest and highest, the impact is irrevocable. A positive signed coefficient indicates a decrease in the probability of the lower threshold and an increase in the probability of the higher threshold, i.e., the change in the likelihood of observing the first and last choices. The statistical significance thus indicates a relationship between the independent variables and the dependent variable, but it does not indicate the magnitude of the effect.

Two periods are examined: the overall period 1960-1998 and the later period 1987 -1998. Note that the latter, 11-year span, marks a decade of significant international changes: a large number of RTAs were notified to the WTO in the 1990s; the Cold War alliances dissolved; and a number of new countries formed. The results of the estimation are examined in Section 4 below.

4 Results

4.1 1960-1998 Estimates

The empirical analysis of levels of regional integration suggests that economic freedom and institutional development, while not conclusive, do play a role in the choice of regional integration agreement. Examining **Table 1**, both trade uncertainty, as measured using the traditional measure of openness, and democracy are positive and significant. This implies that increased trade uncertainty and the characteristic of democracy both contribute to the probability of a country choosing higher levels of regional integration.

GDP per capita is also significant and positive. This implies that wealthier countries have a greater probability of belonging to a high level RIA. This result is brought about by the European Union. However, island nations are less likely to increase their level of RIA

participation, as are large nations, while land-locked countries are positively correlated with a RIA. Population is also a positive and significant contributing factor. This implies that nations with large populations are more inclined to increase their level of RIA participation.

When a tariff measure is instead used as a measure for trade uncertainty, it is significant at the 20% while all other variables retain their signs and their significance. It is important to note that when the Corruption Index from Transparency International is combined with the traditional measure of openness, neither measure is significant. This implies that either the combination of political and economic uncertainty does not contribute to a choice of RIA level, or there is significant collinearity. We rule out collinearity since the correlation coefficient is less than 50%. In addition, population and being a landlocked country are no longer significant.

Very high levels of political uncertainty may deter the ability of a government to be able to commit to participation in a RIA. In addition, governments may not have access to the resources necessary for the pursuit of new institutional constructs, i.e., membership in a RIA. However, none of the other measures of political uncertainty were significant.

Neither business cycle uncertainty nor price uncertainty is a significant contributing factor to the probability that a country increases its level of RIA participation. If the percent of government expenditure (size of government) is accounted for, trade uncertainty is also no longer significant. This result confirms the idea that countries expand social spending to help combat trade uncertainty as postulated by Rodrik (1987).

However, when remoteness is included as a measure of distance between countries, it is negative and highly significant. Thus, remote countries are unlikely to form ‘deep’ RIAs as are island nations and those with large land areas combined with large populations. This implies that denser, more contiguous countries are more likely to form ‘deeper’ RIAs.

Membership in a multilateral organization such as the IMF or the OECD is also positive and significant. This implies that countries who are members of multilateral organizations are more likely to join deeper levels of RIAs. Thus, multilateral participation as hypothesized, has become more significant and is important in the decision to join a RIA.

4.2 1987-1998 Estimates

Are the characteristics of the last decade in the data significantly different from those of the overall period? Examining **Table 2**, we observe that most signs and significance levels are the same except for the traditional measure of trade openness; now insignificant as a measure of trade uncertainty. When the Trade & Openness Index (TOI) from EFW is used in the place of the traditional trade openness measure, it is negative and insignificant. Per capita GDP is significant and positive. However, when the TOI index and the traditional measure of trade openness are together in an order probit, neither are significant and both are negative. I interpret this as evidence that trade uncertainty alone had a modest impact on the increase in regional integration post-Cold War.

Price uncertainty and business cycle uncertainty are negative but not significant. Significance of business cycle and price uncertainty would positively contribute to the probability of belonging to a RIA; inferred to be a Latin American effect. However, per capita income, democracy, and the geographic characteristics seem to be better indicators of the probability of participation in a certain level of RIA in this later period.

4.3 Bivariate Probit Estimates

In order to control for the possibility of bias due to presence of highly developed, industrial countries in deeper forms of RIA's, the sample is collapsed to a bivariate probit model. In doing so, the RIA indicator is collapsed to a dummy variable where participation in a FTA or any higher level of regional integration is denoted by a 1. Sectoral cooperation is not considered a formal FTA and thus is coded with non-participation as a zero. The results are reported in **Table 3**.

Examining **Table 3**, it is immediately apparent that the results do not differ greatly from the ordered probit results for the same time period. All signs and significance levels remain the same except for tariffs, which are no longer significant. Now, we are able to conclude that the probability of joining a RIA is influenced by the democracy level as well as geographic characteristics. Only trade uncertainty as defined through the traditional trade openness measure, is of contributive importance to a country's participation in a FTA or another form of regional integration arrangement.

Once again, we examine the post-1987 time period to investigate whether there are significant differences in characteristics. From **Table 4**, it appears that in the Post Cold-War period, none of the four measures of uncertainty: trade, political, price or business cycle uncertainty, is a good indicator of whether a country will belong to an RIA. Per capita income seems to be a good indicator when other institutional development, as shown by the level of democracy, is taken into account. Geographic characteristics are evidently much less important in this period. None of the included geographic characteristics are consistently significant. This suggests that in this later time period, the other non-geographic factors were essential. In addition, it is clear that there is a difference between RIAs formed in the early and later periods.

5 Conclusion

This paper had two objectives: first, to isolate those common traits of RIAs and define contributing characteristics. Secondly, to explicitly test for whether economic and/or political uncertainty is a positive contribution factor to the chosen level of trade integration. Four measures of uncertainty were tested: trade uncertainty; political uncertainty; business cycle uncertainty, and price uncertainty. As a result of the natural ordering of the regional integration data set, developed in this paper, an ordered probit maximum likelihood estimation was used to examine those factors which were likely to contribute to the probability that a country belongs to a regional integration agreement. Only trade uncertainty was of any significance.

This paper has provided a more complete empirical test to identify factors contributing to different levels of RIA participation. Using the level of regional integration as the dependent variable, a probit model was developed and tested. Data on regional integration has not been previously gathered in a systematic manner. A database of regional integration was developed which ranks the levels of integration across countries.

What are the characteristics of countries joining regional integration arrangements? High-income, democratic countries with high populations who are landlocked and are not islands are more likely to belong to deeper levels of regional integration. It is expected that developing countries do not have solid institutions designed to support deep levels of RIA. This is reflected in the importance of democracy, a variable consistently significant across time.

High per capita income is a good indicator of countries belonging to higher levels of regional integration which may be referred to as a European Union effect. Per capita income is

positive and statistically significant. From **Table 4**, it is apparent that when the ordered regional integration levels are collapsed into a binary system for the 1987-1998 period, with the exception of democracy and per capita income, most indicators no longer significantly contribute to enhance the probability that a country belongs to an RIA. This result signals that there has been a shift in country's motivations. One plausible hypothesis is that the international community experienced a shift. This shift, in my opinion, is a result of the fall of the Berlin Wall and the subsequent end of the Cold War.

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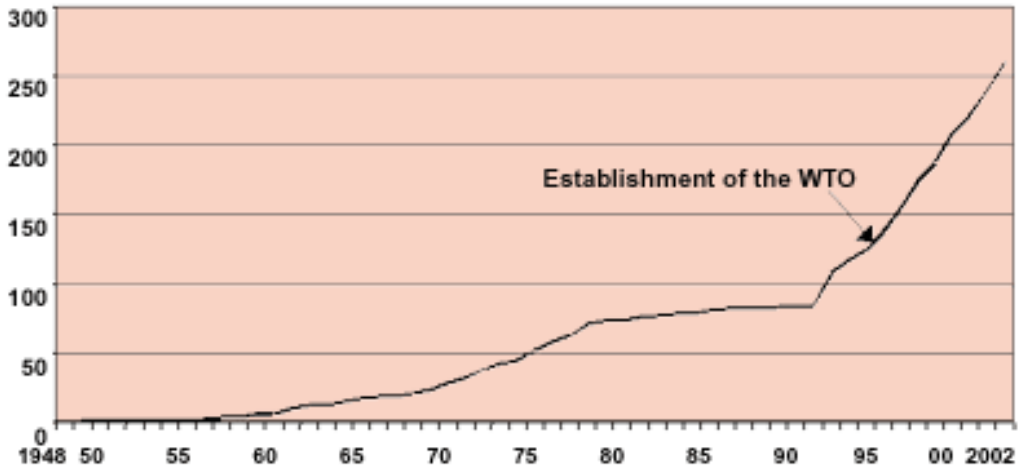
***Figure 1 :*Evolution of Regional Trade Agreements in the World 1948-2002**
Number of RTAS

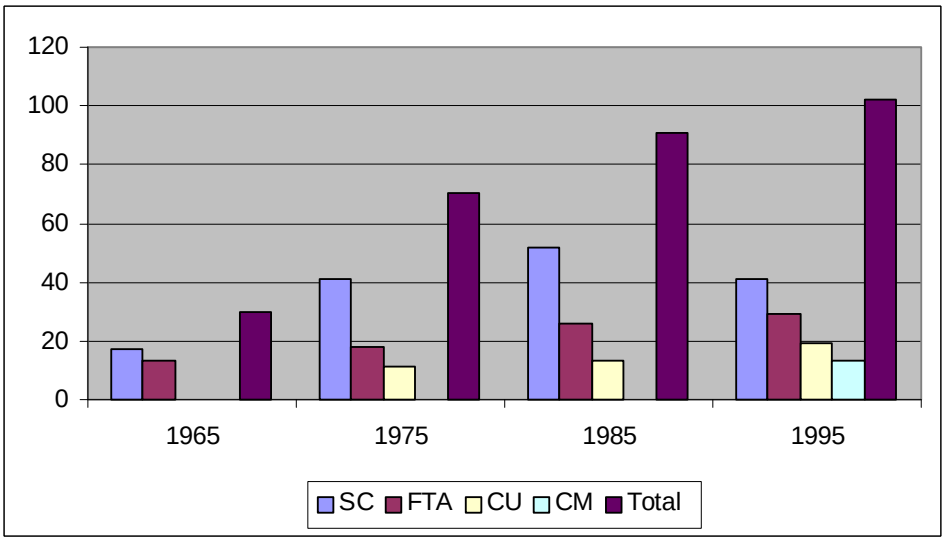


Source: WTO Secretariat, 2003

Figure 2 : Types of Regional Integration Arrangements

Features: Forms :	Removal of internal quotas and tariffs	Common external tariff	Free mobility of factors of production	Harmonized monetary & fiscal policy	Integration of political & economic policy
Sectoral Cooperation (1)					
Preferential or Free Trade Area (2)					
Customs Union (3)					
Common Market (4)					
Economic Union (5)					
Supra-national Union (na)					

Figure 3
Regional Integration in 150 countries 1965-1995



The number of included regional integration arrangements in each year. There are a total of 102 multilateral arrangements in 1995. Note that the WTO counts each bilateral agreement whereas here, the entire regional integration arrangement is counted as one agreement. Sectoral Cooperation (SC), Free Trade Agreement (FTA), Customs Union (CU), and Common Market (CM). Participation is determined as outlined in Figure 2. Source: Own calculations.

Table 1: Ordered Probit Regression Y= Regional Integration, 1960-1998

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	**0.346**	**0.273**	**0.483**	**0.443**	**0.344**	**0.348**
	(0.023)	**(0.036)**	**(0.108)**	**(0.109)**	**(0.23)**	**(0.023)**
Democracy	**0.056**	**0.075**	**0.134**	**0.152**	**0.057**	**0.051**
	(0.005)	**(0.007)**	**(0.021)**	**(0.021)**	**(0.005)**	**(0.005)**
Population	**0.000**	**0.00**	-0.00	-0.00	**0.00**	**0.00**
	(0.00)	**(0.00)**	(0.00)	(0.00)	**(0.00)**	**(0.00)**
Land area	**-0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.00**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Landlocked country	**0.298**	**0.179**	-0.361*	-0.418	**0.308**	**0.310**
	(0.045)	**(0.667)**	(0.179)	(0.180)	**(0.045)**	**(0.045)**
Island	**-1.00**	**-0.633**	**-1.34**	**-1.395**	**-0.984**	**-0.979**
	(0.059)	**(0.076)**	**(0.258)**	**(0.264)**	**(0.060)**	**(0.059)**
Openness	**0.142**			0.217		
	(0.031)			(0.124)		
Tariffs		-0.008 **				
		(0.003)				
TI Corruption Index			-0.013	-0.267		
			(0.038)	(0.038)		
GDP growth					0.003	
					(0.003)	
Inflation rate						-0.001
						(0.001)
	N=4186	N=1976	N=327	N=329	N=4130	N=4132

Note: Dependant variable is regional integration; ordered as described in the text. Openness is the log of exports and imports as a percent of GDP. The Corruption Index comes from Transparency International. Tarriffs are import duties as a percent of imports from the World Bank, WDI. Maximum likelihood estimation of ordered probit, four-way choice model. Bold face indicates p-value significance at 1%, * indicates significance at 10%. ** indicates significance at 20%.

Table 2: Ordered Probit Regression
Y= Regional Integration, 1987-1998

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	**0.259**	**0.391**	**0.507**	**0.256**	**0.263**	**0.444**
	(0.032)	**(0.047)**	**(0.117)**	**(0.032)**	**(0.032)**	**(0.057)**
Democracy	**0.093**	**0.089**	**0.139**	**0.097**	**0.096**	**0.114**
	(0.009)	**(0.010)**	**(0.023)**	**(0.009)**	**(0.009)**	**(0.016)**
Population	-0.00	0.00	-0.00	-0.00	**-0.00**	-0.00
	0.00	(0.00)	(0.00)	(0.00)	**(0.00)**	(0.00)
Land area	**-0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.00**
	0.00	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Landlocked	0.158	0.085	-0.357	0.182 *	**0.189**	**0.291**
country	(0.071)	(0.095)	(0.194)	(0.071)	**(0.072)**	**(0.116)**
Island	**-0.865**	**-0.569**	**-1.52**	**-0.882**	**-0.869**	**-0.913**
	(0.101)	**(0.112)**	**(0.295)**	**(0.101)**	**(0.099)**	**(0.213)**
Openness	0.069					
	(0.057)					
Tariffs		-0.002				
		(0.004)				
TI Corruption			0.002			
Index			(0.043)			
GDP growth				-0.004		
				(0.004)		
Inflation rate					-0.002	
					(0.001)	
Trade Policy IEF						-0.046
						(0.051)
	N=1459	N=934	N=279	N=1428	N=1430	N=456

Note: Dependant variable is regional integration; ordered as described in the text. Openness is the log of exports and imports as a percent of GDP. The Corruption Index comes from Transparency International. Tarriffs are import duties as a percent of imports from the World Bank, WDI. Trade Policy measure comes from EFW. Maximum likelihood estimation of ordered probit, four-way choice model. Bold face indicates p value significance at 1%, * indicates significance at 10%. ** indicates significance at 20%.

Table 3: Bi-variate Probit Regression
Y= Regional Integration, 1960-1998

	(1)	(2)	(3)	(4)	(5)
GDP per capita	**0.146**	**0.173**	**0.209**	**0.145**	**0.147**
	(0.012)	**(0.019)**	**(0.055)**	**(0.011)**	**(0.011)**
Democracy	**0.024**	**0.028**	**0.035**	**0.024**	**0.023**
	(0.002)	**(0.004)**	**(0.009)**	**(0.002)**	**(0.002)**
Population	**0.00**	**0.00**	0.00	**0.00**	**0.00**
	(0.00)	**(0.00)**	(0.00)	**(0.00)**	**(0.00)**
Land area	**-0.00**	**-0.00**	**-0.00**	**-0.00**	**-0.00**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Landlocked country	**0.178**	**0.155**	-0.098	**0.184**	**0.184**
	(0.22)	**(0.035)**	(0.103)	**(0.022)**	**(0.022)**
Island	**-0.267**	**-0.228**	**-0.589**	**-0.267**	**-0.265**
	(0.015)	**(0.03)**	**(0.075)**	**(0.016)**	**(0.016)**
Openness	**0.056**				
	(0.012)				
Tariffs		0.002			
		(0.002)			
TI Corruption Index			-0.013		
			(0.018)		
GDP growth				0.001	
				(0.001)	
Inflation rate					0.00
					(0.00)
	N=4186	N=1976	N=329	N=4130	N=4132

Note: Dependant variable is regional integration. Openness is the log of exports and imports as a percent of GDP. The Corruption Index comes from Transparency International. Tarriffs are import duties as a percent of imports from the World Bank, WDI. Maximum likelihood estimation of bivariate probit. Bold face indicates p-value significance at 1%, * indicates significance at 10%. ** indicates significance at 20%.

Table 4: Bi-variate Probit Regression
Y= Regional Integration, 1987-1998

	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	**0.128**	**0.251**	**0.193**	**0.123**	**0.127**	-0.014
	(0.018)	**(0.029)**	**(0.054)**	**(0.018)**	**(0.018)**	(0.019)
Democracy	**0.029**	**0.027**	**0.030**	**0.031**	**0.030**	**0.016**
	(0.004)	**(0.006)**	**(0.009)**	**(0.005)**	**(0.004)**	**(0.004)**
Population	0.00	0.00	0.00	0.00	0.00	**-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	**(0.00)**
Land area	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Landlocked	0.087 *	0.103	-0.091	**0.098**	**0.100**	0.077
country	(0.036)	(0.052)	(0.103)	**(0.036)**	**(0.036)**	(0.025)
Island	**-0.301**	**-0.218**	**-0.603**	**-0.311**	**-0.305**	-0.107
	(0.035)	**(0.048)**	**(0.084)**	**(0.035)**	**(0.035)**	(0.062)
Openness	-0.007					
	(0.027)					
Tariffs		0.004				
		(0.002)				
TI Corruption			-0.129			
Index			(0.019)			
GDP growth				-0.001		
				(0.002)		
Inflation rate					-0.001	
					(0.001)	
Trade Policy						0.006
IEF						(0.015)
	N=1459	N=934	N=279	N=1428	N=1430	N=456

Note: Dependant variable is regional integration. Openness is the log of exports and imports as a percent of GDP. The Corruption Index comes from Transparency International. Tarriffs are import duties as a percent of imports from the World Bank, WDI. Maximum likelihood estimation of bivariate probit. Bold face indicates p-value significance at 1%, * indicates significance at 10%. ** indicates significance at 20%.

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