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New Determinants for New Free Trade Agreements: Governance, Interdependence and Vertical Specialisation

**Javier Lopez Gonzalez**

**University of Sussex**

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# *First Draft For Comment*

# New Determinants for New Free Trade Agreements: Governance, Interdependence and Vertical Specialisation

Javier Lopez Gonzalez[[1]](#footnote-1)

University of Sussex

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**Abstract**

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## Introduction

The well documented rise in regionalism has motivated a growing interest in looking at the determinants of free trade agreements (FTAs). The traditional empirical models of FTA formation, inspired by Baier and Bergstrand (2004), suggest that larger, similar and neighbouring countries have traditionally not only exhibited higher trade flows but have also been more likely to engage in FTAs (Baier et al. 2008). The fundamental hypothesis driving these models is that economic characteristics that make ‘good’ trading partners can predict the incentives that motivate the formation of successful trading arrangements. In contrast, the political economy models of FTA formation see agreements arising from an internal ‘bidding’ process between domestic interest groups (Grossman and Helpman, 1995; and Ornelas, 2005a,b,c). But evidence suggests that regionalism comes in waves (Ethier, 1998; Burfisher et al. 2003; WTO, 2011; and Baldwin, 2011), and that the partners involved in different waves display different characteristics. This then suggests that the economic and political economy determinants of FTAs may be evolving[[2]](#footnote-2).

It is herein argued that the changing nature of trade, witnessed by the recent growth in vertical specialisation (VS), gives rise to new incentives to form new agreements and that this has spurred the new wave of *21st century regionalism* (Baldwin, 2011).

The comparative static evidence presented in this paper shows that new preferential partners are more distant and less similar in their factor endowments than preferential partners involved in earlier waves of regionalism. This is a manifestation of changing conditions in the game of regionalism. This paper puts forward the idea that the changing nature of trade, which involves complex and interconnected modes of international production, leads to changes in the incentives that determine the formation of new agreements through three distinct channels.

1. Via changes in the internal political economy dynamics;
2. Through a greater demand for appropriate regulatory frameworks that cater for the complexities of new economic transactions; and
3. By way of interdependence effects that are created from the wider spread of production across international borders.

These new channels of influence may help form a better understanding of the drivers of new trade agreements which involve not only new partners but also the negotiation of ‘deeper’ agreements that deal with behind-the-border measures (Baldwin, 2011; Orefice and Rocha 2011; and WTO 2011).

The role of vertical specialisation in the formation of new FTAs is indirect; in part, it acts through changes in the internal political economy forces that determine the conclusion of FTAs (in the guise of the theoretical models of Grossman and Helpman, 1995 and Ornelas, 2005a,b,c). A growing dependence on intermediate imports over domestic intermediates, or a rising VS, goes hand in hand with a diminishing influence of import competing firms in veering government decisions towards protectionist measures. This then results in the emergence of a larger relative lobbying mass in favour of more liberal policies. It suggests that countries that are more vertically specialised should be more likely to conclude FTAs. This is corroborated by the results of this paper which show that a 1% increase in the change in bilateral vertically specialised trade raises the likelihood of countries switching into an agreement by 9 percentage points. It also shows that countries which exhibit more globally vertically specialised *structures* of production are more likely to conclude FTAs.

The rising complexity of international trade transactions may also lead to a greater demand for bilateral regulatory harmonisation (Orefice and Rocha, 2011). This has made 21st century regionalism ‘deeper’ than traditional trade agreements (Burfisher et al. 2003; Ethier, 1998; Baldwin, 2011; and Orefice and Rocha, 2011). A link between vertical specialisation, regulatory structures and FTAs arises from the theoretical work of Antras and Staiger (2011). They suggest that *hold-ups,* which lead to inefficiently low levels of offshoring across countries, can be mitigated through the adoption of relationship specific regulatory frameworks[[3]](#footnote-3). These can take the form of deeper trading arrangements that cater for the idiosyncrasies of value chain activity. Following these insights, the idea that the desirability of engaging in a new trade agreement could be tied to the prevailing regulatory environment is put forward. Evidence supporting this claim is provided where it is shown that the inclusion of a variable that captures the minimum quality of the regulatory environment between two countries helps increase the predictive powers of an augmented FTA formation model. Increases in regulatory quality are associated with higher probabilities of agreements being concluded however low measures of regulatory quality may also incite countries to sign new and deeper agreements in order to redress shortfalls in regulatory frameworks.

The wider delocalisation of segments of production also gives rise to greater interdependencies between agreements. The desirability of a trade agreement between two countries has been shown to depend on the participation of these countries in other FTAs (see Baldwin’s (1993) domino theory of regionalism). Several papers have highlighted the role of these interdependence effects in the formation of trade agreements (Baldwin, 1993; Egger and Larch, 2008; Baldwin and Jaimovich, 2010 and Baier et al, 2010). However none has looked at the impact of interdependencies arising from the spread of vertically specialised trade as is done in this paper. Here too supportive evidence on the positive impact that these play on the probability of an FTA being concluded is provided.

Preliminary evidence of a link between the changing nature of trade and the creation of new FTAs is most apparent in South East Asia. Here the well documented rise in regional vertical specialisation, leading to the emergence of ‘factory Asia’ (Baldwin 2006b), seems to have motivated a rising demand for new and deeper trading arrangements (see WTO, 2011 and Baldwin, 2011). However such links are not confined to this region as the work of Orefice and Rocha (2011) suggests. They find that, in general, countries which trade more intermediate imports also tend to form ‘deeper’ agreements. This suggests that the changing nature of trade may be leading to a qualitatively different form of regionalism (Baldwin, 2011). This then highlights the importance of looking at new drivers of new regionalism, not least to identify emerging challenges that will be faced by the global trading system.

In capturing the impact of vertical specialisation on the probability that two countries engage in an FTA one is confronted with two separate issues of *endogeneity* which bias coefficient estimates*.* The first arises from *unobserved heterogeneity* whereas the second is caused by *simultaneity.* The latter occurs through the influence of FTAs on current trade flows and suggests the use of pre-agreement measures of trade flows in estimating FTA formation models. Unobserved heterogeneity then arises from the presence of unobserved variables (to the econometrician) which simultaneously affect both the probability of countries engaging in an FTA and also the levels of vertically specialised trade between these (as shown in Lopez-Gonzalez, 2012). However, the typical solution of using a FE estimator (see Baier and Bergstrand, 2007) is not readily applicable. The binary nature of the dependent variable in an FTA formation model raises ‘incidental parameters’ problems (Neyman and Scott, 1948[[4]](#footnote-4)) which cause complications in the estimation of binary panel data models with fixed effects. Hence controlling for unobserved heterogeneity, in an FTA formation model, requires the use of different control mechanisms.

This paper tackles issues of endogeneity through cross-sectional and panel data approaches. The cross-sectional models rely primarily on a First Difference (FD) approach which looks at how *changes* in variables affect *switches* in FTA status. In addition, an instrumental variable (IV) approach is also used to introduce exogenous variation in the trade measures. In the panel data specifications, the unobserved elements that co-determine flows of vertically specialised trade and FTAs are isolated through; a conditional logit model; a panel IV approach; and a Mundlak-Chamberlain transformation. The empirical results support the claim that the changing nature of trade is affecting the incentives that lead to the formation of new agreements.

This paper is organised as follows. The next section reviews how the characteristics of countries involved in the different waves of regionalism have evolved. It argues that changes in these characteristics support the need of a more focused study on the determinants of *new* trade agreements. Section 3 then discusses the role of the changing nature of trade in the formation of FTAs. In section 4, details of the database and indicators that will be used in the empirical section are presented. Section 5 then discusses the empirical models that are used to obtain the results presented in section 6. The final part of this paper concludes and provides some policy implications and further avenues for research.

## Waves of Regionalism: old, new and New New?

Regionalism is often described as a process that unfolds across different *waves*. This characterisation implicitly supports the notion that there exist changing circumstances that motivate these or that these exhibit different defining characteristics. Four different waves of regionalism are identified by Mansfield and Milner (1999). The first comes about with the emergence of green-shoots of European bilateralism in the 19th century and lasts till the beginning of the First World War. The interwar period then gives rise to a second wave of short-lived regionalism where discriminatory practices breed contentions amongst states which are unable to conclude multilateral agreements (Mansfield and Milner, 1999). But it is the third and fourth waves of regionalism, since the end of the Second World War, that are most discussed in the literature. These are concurrent with multilateral liberalisation and are often referred to as the old and the new waves (Burfisher et al., 2003, Baldwin, 1997, Ethier, 1998, and Baldwin 2006a)[[5]](#footnote-5). Although the historical and empirical narrative tends to be concerned with the impact of these concurrent processes (see Mansfield and Milner, 1999, Mansfield and Reinhardt, 2003, and Baldwin, 1997), the focus of this section is that of identifying the changing nature of the partners involved in each wave. This is to ascertain whether there are significant differences between old and new regional partners, and hence to establish if there is any prima facie evidence of new *new* regionalism (or *21st century regionalism* according to Baldwin, 2011).

The precise moment when new regionalism took over from old regionalism is hard to pinpoint. Mansfield and Milner (1999) place the third wave between the 50’s and the 70’s with the creation and expansion of the European Economic Community (EEC) and the European Free Trade Area (EFTA)[[6]](#footnote-6). However Baldwin (1997) places the birth of the new wave a little later, during the 80’s. He argues that it arises from the *domino forces* created by the earlier Eurocentric round of preferential liberalisation[[7]](#footnote-7). These motivate the US to engage in bilateral trade deals as seen through the agreements with Israel and Canada and the beginning of negotiations with Mexico (Bhagwati, 1993; Baldwin, 1997; and Mansfield and Milner, 1999)[[8]](#footnote-8).

Instead of focusing on the origins of new regionalism, Ethier (1998) underlines its characteristics. He argues that new regionalism involves a more diverse set of countries that engage in a wider range of negotiating issues. This qualitative change in the issues negotiated, and indeed the deepening of the provisions between preferential partners, is also what constitutes the distinction between old and new regionalism according to Burfisher et al (2003) and Baldwin (2011)[[9]](#footnote-9). However, whereas the former focuses more to the deepening of traditional agreements such as EU, the latter argues that the qualitative changes in negotiating issues arises as a direct response to changes in the typology of international transactions or - the *second unbundling.* Baldwin (2011) places these changes outside the traditional, or older, preferential blocks. The increased geographical distribution of production sequences across international borders, facilitated by reductions in coordination costs, leads to a greater demand for international disciplines. These typify *21st Century regionalism* which is distinct from new regionalism in this respect.

This latest wave of regionalism involves new partners that share an increasing willingness to arrive at common and deeper understandings in; investment provisions; competition policy; and intellectual property rights[[10]](#footnote-10). Baldwin (2011) argues that these new found commonalities arise from a growing impetus in bolstering the trend that sees production locating in many different and international locations. He calls this the “trade-investment-services nexus” which, although representing a complex range of issues, manifests itself through the rise in vertically specialised modes of production. Baldwin’s (2011) assertions lend themselves to the hypothesis that the rise in this type of trade, or the rising complexity in international economic transactions, should increase the demand for international arrangements in the form of new and deeper FTAs[[11]](#footnote-11).

### Characteristics of FTA Partners

Before turning to a more sophisticated analysis of the impact of the changing nature of trade on the formation of new trade agreements, a preliminary examination of the key characteristics of preferential partners is warranted. The stylised facts that emerge can help identify the evolving features of the partners that are engaging in FTAs across the different waves of regionalism.

Using CEPII’s gravity database, which covers the universe of available dyads from the late 50’s to 2006, 3 characteristics of preferential partners, whose choice is motivated by Baier and Bergstrand’s (2004) seminal paper on the topic, are charted[[12]](#footnote-12). These are chosen to capture:

1. trading costs - through distances;
2. economic mass - through the absolute difference in the log of GDPs; and
3. differences in the composition of capital labour ratios - identified by way of the absolute difference in the logs of GDP per capita[[13]](#footnote-13).

Dyads are then classified according to whether they share an FTA or not in the year 2006[[14]](#footnote-14). Figure 1 maps the differences between preferential and non-preferential partners in terms of distance. The density plots confirm a well known facet of regionalism – *preferential partners are close in proximity*. However, it also reveals the presence of a ‘hump’ nearing the end of the distribution of the FTA plot suggesting that more distant economies are also engaging in trade agreements.

**Figure 1: Characteristics of FTA partners - Distance**



**Source:** Calculations from CEPII’s gravity database. FTA is identified if dyad shares an agreement in 2006

**Note:** Distance = log of the distance between dyads

Figure 2 then looks at the distribution of the economic characteristics of dyads that share an FTA versus those that do not. The left panel (1) shows the absolute difference in the logs of GDP in the year prior to an agreement being signed. The panel on the right (2) maps the absolute difference in the logs of the GDP per capita across dyads in the year prior to an agreement being concluded. Panel (1) suggests that countries that are part of an agreement, in 2006, share a greater similarity in their GDP than those that did not participate in an FTA. The right hand panel then shows that FTA partners also share a smaller difference in income[[15]](#footnote-15). The stylised fact that emerges from these plots is that - *FTA partners tend to exhibit smaller absolute differences in both economic mass and income*.

**Figure 2: Characteristics of FTA partners – Economic Mass and Income**



**Source:** Calculations from CEPII’s gravity database, economic data for year the agreement came into force. FTA is identified if dyad shares an agreement in 2006.

### Characteristics Across the Different Waves of Regionalism

Much of the literature on new regionalism highlights the involvement of new partners (Ethier, 1998; and Burfisher et al., 2003). However, little has been said about the characteristics of these countries. Identifying the evolving characteristics of the countries involved in the different waves of regionalism can shed light on important qualitative differences in the characteristics of the different waves. These can be captured by looking at how, and if, the above presented stylised facts have changed across the waves. This requires defining the time periods that each wave occupies.

Dropping Mansfield and Milner’s (1999) original first and second waves of regionalism due to lack of data, and following Bhagwati (1993) and Baldwin (1997); a first wave of regionalism is herein identified for the period between 1960 and 1985. A second wave is then defined for new agreements that enter into force in the period 1985-1995[[16]](#footnote-16). The last wave of regionalism then captures new agreements signed from 1995 to 2006[[17]](#footnote-17). Since the 1960’s 1394 dyads are identified as having signed an FTA out of a possible 24,976 dyads. Our first wave saw the creation of 232 agreements; the second, the birth of 421; whilst the third, the creation of 741 agreements[[18]](#footnote-18). These numbers support the well documented rise in the formation of FTAs during the last decades.

Figure 3 presents a kernel density plot that maps the distribution of distances between preferential partners according to the identified waves of regionalism. The first observation that emerges is that the plotted distributions move towards the right as new waves of regionalism unfold. Although differences between the solid distribution, that identifies the first wave of regionalism, and the dotted one, that captures the second, appear to be small, the mean of the latter is somewhat higher. However it is the distribution of the distance between countries involved in the third wave which is most revealing. This is not only because it exhibits a higher mean, but also because it suggests that the ‘hump’ that appeared in Figure 1 is a new phenomenon[[19]](#footnote-19). The stylised fact that emerges from this analysis is that *the different waves are progressively involving countries that are more distant*[[20]](#footnote-20)*.*

**Figure 3: Distance between FTA partners across the three last waves of regionalism**



**Source:** Calculations from CEPII’s gravity database. First Wave identifies new agreements signed between 1960 and 1984. Second wave identifies new agreement signed between 1985 and 1994 and the third wave captures new agreements concluded between 1995 and 2006. Distance is measures as the log of bilateral distance.

Looking at the characteristics of preferential partners in terms of their similarity in economic mass reveals quite an uneven pattern (Figure 4). The first wave seems to involve countries with similar GDPs, however less so than the countries participating in the second wave of regionalism. Those that participated in the third wave then appear to exhibit a flatter distribution which suggests falling similarities in economic mass. Although there is no clear pattern in this figure, it seems that the first wave was more similar to the third than to the second wave. *FTA partners are still relatively similar, in terms of their economic mass, although less so for new agreements than for old ones.*

**Figure 4: Difference in economic mass between FTA partners across the three last waves of regionalism**

**Source:** Calculations from CEPII’s gravity database data from first year of each wave. First Wave identifies new agreements signed between 1960 and 1984. Second wave identifies new agreement signed between 1985 and 1994 and the third wave captures new agreements concluded between 1995 and 2006. Differences in economic mass are measures through the absolute difference in the logs of the GDPs of the dyads.



Figure 5 then plots the difference in incomes across the waves of regionalism. Here a more discernible pattern emerges. The first wave clearly involves countries which share stronger similarities in their incomes. However as the second and third waves unfold this pattern begins to break and preferential partners become more dissimilar in their income. The third wave clearly has a much flatter distribution suggesting that *countries that engage in recent trade agreements tend to be much more dissimilar in income than in any other wave*[[21]](#footnote-21)*.*

**Figure 5: Differences in income between FTA partners across the three last waves of regionalism**



**Source:** Calculations from CEPII’s gravity database, data from first year of each wave. First Wave identifies countries that signed a trade agreement between 1960 and 1984. The Second wave requires there to be a new agreement between 1985 and 1994 whilst the third captures new agreements signed between 1995 and 2006. Differences in income are measures through the absolute difference in the logs of the GDP per capita of the dyads.

The ‘stylised facts’ that emerge from this analysis point to evolving features in the characteristics of new preferential partners. Whilst the first wave occupied countries of similar economic mass, income and distance, the third wave appears to involve more distant economies that are more dissimilar in their income[[22]](#footnote-22). These observations may lend supportive evidence to Baldwin’s (2011) claim for a separate analysis of 21st century regionalism. The implications of these changes are also important. Similarities in income reflect similarities in the factor composition of trade (Egger and Larch 2008), and hence the new wave of regionalism seems to be taking place between countries that are more dissimilar in their factor endowments. Although traditional models of trade would suggest that forming agreements between countries that share such differences in comparative advantages makes economic sense, Mansfield et al. (2008) argue that political support for this type of agreement may be complicated due to the unequal distribution of factor rewards[[23]](#footnote-23). This implies that, often “good politics drives out good economics” (Mansfield et al. 2008:p69), or that agreements between countries with similar factor endowments may be politically easier to conclude[[24]](#footnote-24). Hence the changing characteristics of preferential partners may then be manifesting changes in the political economy conditions that determine the formation of FTAs. These might arise through changes in the nature of international transactions.

If the changing nature of trade is linked to changes in the desirability of engaging in a trade agreement then one could expect that countries that engage in new FTAs have seen their degree of vertical specialisation rise the most. Figure 6 provides prima facie evidence of this. It presents a kernel distribution plot of changes in the value of the log of vertically specialised trade, between 1995 and 2008, according to whether countries signed a new agreement during the third wave[[25]](#footnote-25). It shows that new preferential partners experienced a higher growth in vertically specialised trade than those that did not sign an agreement. This provides the prima facie link between the changing nature of trade and FTAs which motivates the focus of this paper[[26]](#footnote-26).

**Figure 6: Change in VS and new FTAs in the third wave (reduced sample)**



**Source:** CEPII database for FTAs, Comtrade and OECD STAN database for calculation of the value of vertically specialised trade. Change in VS identified as the difference in the value of VS trade between 1995 and 2008

## The Changing Nature of Trade and FTAs

The literature on the determinants of FTAs is vast and has been concerned with an array of both causes and consequences. This section aims to give a non-exhaustive synthesis of this literature in view of determining how the changing nature of trade may affect the formation of new agreements[[27]](#footnote-27). This section begins with a more general discussion on how new forms of international production affect old, but still contentious, debates on the desirability of regionalism. This is followed by a more in depth discussion of the channels through which the changing nature of trade is expected to affect the formation of FTAs.

### Old Debates, New Insights?

During the 90’s, Jagdish Bhagwati emerged as the leader of a movement that condemned regionalism as being a malignant force in the path towards global free trade. His concerns about discriminatory trading arrangements were voiced through two major questions. Firstly, would these agreements increase or reduce world welfare? And secondly, would regionalism be a stepping stone (supplement) or a stumbling block (alternative) in the path towards “multilateral free trade for all” (Bhagwati 1993:p32)[[28]](#footnote-28). In his review, Bhagwati (1993) suggests that the first question is an empirical one. Global welfare should depend on the relative strength of the trade creating and trade diverting forces that arise from preferential trade deals (Viner 1950). The second question then requires assessing the political economy forces that motivate the internal and external support to pursue one form of liberalisation over another – the incentive structure.

Bhagwati’s concern was that these forces would lead to a fragmented world over a more favourable and all-inclusive non-discriminatory one. The debate is best summarised by Baldwin (1997). He argues that some see *discriminatory liberalisation* and focus on the benefits of liberalisation, whereas others focus on the discriminatory element and voice their concerns about its negative impact. Because the changing nature of trade is likely to be linked to both the impact of FTAs and the incentives that shape their desirability, an instructive exercise emerges from analysing how the rise in vertically specialised trade affects Bhagwati’s concerns[[29]](#footnote-29).

### Impact of Agreements

Bhagwati’s first question related to the impact of trade agreements on global welfare[[30]](#footnote-30). Here, the early work on FTAs, initiated by Krugman (1991a, 1991b), provides some important insights. Krugman captured the impact of block formation on world welfare by using trade costs to identify the trade creating and diverting forces at play. He found global welfare to be highly sensitive to the assumed structure of these costs. If these were to be zero, then Krugman (1991a) showed that FTAs unambiguously reduce world welfare, however when inter-continental trade costs are assumed to be prohibitive (Krugman 1991b) these results are reversed and FTAs become unambiguously welfare enhancing. This ‘Krugman vs Krugman’ debate (Frankel et al. 1995) spurred a flurry of papers that sought to capture the role of varying intra and inter-continental trade costs on welfare. Frankel et al (1995) and Frankel (1997) were examples of this. They extended the specifications of these costs along a continuum only to find similar ambiguities. Hence with theoretical support to global welfare enhancing and reducing scenarios, the debate would require an empirical appraisal to be settled.

Most empirical studies favour the idea that “trade creation has generally exceeded trade diversion” (Bergsten, 1997:p548), and hence that global welfare has risen as a result of regionalism. Baldwin (2011) provides a good summary supporting this view on the basis of the recent empirical evidence of Magee (2008) and Archarya et al. (2010). But he also argues that assessing global welfare, or the desirability of FTAs, through the quantification of the relative strength of Vinerian forces may be misguided. Agreements are no longer very preferential due to the high incidence of trade at zero MFN rates. Furthermore, high tariff, ‘sensitive’, products tend to feature prominently in lists of excluded goods in concluded FTAs. This leads to the existence of low preference margins and hence a low incidence of trade creation and trade diversion. Baldwin (2011) then argues that discriminatory liberalisation is no longer very discriminatory and hence FTAs should be seen as general liberalisation schemes[[31]](#footnote-31).

However, the findings of Lopez-Gonzalez (2012) suggest that even low preference margins can lead to large trade effects when modes of production are vertically specialised and hence that Vinerian economics may yet be important. The traditional empirical analysis of trade creation and diversion has largely focused on the well understood welfare implications of FTAs in the presence of competing trade in final products. However, if trade is increasingly taking place across complementary intermediate products, then a new understanding of how these forces operate, in the presence of vertically specialised sequences of production, becomes progressively important in assessing the global welfare implications of FTAs.

Trade creation and trade diversion are likely to operate in much more complex ways in the presence of such modes of international production. They may impact either or both the importing and exporting elements of international value chain activity and thus introduce complex dynamics which make their welfare implications hard to grasp. Understanding the global welfare implications of FTAs then requires identifying how FTAs affect international production. Lopez-Gonzalez and Holmes (2011) show that there appears to be a correlation between the degree of vertical specialisation and productivity growth. This might, in turn, suggest that this type of trade may be associated with higher welfare gains than those associated with traditional trade flows (allocative efficiency). In addition, Lopez-Gonzalez (2012) identifies the presence of ‘magnification effects’ suggesting a higher responsiveness of vertically specialised trade to trade costs. This may then imply that the associated Vinerian forces may too be ‘magnified’ and hence retain an important role in grasping the desirability of FTAs even in the presence of low preference margins.

Nevertheless, the complexity of new trading relations (Baldwin, 2011), and the possible role of trade agreements in enhancing *deep integration*, also suggests that it is important to go beyond Vinerian economics. In his exposition of 21st century regionalism, Baldwin (2011) also argues in favour of a wider focus on barriers that impede the *connection of* *international production facilities.* He identifies 4 such behind-the-border-barriers; competition policy; movement of capital; intellectual property rights; and investment assurances. These do not lend themselves to traditional Vinerian analysis because these need not be discriminatory in nature in the same way that preferential tariffs are. In fact removing such non-tariff barriers, even on a ‘preferential’ basis, may result in the creation of public goods that could benefit countries outside preferential agreements (Baldwin 2011)[[32]](#footnote-32). Hence, if FTAs are more efficient at promoting this type of regulatory reform, through ‘deeper integration’, this may lead to larger preferential and non preferential trade flows and hence important global welfare gains. This would suggest that FTAs may not be as ‘damaging’ as Bhagwati feared.

### Incentive Structures

The changing nature of trade may also introduce changes in the incentive structures that lead to one form of liberalisation over another (Bhagwati’s second question). However, evidence suggests that multilateralism and regionalism could be endogenous processes[[33]](#footnote-33). Mansfield and Reinhardt’s (2003) findings posit that it is the growing membership of the GATT/WTO that incites a country to embrace bilateral trade deals. As membership grows, a partner’s negotiating leverage falls and the uncertainties associated with a failure of the multilateral system rise. Like-minded countries are then pushed towards bilateral trade deals as an insurance mechanism against such failures[[34]](#footnote-34). Contrasting evidence also suggest the presence of reverse causality. Estevadeordal et al. (2008) show how regional liberalisation in Latin America may have led to reductions in applied MFN tariffs and Baldwin (2011) provides further evidence of this trend. He argues that, since the Doha Round began in 2001, there has been a concurrent increase in regionalism with an observed reduction in applied MFN tariffs (through unilateral liberalisation)[[35]](#footnote-35). This then suggests that different forms of liberalisation may be complementary rather than substitutes. The changing nature of trade may help explain why this arises.

As international fragmentation unfolds, so too do changes in the costs and benefits of engaging in liberalisation. The propagation of international production introduces the possibility of enhanced gains from liberalisation as comparative advantages are being exploited at a finer process rather than product level. And the costs of liberalisation, which are primarily political in nature, may also begin to fall. As countries become more interconnected, and trade in intermediate products increases, protectionism is likely to increasingly become a production tax rather than a measure that fosters, or protects, domestic production[[36]](#footnote-36). This may reduce the internal opposition towards liberalisation so that governments may begin to more freely embrace liberalisation as a form of industrial policy (This would cater for access to cheaper products for both consumers and producers).

Whether this liberalisation is unilateral, bilateral or multilateral is hard to tell. It may depend on the ease of negotiating one alternative over the other. However, because vertically specialised modes of production involve not only seeking access to cheap intermediate imports but also opening markets for the associated exported products, bilateral deals may be preferred. But one type of liberalisation does not preclude the other. And, in the presence of vertically specialised trade, unilateral and bilateral liberalisation may be complementary. Once liberalisation has been achieved on the export side, through an FTA, countries may seek to reduce their MFN tariffs so as to capture cheaper sources of intermediates and gain competitiveness in preferential markets[[37]](#footnote-37). The case of Mexico, shortly after concluding NAFTA, is a prime example of such a strategy[[38]](#footnote-38), and the earlier cited evidence provided by Estevadeordal et al. (2008) and Baldwin (2011) also lend support to this idea. If there are indeed complementarities between these processes of liberalisation then Baldwin’s (2011:p23) assertion that “the old building-stumbling-blocks approach is logically misstated” may hold true due to the endogenous nature of the different liberalisation strategies[[39]](#footnote-39).

However Antras and Staiger (2011:p.4) warn us that “the rise of offshoring can be seen to present the WTO with a profound institutional challenge”. Their argument is that this type of trade leads to a greater demand for deeper forms of regulatory cooperation which are moulded to the idiosyncrasies of the value chain interactions between countries. Because bilateral agreements may more readily cater for these, then they might be preferred to a multilateral alternative[[40]](#footnote-40). As the debate continues to gather momentum (see Bhagwati, 2008 vs Baldwin, 2011), and in the current climate where the Doha Round appears to falter, the only certainty is that “regionalism is here to stay” (Baldwin 2006a:p1451) whether for good or for bad. Understanding the forces that drive the formation of new FTAs is then crucial in assessing the likely direction of the multilateral trading system.

### Political Economy, Governance And Third Country Effects

Bhagwati (1993) anticipated that the incentives of three key agents would need to be considered in forming an understanding of the ‘threat’ of regionalism. Governments - who ultimately decide whether or not to pursue preferential liberalisation - would be the decision-making agents. These would be influenced by; consumers; domestic special interest groups; and interest groups located in third countries. Grossman and Helpman’s (1995) theoretical political economy model introduces some of these actors into a government’s objective function in an effort to model the forces that shape the decision of engaging in a trade agreement[[41]](#footnote-41). The choice of participating in an FTA is made after weighing the gains for voters and exporting industries against the possible losses that would befall import competing industries from the in or out scenarios. The nature of the game is one where industry interest groups make contributions, commensurate on profits, which aim to veer government decisions towards the outcome that is most favourable to their economic activity. Governments weigh these contributions against consumer welfare gains, identified through changes in tariff revenue and consumer surplus, and then make a decision on whether to engage in a trade agreement or not[[42]](#footnote-42).

Grossman and Helpman’s (1995) paper, and the literature that it inspires, uses a framework in which the decision to sign a trade agreement is made on the basis of the characteristics of two negotiating partners only. However Baldwin (1993 and 1997) suggests that the process of FTA formation may also be driven by neighbouring regionalism[[43]](#footnote-43). In his *domino theory of regionalism*, countries that are left out of neighbouring agreements are adversely affected by trade diversion which leads to losses in export market shares. These affect the internal political economy forces in favour of participating in an excluded FTA, or indeed a new FTA with other excluded members[[44]](#footnote-44). The main insight is that engaging in an FTA is not just a product of bilateral characteristics, but also one where third country effects matter. As markets get bigger, through regionalism, the costs of being left out of a preferential area increase as do the benefits from being inside.

Dominoes are then reinforced by a *juggernaut* effect. Tariff reforms carry with them a feedback mechanism that plays on the structure of the interest groups within a country. Once preferential liberalisation has been accomplished, inefficient import competing firms are likely to be pushed out of the market and hence their bargaining power should fall[[45]](#footnote-45). This shifts the lobbying mass further towards favouring more liberal policies which may then set off further dominoes. A similar idea is captured in Ornelas’ (2005a) theoretical model. Because political contributions are commensurate on the market shares of domestic firms, as these fall from opening the market to increased competition from FTA partners, so too does the weight of this factor in the governments objective function. This tilts the balance of the government’s objective function further towards a stance that favours and optimisation of consumer surplus through liberalisation.

### Political Economy Dynamics and the Changing Nature of Trade

Looking at the role of the changing nature of trade in this process requires identifying how the interest groups, which shape the political economy forces, are affected by the rise in vertically specialised trade. High or growing degrees of VS should manifest a high or growing presence of firms engaged in both import and export markets relative to import competing firms. In turn, these should be inclined to lobby in favour of more liberal policies which would afford them access to cheaper intermediate inputs (Manger 2009). Owing to the reciprocal nature of FTAs, these firms would also stand to gain from a preferential access into new export markets hence reinforcing this lobbying mass.

The previously highlighted changes in the characteristics of new regional partners (Figure 5), suggest that shifts in the political economy forces may already be taking place. The changing nature of trade, with the spread of vertical specialisation, may be closing the gap between good politics and good economics. The delocalisation of a segment of production, rather than an entire industry, may be more politically palatable. Hence if industries thrive as a result of liberalisation, through access to cheaper intermediates, then a new source of juggernaut effects, reinforcing liberalisation, may also arise at a cheaper political cost. With vertical specialisation, rather than having competing trade, one might be in the presence of complementary trade (Samuelson, 2001 and Bas and Strauss-Kahn, 2011)[[46]](#footnote-46). This implies that the Grossman and Helpman (1995) model need not see the reduction in prices caused by the formation of an FTA as an attack on producer surplus, but rather as a positive factor that contributes to the reduction in the costs of production. If this increases the profits of firms, and by extensions of the model, the political contributions, then liberalisation is likely to become a more favoured outcome for governments.

This implies that countries that exhibit greater degrees of *global* vertical specialisation should be more inclined towards favouring liberalisation and hence possibly FTAs. Moreover, because the presence of a bilateral production link between two countries should be indicative of a stronger interest, by both parties, in the successful conclusion of an agreement, then one could also expect higher levels of *bilateral* VS to be associated with a higher likelihood of an FTA.

### Regulatory Frameworks And FTAs

Although the changing nature of trade is expected to lead to further liberalisation, the type of liberalisation that will be supported remains unclear. On the one hand, multilateral (unilateral) liberalisation guarantees a wider access to cheaper sources of intermediate products. But on the other hand, such liberalisation may struggle to open markets for the associated exported product and also fall short in delivering desirable harmonised regulatory frameworks that may be needed in the presence of more complex economic transactions. Nunn (2007) makes an interesting link between trade and regulatory frameworks in the presence of ‘relationship-specific’ economic activity. He argues that internationally sequenced modes of production, or the customisation of inputs, tend to require relationship specific investment. The lack of appropriate regulatory structures that promote contract enforcement may lead to underinvestment that raises the costs of producing both intermediate and final products. He then argues that appropriate regulatory structures can deliver comparative advantages in the production of output.

If common cross-border provisions are needed to guarantee a smooth functioning of value chains (Nunn, 2007; and Antras and Staiger, 2011), then bilateral agreements may turn out to be more feasible and hence preferable[[47]](#footnote-47). This reasoning is in line with the theoretical model of Antras and Staiger (2011) which looks at *offshoring* and FTAs in the presence of incomplete contract. It identifies a hold-up problem, associated with market failures, that leads to an inefficient level of economic activity (offshoring) between countries. Their model suggests that flows of vertically specialised trade could be curtailed by the lack of appropriate regulatory frameworks or enforcement mechanism[[48]](#footnote-48). They argue that “As the prevalence of offshoring rises, effective trade agreements and the institutions that support them will have to evolve, [...], towards a collection of more-individualized agreements that can better reflect member-specific idiosyncratic needs” (Antras and Staiger 2011:p4). This suggests that there might, in principle, be a link between regulatory frameworks and the demand for FTAs. ‘Good’ regulations can promote the contestability of markets and ensure tighter controls in the enforceability of contracts hence reducing the incidence of hold-ups in trade. If appropriate enforcement mechanisms are needed for buyers and sellers to conduct their business, then good institutions, or indeed governance mechanisms, could play a trade enhancing role.

Regulatory frameworks are then likely to become increasingly important in mediating international economic activity. This is because modern international production sequences demand greater coordinating efforts. As production is ‘chopped’ across many different origins, the incidence of a failure of one segment of production along a value chain rises. This may jeopardise the functioning of the entire value chain. Hence an appropriate regulatory framework that enforces contractual obligations and allows for private sector dispute settlement may provide some of the necessary conditions for the spread of this type of international production[[49]](#footnote-49). The work of Orefice and Rocha (2011) corroborates a link between the regulatory environment and intermediate goods trade. They suggest that this type of trade not only motivates the conclusion of ‘deeper’ agreements but is also positively affected by the presence of deeper provisions. This implies that countries may seek to engage in deeper FTAs in an effort to bolster value chain activity through regulatory reform and hence that current measures of governance may affect the desirability of engaging in new trade agreements.

### The Spread of Production and Interdependence

In Baldwin’s (1993) domino theory of regionalism, third country FTAs cause trade diversion which negatively impacts on domestic firms through a loss in export market shares. This incites domestic firms to lobby harder for further bilateral liberalisation in an effort to retain these markets or to gain access to new export markets. A similar form of interdependence may also arise from the spread of production.

Neighbouring regionalism may jeopardise the location of a domestic segment of production within an international value chain. This may, in turn, bring about lobbying incentives towards joining new or expanding FTAs. If Mexico is currently exporting intermediate inputs to Korea, then a China-Korea agreement may threaten Mexico’s link with Korea. This agreement may lead to ‘source-switching’ where Korea begins importing intermediates from China rather than from Mexico. This implies that Mexico’s support for an FTA with Korea may be affected by Korea’s patterns of regionalism and influenced through value chain activity.

### Testable Hypotheses

The analysis presented in this section suggests the presence of three channels through which the changing nature of trade can impact the desirability of engaging in an FTA. These give rise to three testable hypotheses. The first is that greater degrees of vertical specialisation should lead to a higher likelihood of a trade agreement being concluded. The second is that the spread of production should give rise to interdependence effects which affect the probability that countries engage in new trade agreements. The third then suggests that regulatory quality should affect the desirability of engaging in an FTA. If the changing nature of trade is shaping new agreements, then the inclusion of variables that capture these factors should serve explain new patterns of regionalism.

## New Determinants For New FTAs

This section details the data used in looking at the new determinants of new FTAs. A different indicator is associated to each new channel through which the changing nature of trade has been identified to impact on the formation of FTAs. Hence changes in political economy conditions are identified through measures of vertically specialised trade; the role of regulatory frameworks is captured through indicators of governance; and interdependence effects are calculated using a vertically specialised weighted measure of neighbouring agreements. In the empirical section, a unidirectional unit of observation is used instead of one that identifies dyadic observations. The choice of such a unit of observation does not alter the results obtained and is favoured because it facilitates the interpretation of these. In particular, using unidirectional observations allows one to focus on both dyadic characteristics as well as individual country observations, such as the degree of vertically specialised trade of a country, without altering the results of the estimation[[50]](#footnote-50).

In looking at the changing determinants of FTAs two separate samples of countries will be used. A larger sample, of 140 countries for the period 1960 to 2006, will be called upon to ascertain how the ‘traditional’ determinants of FTAs change across the different waves of regionalism. However, in looking at how the changing nature of trade affects the formation of new trade agreements a smaller sample is used due to constraints in the calculation of measures of vertically specialised trade. Although this reduced sample is composed of 39 countries, for the period 1995-2008, it still captures 80% of world trade in 2008[[51]](#footnote-51).

### Traditional determinants of FTAs and Vertical Specialisation

The theoretical findings of the early models of Krugman (1991a and 1991b), Frankel et al. (1995) and Frankel (1997) did not receive a more formal empirical treatment until Baier and Bergstrand (2004) - henceforth BB2004. Using a qualitative choice model they find that the likelihood of an FTA is higher between partners; that are close in distance but remote from the rest of the world; that share a greater similarity in their GDPs; and that are more dissimilar in their factor endowments with respect to each other but more similar with respect to the rest of the world. These ‘*traditional*’ determinants of FTAs have been embraced by the empirical literature and constitute the benchmark model for investigating the formation of FTAs[[52]](#footnote-52). The implicit idea behind these models is that trade enhancing characteristics, or the potential thereof, should help predict what countries will find it desirable to engage in an agreement.

Regionalism derives its name from the fact that preferential partners tend to be neighbouring countries. BB2004 capture this by introducing two distance based measures into their FTA formation equation. These serve the purpose of capturing trade costs in the spirit of the theoretical models of Krugman (1991a, 1991b) and Frankel et al. (1995). Higher transport costs are associated with lower trading volumes and hence a lower likelihood of an FTA being formed. BB2004 use the natural logarithm of the inverse of distance between two countries suggesting that ‘NATURAL’ trading partners, i.e. those that are closer, will be more likely to engage in an agreement. The second distance based indicator is a measure of *remoteness* (REMOTE) which identifies the distance between a country and its closest trading partners:



(1)

CONT is a dummy variable that is equal to 1 when countries are located in the same continent. REMOTE then identifies the simple average of country i’s distance from all trading partners except j that are located in the same continent. The intuition behind this measure is that a pair of countries, with more remote third country partners, is expected to trade more with each other because of the presence of higher trade costs with respect to other trading alternatives. Hence Australia and New Zealand’s trade is not only a product of the distance between these, but also the distance with respect to the closest third country partners. The remoteness measure is reminiscent of the ‘multilateral resistance’ term introduced in Anderson and Van Wincoop (2003). Even though it is calculated in terms of distance rather than price, it serves capture a similar concept[[53]](#footnote-53). The variable is expected to have a positive coefficient capturing the fact that the welfare gains from an FTA between two countries should be increasing as these are more remote from the rest of the world (Hypothesis 2 in BB2004)[[54]](#footnote-54).

The other measures introduced in BB2004’s ‘traditional’ determinants of FTAs are the economic characteristics that were discussed in section 2. Countries which are larger, in terms of their economic mass are more likely to engage in FTAs. Hence a measure of the sum of the log of their GDP’s (RGDP) is expected to yield a positive coefficient. However, countries that are more dissimilar in this economic mass, identified through the absolute difference in the log of their GDPs (RGDPsim), are expected to be less likely to engage in an FTA[[55]](#footnote-55). BB2004 used measures of capital labour ratios to control for the fact that agreements between partners that share larger differences in these ratios are more likely to deliver higher welfare gains (as predicted by traditional H-O models of trade). However Egger and Larch (2008) – Hereafter EL2008 - suggest that per capita GDPs can be used to capture these differences[[56]](#footnote-56). They include the absolute difference in the logs of the per capita GDPs (DGDPcap) and the square of these (SQDGDPcap), to capture non-linearities in this term, in their FTA formation equation. The expected sign of the coefficient of the former is positive whereas the latter is expected to have a negative coefficient (capturing these non-linearities)[[57]](#footnote-57). A final measure of the difference in the per capita GDPs of countries with respect to the rest of the world (DGDPcapROW) is added in an effort to account for BB2004’s notion that the probability of two countries engaging in an FTA is diminishing as the K-L ratios with respect to the world rise. This measure is computed using the following equation obtained from EL2008:



(2)

The idea that has permeated the discussion on the determinants of FTAs is that the degree of vertical specialisation should play a positive role in the formation of new agreements. This is because measures of vertically specialised trade can help identify changing political economy conditions. Several measures will be used for this purpose. The first is a fully bilateral measure of the value of imported intermediates that are part of a bilateral value chain (lnintimps\_BVSbil). It captures the value of the components imported from a particular partner that are then used to produce exports to that very same partner. This measure is calculated using the OECD IO tables and trade data from COMTRADE. A discussion on how this measure is obtained, what it represents and the assumptions needed for its calculation can be found in Lopez-Gonzalez and Holmes (2011).

A measure of intermediate goods trade, where intermediates are identified using the BEC nomenclature (lnintimps\_BEC), will also be introduced in the estimations. This is to compare the results of this paper to the findings of Orefice and Rocha (2011). Finally, a measure of the global degree of vertical specialisation of a country, VSWLD, will be used. It is calculated following Hummels et al. (2001), it is their indicator of vertical specialisation. VSWLD captures the degree of global vertical specialisation, it is the share of total intermediate imports used, irrespective of their precedence, to produce total exports to all partners. It represents the international backward linkages of countries and is invariant across partners. It is used to identify the internal structure of the political economy forces within a country. Higher degrees of VSWLD should imply the presence of a greater amount of vertically specialised industries within a country and hence a greater lobbying mass in favour of liberalisation.

### Governance Structures

The presence of ‘appropriate’ governance structures within a country can, in principle, facilitate the flow of goods and ideas and is often associated with a more liberal trade stance (see Mansfield et al. 2000, 2002 and Mansfield et al. 2008)[[58]](#footnote-58).The link arises through more democratic governments placing a greater value on the well-being of its citizens and hence conducting a more liberal trade policy in an effort to bolster their consumer surplus[[59]](#footnote-59). However another link between governance and FTAs can arise from the recent theoretical literature on incomplete contracts and trade (Antras, 2003; Ornelas and Turner, 2008; and Antras and Staiger 2011). Antras and Staiger’s (2011) hold-ups occur when firms trade less than they normally would due to the existence of uncertainties about the quality of the counterparts they are engaging in a deal with. The possibility that these renege on their contractual obligations leads to an inefficient amount of economic activity taking place between countries. However, if such uncertainties can be reduced by the presence of appropriate governance mechanisms, then it is possible that these mitigate hold-up problems[[60]](#footnote-60). This may then suggest that countries with better institutions, or governance structures, should not only trade more, but also be more willing to engage in trade agreements.

However, the link between governance mechanisms and the formation of FTAs is likely to be rather complicated. Although, a priori, better governance structures are expected to be associated with a higher likelihood of an FTA, countries may also wish to engage in FTAs in an effort to redress shortfalls in regulatory quality. Hence lower measures, within certain acceptable levels, may provide countries with the opportunity of addressing shortfalls in governance through an FTA. An example of this arises from the Eastern European Enlargement where it is often argued that a large share of the benefits enlargement arose from binding regulatory frameworks to the provisions of the *acquis communautaire*. EU countries may have found it desirable to sign deeper agreements with Eastern European countries in an effort to bolster their regulatory provisions so as to engage in a wider fragmentation of production with these countries.

In an effort to capture the role of regulatory structures in the formation of FTAs, measures, from the World Bank’s Worldwide Governance Indicators, will be introduced into an FTA formation equation[[61]](#footnote-61). These are harmonised by country and year and range from -2.5 to 2.5. Higher values are associated with better governance structures[[62]](#footnote-62). Each indicator captures a different facet of governance:

* *Voice and Accountability (Voice\_acc)*: Captures freedom of speech, association and free media. This measure is the perceptions of the extent to which a country's citizens are able to participate in selecting their government.
* *Political Stability (Pol\_stab)*: measures the perceptions of the likelihood that a government will be destabilised or overthrown by unconstitutional or violent means.
* *Government Effectiveness (Gov\_eff)*: captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
* *Rule of Law (Rol):* captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
* *Control of Corruption (ctr\_corr):* captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
* *Regulatory Quality (Reg\_qual):* captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

As shown in Table 1, the measures of governance are highly correlated and hence their use, in the empirical section, needs to be approached with care. Introducing all measures into one single specification will cause multicollinearity which will lead to problems in the interpretation of the resulting coefficients[[63]](#footnote-63).

**Table 1: Correlation Coefficient of Governance Measures**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Ctr\_corr | Gov\_eff | Pol\_stab | RoL | Voice\_acc | reg\_qual |
| Ctr\_corr | 1 |  |  |  |  |  |
| Gov\_eff | 0.965 | 1 |  |  |  |  |
| Pol\_stab | 0.774 | 0.779 | 1 |  |  |  |
| RoL | 0.958 | 0.954 | 0.805 | 1 |  |  |
| Voice\_acc | 0.851 | 0.847 | 0.792 | 0.870 | 1 |  |
| reg\_qual | 0.896 | 0.904 | 0.764 | 0.908 | 0.832 | 1 |

In the empirical section, variations of these measures will be used to capture different links between regulatory frameworks and FTAs. First, the value of these will be introduced into an FTA formation model with the expectation that higher measures be associated with a higher likelihood of an FTA being formed. However, looking at dyadic characteristics, such as the minimum, the maximum, and the difference in these measures will also be instructive. If hold-ups are important, and can be mitigated by appropriate governance structures, then one could expect that the minimum governance measure, in a dyadic relationship, provides the binding condition for there to be an agreement. This is because the degree of the hold-up is likely to depend on the characteristics of the weakest member in a dyadic observation. This minimum measure may also help identify if countries are signing trade agreements in view of redressing shortfalls in regulatory frameworks as earlier suggested. However disentangling which effect dominates will be complicated. Wider differences in governance measures should also be associated with lower likelihoods of engaging in a trade agreement through similar channels. Both these stories would be consistent with Antras and Staiger’s (2011) work[[64]](#footnote-64).

Although these measures are expected to be determinants of FTAs, a word of caution, in their interpretation is advised. These are collated from many different sources and represent the sentiment, or perceptions, of the inhabitants of a country rather than being direct observations of the actual quality of governance. Furthermore, in interpreting the marginal effects, the truncation of these measures will need to be considered as will what constitutes a ‘relevant’ change in these[[65]](#footnote-65).

### Interdependence Effects

The importance of interdependence effects in the formation of FTAs, as predicted by Baldwin’s (1993) domino theory of regionalism, has recently been established. Egger and Larch (2008) were first to give this hypothesis an empirical backing. They showed that third party agreements play a positive role on the probability that countries engage in an agreement. Their empirical approach relies on a spatial econometric model in which a distance weighted FTA lag is introduced into Baier and Bergstrand’s (2004) original FTA formation model. Baldwin and Jaimovich (2010) then take a similar approach but propose a measure of FTA ‘contagion’ that is obtained from a weighted spatial lag that uses exports as weights rather than the distances used in Egger and Larch (2008). Both suggest that ‘other’ FTAs affect the probability of a country pair engaging in one of their own.

Baier et al. (2010) opt for a more traditional approach in looking at interdependence effects (rather than the aforementioned spatial models)[[66]](#footnote-66). They argue that interdependence can be subsumed into *Own FTA* and *Other FTA* effects[[67]](#footnote-67). The first type of interdependence captures changes in the incentives of countries to form new FTAs which are commensurate on the amount of FTAs they currently hold[[68]](#footnote-68). The second captures a similar effect to that investigated in the spatial models, namely the role of third country regionalism on FTA formation[[69]](#footnote-69).

Own-FTA effects can be captured using a variable that identifies the sum of a country’s existing FTAs with other countries (Baier et al. 2010). This variable is likely to capture two different effects. First, the costs of negotiating an additional FTA should be decreasing in the number of FTAs a country has already signed and hence this measure should have a positive impact on the probability of signing an additional agreement by capturing lower negotiating costs[[70]](#footnote-70). Secondly, a larger count of FTAs should also manifest the presence of political economy forces that are more inclined towards liberalisation[[71]](#footnote-71). This is akin to capturing Baldwin’s juggernaut effect where more liberal policies reduce the lobby powers of import competing firms and increase those of firms who favour liberalisation. However, in capturing these political economy forces, it is also possible that this measure is correlated with others that serve the same purpose such as the earlier explained VSWLD and hence the inclusion of these measures in the same estimation need be approached with caution[[72]](#footnote-72).

The other source of interdependence arises from domino forces or ‘other FTAs’. Baldwin and Jaimovich’s (2010) – henceforth BJ2010 – ‘contagion’ index can be used to capture such interdependence. The main idea here is that countries that are left out of expanding agreements can lose export shares in these as a result of trade diversion. This then induces them to sign trade agreements in an effort to re-direct their trade flows. BJ2010 create their contagion indicator using the following equation:



(3)

Where is the share of exports of country i to all partners (k) except j and FTA is equal to one for each agreement that country j has with partner’s that are not country i. The measure captures the importance of country j’s preferential partners weighted by country i’s exports to these. It is expected to have a positive influence on the likelihood of signing an FTA (BJ2010).



Similar forms of contagion may also arise from vertically specialised modes of production. Being excluded from an expanding agreement can jeopardise a domestic industry’s position within an international value chain. Hence third country regionalism can also lead to interdependence effects through its effects on value chain activity. In an effort to capture this, a VS contagion index (wbvsFTA) is created through a similar measure. The only difference arises from the use of a new share parameter. It identifies the importance of country j’s preferential partners for country i captured through the share that these markets occupy in country i’s bilateral value chain activity:



(4)

The inclusion of these contagion measures raise issues of endogeneity because trade shares are likely to be affected by changes in preferential status (BJ2010). To control for this issue, the above shares are calculated for the first year in the sample (1995) when no agreements are identified. This implies that these contagion measures only vary through country’s participation in FTAs.

Table 2 provides a summary of the indicators that will be used in the empirical section. It identifies; the name of the variables; a description of what these capture; the expected sign on the impact of the probability of the formation of a new FTA; and the source from which the measures are calculated/derived[[73]](#footnote-73).

**Table 2: Summary of Independent Variables for FTA formation model**

| **Variable** | **Description** | **expected sign** | **Source** |
| --- | --- | --- | --- |
| NATURAL | Inverse of the natural logarithm of the distance between two countries | (+) BB 2004 and EL 2008 | Calculated using CEPII |
| REMOTE | Distance between a country and its closest neighbouring partners (except j). Calculated using equation 1 | (+) BB 2004 and EL 2008 | Calculated using CEPII |
| RGDP | Sum of the log of the GDP of countries i and j. | (+) BB 2004 and EL 2008 | Calculated using WDI |
| RGDPsim | Absolute difference in the log of the GDP’s of countries i and j. | (+) BB 2004 and EL 2008 | Calculated using WDI |
| DGDPcap | Absolute difference in the log of the per capita GDP’s of i and j. | (+) BB 2004 and EL 2008 | Calculated using WDI |
| SQDGDPcap | Square of DGDPcap | (-) BB 2004 and EL 2008 | Calculated using WDI |
| DGDPcapROW | Differences in the per capita GDP’s of country i and j with respect to the rest of the world. Equation 2. | (-) BB 2004 and EL 2008 | Calculated using WDI |
| Governance measures | Voice\_acc, Rol, Pol\_stab, Gov\_eff, Reg\_qual, Ctr\_corr | (+)AS 2011 | WGI |
| MinGov\* | MinGov\* is the minimum measure of the above governance indicators in a dyadic observation. | (+)AS 2011 | WGI |
| MaxGov\* | MaxGov\* is the maximum measure of the governance indicators in a dyadic observation. | (+)AS 2011 | WGI |
| DiffGov\* | DiffGov\* is the absolute difference between the reporter and partner measures of governance. | (-)AS 2011 | WGI |
| IMPORTS | Natural logarithm of imports | (+) Magee (2003) | COMTRADE |
| INTIMPS\_BEC | Natural logarithm of intermediate imports used for any purpose in the economy. Identified by way of the BEC nomenclature | (+) Orefice and Rocha (2011) | COMTRADE |
| INTIMPS\_BVS | Natural logarithm of the intermediate imports that are part of a fully bilateral value chain. See Lopez-Gonzalez (2012). | (+) | # COMTRADE and OECD STAN database |
| VSWLD | Degree of global vertical specialisation. Captures the structure of trade by reporting the share of total intermediate imports (irrespective of origin) that are part of a value chain, as a proportion of total exports | (+) | # COMTRADE and OECD STAN database |
| countFTA | Sum of FTAs a country has in a given year | (+) | Calculated using CEPII |
| wexpFTA | Measure of contagion with export weights in 1995. See equation (3). Identifies the importance of country j’s preferential partners in country i’s exports | (+) BJ2010 | Calculated using CEPII + Comtrade |
| wbvsFTA | Measure of contagion with VS weights from 1995. See equation (4). Identifies the importance of country j’s preferential partners in country i’s exports of intermediate goods used in bilateral value chain activity. | (+) | Calculated using CEPII + OECD STAN + Comtrade |

## 

## Empirical Framework

In capturing the impact of vertical specialisation on the probability that two countries engage in an FTA one will be confronted with two separate issues of *endogeneity*. The first arises from *unobserved heterogeneity* whereas the second is caused by *simultaneity*[[74]](#footnote-74). Unobserved heterogeneity occurs because of the presence of unobserved variables (to the econometrician) simultaneously affecting both the probability of countries engaging in an FTA and also the levels of vertical specialisation between these[[75]](#footnote-75). These unobserved parameters are captured by the error term (which will no longer exhibit its desired i.i.d. properties) and cause biases in the estimation of the coefficients of interest. Baier et al. (2007:p26) remark that “the inclusion of bilateral trade as a RHS variable [..] is likely to result in inconsistent coefficient estimates”[[76]](#footnote-76). Simultaneity is also likely to be problematic. It occurs through the impact that FTAs have on current trade flows. Mitigating this bias can be done through the use of pre-agreement rather than current trade flows, however providing controls for unobserved heterogeneity may be more complicated. Understanding the nature of these biases is crucial in providing solutions to the problems they cause in the estimation.

Lopez-Gonzalez (2012) suggests that there might be cause for concern about the presence of endogeneity by showing that current levels of vertically specialised trade were affected by the presence of future trade agreements. Hence countries with characteristics associated with higher levels of vertically specialised trade appeared to be selecting into FTAs[[77]](#footnote-77). If these characteristics are unobserved, then biases in the estimation of an FTA formation equation will appear[[78]](#footnote-78). These biases can be dealt with using cross-sectional and panel data techniques and this section discusses the merits and pitfalls of these approaches in estimating an FTA formation model using trade based measures of vertical specialisation.

### Cross-sectional Models

The traditional empirical framework used to capture the determinants of FTAs is the binary response model. The probability of a positive outcome (FTA=1), conditional on a set of covariates (x), is determined by the function P(FTA=1|x)= G(xβ). G(.) represents the cumulative density function (cdf) that ensures that predicted values lie within the unit interval and β identifies a set of coefficients. A positive outcome is occurs when FTA= 1[FTA\*>0] where FTA\* is a latent unobserved variable that captures the minimum utility that each country is likely to obtain from signing an agreement (i.e. FTA\* = min(ΔUi,ΔUj)). This empirical approach to the formation of FTAs, first proposed by Baier and Bergstrand (2004), is valid provided that strictly exogenous explanatory variables are used. In this respect, BB2004 rely on distance and income measures which should satisfy this criterion[[79]](#footnote-79). However the introduction of measures of vertical specialisation raises concerns related to unobserved heterogeneity. The following ‘true’ model of FTA formation can help elucidate the nature of the problem:



(5)

The probability of two countries (i,j) engaging in an FTA is determined by; a set of covariates Xi,j which include the degree of VS between these; and an error term that is composed of an unobserved element (qi,j) and an iid normally distributed error term (εi,j). Because the unobserved element is likely to be correlated with both the probability that two countries form an FTA (dependent variable) and the levels of VS between these, the model cannot be estimated using traditional techniques because biases in the coefficients of interest will arise. Estimating the probability model then requires using a method that generates exogenous variation in the independent VS variable.

This can be achieved, in cross-sectional models, either through an Instrumental Variable (IV) approach or a first difference (FD) estimator. Magee (2003) opts for the former by treating trade flows and FTAs as endogenous processes. Instrumenting for each in a first step equation, he uses the predicted values thus obtained to estimate their impact on each other in a second step. Looking at the role of VS on the probability that two countries engage in an agreement can be achieved through a similar two-step procedure:



(6)



(7)

A first step gravity model for vertically specialised trade (6) is estimated using a set of valid instruments and the predicted values of this first-step,, are introduced in a second step FTA formation equation (7)[[80]](#footnote-80). In the first step, Z, identifies a set of explanatory variables that include instruments that meet the necessary validity criteria. The first one is that the fitted values from the first step must be uncorrelated with the unobserved element of the error term υi,j in (7) so that COV(, υi,j)=0. Because this term (υi,j) is unobserved, it is hard to determine whether this condition is met in these types of models. The second validity test requires the instruments to be as correlated as possible with the measure of VS[[81]](#footnote-81). Proving the validity of instruments tends to be complicated and often boils down to providing a convincing argument[[82]](#footnote-82). Baier and Bergstrand (2007) argue that valid instruments, in this type of estimation, are notoriously hard to come by[[83]](#footnote-83). Hence alternative methods for estimating FTA formation equations will also need to be pursued.



One such alternative approach is to estimate these models using a first difference (FD) estimator. If the ‘true’ model of FTA formation follows equation (5), and one can draw on two time periods (T=2), then it is possible to apply a first difference approach to eliminate the problematic unobserved parameter (qi,j) so that the following model is estimated:



(8)

The dependent variable takes the value 1 when a country ‘switches’ into an agreement from period 0 to period 1 and thus identifies new agreements within the sample[[84]](#footnote-84). The α0 constant captures the time trend in the data (i.e. the difference in the intercept in period 0 and period 1). By virtue of the assumed time invariant nature of the unobservable variable, the term (q i,j,1- q i,j,0) in the above expression will be equal to zero and hence disappear from the estimation. If δ >0 then this implies a positive effect of the *change* in VS on the probability that a country *switches* into an agreement. The above model can be estimated using non-linear probability models (probit or logit) to make sure that the predicted values lie within the unit interval, however if the source for unobserved heterogeneity arises from factors that change in time, then such a specification may not resolve the endogeneity problem and also deliver biased estimates.

In estimating this model one should also bear in mind that the period during which the differences are taken is going to be important. If one takes differences between the first period and the last period of the sample then the FD model might remain biased due to simultaneity. If flows of vertically specialised trade are positively affected by FTAs, then changes in flows will be endogenous to the presence of an FTA. This suggests that pre agreement changes in flows should be used to predict future changes in FTA status.

### Panel Data approaches

Panel data settings generally provide convenient solutions for dealing with unobserved heterogeneity as shown in Baier and Bergstrand (20070 and Lopez-Gonzalez (2012). Using an informed choice of FE can often eradicate the biases that this condition afflicts on the coefficients of interest. However the binary nature of the FTA dependent variable requires using non-linear estimation techniques which introduce complications in the estimation procedure on account of the ‘incidental parameters problem’ (see Wooldridge, 2002 Chapter 15 p 484; and Greene, 2010 Chapter 9)[[85]](#footnote-85). Binary dependent variable models may yield severe biases when using the FE estimator. The alternative of using a random effects (RE) model is also unsatisfactory because of the implicit assumption of no correlation between the unobserved effects and the regressors. If the underlying hypothesis posits that the nature of the endogeneity problem arises from the unobservables driving *both* the level of VS and also the incentives to form a trade agreement, then the RE model assumptions is generally, but as we shall see, not always, inadequate. Although there is no widely accepted method for estimating binary models with FE using panel data, several ‘fixes’ have been proposed in the literature.

The first is similar to the IV approach that was earlier presented (Equations 6 and 7) but it is applied in the context of a panel estimation. Manger (2009) looks at the impact of vertical intra industry trade[[86]](#footnote-86) on the probability of two countries engaging in an FTA using such a two step procedure[[87]](#footnote-87). The first step consists of estimating a gravity model and the second step uses the predicted values of this first step to look at an FTA formation equation. One can apply this method to look at the role of VS in the formation of FTAs[[88]](#footnote-88). The idea here is that using predicted values of VS rather than actual values means that the unexplained part of this variable, that is likely to be correlated with the unobservables, is removed and hence exogenous variation in the VS measure has been accomplished. This implies that it can be introduced into a second step FTA formation equation[[89]](#footnote-89).

Wooldridge (2002) proposes a different solution for estimating binary models with fixed effects. He suggests that a Mundlak-Chamberlain approach can be applied[[90]](#footnote-90). This can be accomplished by estimating an RE model with added observation averaged independent variables which act as pseudo-fixed-effects[[91]](#footnote-91). Consider a variant of equation (5) that incorporates a time dimension and where the VS term enters through the set of explanatory variables, xi,j,t, and is correlated with the time invariant term qi,j:



(9)

It is possible to condition the structure of qi,j using observation averages so that:



(10)

The unobserved component of the FTA equation, qi,j, is conditioned as a function of , which identifies the average values of the regressors over time and an error term bi,j that is assumed to be uncorrelated with . Wooldridge (2002) argues that “Adding [ as a set of controls for unobserved heterogeneity is very intuitive: we are estimating the effect of changing [Xi,j,t]but holding the time average fixed”.



## Results

The objective of this paper is to investigate how and if the changing nature of trade affects the formation of FTAs. Three new channels through which this might occur have been identified. One is through changes in the political economy dynamics of liberalisation. Another is through a larger role for institutional participation captured by way of governance measures; the last is through the emergence of interdependence effects arising from the spread of production across national borders. Before turning to each of these, a closer analysis of how the traditional determinants of FTAs fare in explaining the participation of countries across the different waves of regionalism is warranted. If the changing nature of trade is important, then one might expect changes in the coefficients of the traditional determinants of FTAs. Furthermore, if there are new reasons for engaging in new FTAs then one might also expect that these traditional determinants show a diminishing explanatory power in predicting the countries involved in the different waves or regionalism. Once the need for looking at new determinants of FTAs has been established, a more focused analysis of the new determinants of new agreements signed between 1995 and 2008 will be carried out on a subsample of countries using, first, cross-sectional models and then panel techniques[[92]](#footnote-92).

### Changes in the Traditional Determinants of FTAs

The preliminary evidence presented in section 2 pointed to perceivable differences in the characteristics of new preferential partners with respect to earlier waves. It suggested that the countries involved in the latest wave of regionalism tended to be less distant and shared lower similarities in their capital-labour ratios (as proxied by GDP per capita) than during earlier waves. If there are changes in the determining features of FTAs across the different waves, then one should be able to capture these by re-estimating the traditional FTA formation equations (BB2004). To this end, the following cross-sectional logit model is estimated across the different waves of regionalism[[93]](#footnote-93):



(11)

The results from these estimations, for a sample of 140 countries, are presented in Table 3. The dependent variable in the first column is equal to one if an FTA has been concluded by the year 2006 so that this estimation captures the traditional determinants of *any* agreement as in BB2004. The final three columns of the table show the results of estimating equation (11) for different dependent variables that capture the formation of new agreements during each identified wave of regionalism. Hence for Column (2) the dependent variable is equal to one *only* if a new agreement is signed during the identified lapse of the wave (i.e. 1958-1985). The dependent variable in column (3) is then equal to one if a dyad signed a new agreement during the second wave and so forth[[94]](#footnote-94). A different base year is used for each estimation so that; the first wave uses 1970’s economic characteristics; the second wave has a base year of 1985; and the third wave is investigated using the characteristics of countries in 1995[[95]](#footnote-95).

Column (1) confirms the results obtained by BB2004 and EL2008[[96]](#footnote-96). It shows that the probability of two countries engaging in an FTA is increasing in the degree of proximity between these (NATURAL) and remoteness (REMOTE) with respect to third countries. The combined economic mass (RGDP) and the similarity in GDP’s (RGDPsim) also have a positive impact on the likelihood of an FTA as do larger differences in capital-labour ratios (DGDPcap). This last variable enters the specification non-linearly as seen by the significance of the square of this term (SQDGDPcap). A comparison of the coefficient estimates across the different waves gives econometric support to the stylised facts observed in section 2. The changing role of distance appears to be captured by changes in the coefficient estimates of the distance based variables. In particular, the insignificance of the REMOTE measure in the final column may be pointing to differences in the geographic spread of new preferential partners during the latest wave of regionalism, or in other words to the emergence of more distant agreements[[97]](#footnote-97). In addition, the increase in the coefficient estimates of the DGDPCAP measure seen for the latest wave also lends itself to the notion that new preferential partners are increasingly more dissimilar in their capital-labour ratios.

Another revealing result lies in the decline in the predictive powers of the estimations across the different waves. Whereas the independent variables explain 43% of the full sample variance, they only explain 31% of the variance during the latest wave of regionalism[[98]](#footnote-98). Hence, although these determinants remain important, their predictive powers fall considerably in explaining the latest wave of regionalism. This is also highlighted when using another measure of ‘goodness-of-fit’ that tracks the percentage of correctly predicted FTAs conditional on the outcome (BB2004)[[99]](#footnote-99). Here the full sample model successfully predicts 43% of the agreements that are in place throughout the entire sample (column 1). However this predictive power is reduced to 11% for new agreements signed during the third wave (i.e. 91 of the 831 agreements)[[100]](#footnote-100). These results make a case for considering the waves of regionalism independently and may be suggestive of changes in the determinants of new FTAs[[101]](#footnote-101). This is the focus of the remainder of this study.

**Table 3: Determinants of FTAs across the different waves of regionalism – Full Sample**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | (1) | (2) | (3) | (4) |
| VARIABLES | Expected Signs | FTA in 2006 | FTA: **first wave** 1960-1984 | FTA: **Second wave** 1985-1995 | FTA: **Third wave** 1995-2006 |
| (1970 values) | (1970 values) | (1985 values) | (1995 values) |
| NATURAL | (+) | 1.936\*\*\* | 1.399\*\*\* | 1.662\*\*\* | 1.749\*\*\* |
|  |  | (0.0578) | (0.0714) | (0.0708) | (0.0648) |
| REMOTE | (+) | 0.0573\*\*\* | 0.134\*\*\* | 0.249\*\*\* | -0.00542 |
|  |  | (0.00726) | (0.0183) | (0.0179) | (0.00907) |
| RGDP | (+) | 0.219\*\*\* | 0.212\*\*\* | 0.218\*\*\* | 0.251\*\*\* |
|  |  | (0.0111) | (0.0223) | (0.0153) | (0.0140) |
| RGDPsim | (+) | 0.114\*\*\* | -0.0730 | 0.400\*\*\* | 0.145\*\*\* |
|  |  | (0.0257) | (0.0446) | (0.0508) | (0.0311) |
| DGDPCAP | (+) | 0.441\*\*\* | -0.385\* | 0.706\*\*\* | 1.012\*\*\* |
|  |  | (0.131) | (0.230) | (0.210) | (0.136) |
| SQDGDPCAP | (-) | -0.223\*\*\* | -0.0183 | -0.369\*\*\* | -0.263\*\*\* |
|  |  | (0.0443) | (0.0737) | (0.0720) | (0.0330) |
| DGDPcapROW | (-) | -0.638\*\*\* | -0.0943 | 0.413\*\*\* | -0.555\*\*\* |
|  |  | (0.0733) | (0.107) | (0.0809) | (0.0765) |
| Constant |  | 10.93\*\*\* | 3.394\*\*\* | 4.326\*\*\* | 7.186\*\*\* |
|  |  | (0.541) | (0.695) | (0.665) | (0.580) |
| Observations |  | 19,460 | 19,460 | 18,957 | 18,455 |
| r2\_p |  | 0.439 | 0.385 | 0.496 | 0.308 |
| Correctly Predicted p(FTA)=FTA |  | 92.78% | 98.28% | 96.81% | 95.23% |
| Correctly Predicted FTA=1\* |  | 43.29%  (781 out of 1804) | 15.93%  (58 out of 364) | 27.3%  (175 out of 641) | 10.95%  (91 out of 831) |
| 97.84% | 99.85% | 99.24% | 99.21% |
| Correctly predicted FTA=0 |  | 19,460 | 19,460 | 18,957 | 18,455 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Values are for the different base years. Column (1): 1970; Wave 1: 1970; Wave 2: 1985; Wave 3, 1995.

\*Sum of new agreements across different waves is larger than that of agreements in 2006. This reflects agreements that expired

### Determinants of New FTAs: Governance

One of the hypotheses put forward in this paper argues that the rising complexity of international economic transactions should lead to a greater demand for ‘appropriate’ regulatory frameworks. Measures of governance may help identify the scope for hold-ups and hence be determinants of the desirability of engaging in FTAs. A priori, countries with ‘better’ governance structures are expected to experience a lower incidence of hold-ups and hence larger trade volumes making the conclusion of an FTA more desirable. However, it is also possible that larger hold-ups motivate the creation of FTAs in an effort to redress these through a harmonisation of regulatory frameworks. Looking at the role of measures of governance in the formation of new FTAs is approached through the introduction of these measures into a ‘traditional’ FTA formation equation[[102]](#footnote-102).

The first column of Table 4 shows the results obtained from estimating BB2004’s traditional FTA formation model for a cross section of countries in the year 2008 using a reduced sample of 39 countries[[103]](#footnote-103). This benchmarking exercise reveals that the ‘traditional’ determinants of FTAs fare better at predicting new FTAs in the new subsample of countries than they were seen to be in the larger sample used to produce the results reported in Table 3[[104]](#footnote-104). The model now successfully predicts 54% of new agreements signed. The remainder of the columns introduce the *levels* of the different governance measures. The positive sign in the coefficients of these measures gives supporting evidence to the initial hypothesis - ‘better run’ countries are more likely to engage in FTAs. The results also suggest that the measure that tracks regulatory quality (REG\_QUAL) explains the largest amount of the variance when compared to the other measures. Recalling that this measure captures the ability of governments in formulating and implementing policies that promote private sector development reinforces the claim that regulatory frameworks are important as originally suggested.

**Table 4: Determinants of FTAs – Measures of Governance**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| NATURAL | 0.817\*\*\* | 0.817\*\*\* | 0.863\*\*\* | 0.930\*\*\* | 0.909\*\*\* | 0.879\*\*\* | 0.923\*\*\* | |
|  | (0.139) | (0.139) | (0.141) | (0.150) | (0.145) | (0.144) | (0.148) | |
| REMOTE | 0.174\*\*\* | 0.174\*\*\* | 0.180\*\*\* | 0.183\*\*\* | 0.180\*\*\* | 0.184\*\*\* | 0.189\*\*\* | |
|  | (0.0311) | (0.0311) | (0.0314) | (0.0317) | (0.0319) | (0.0323) | (0.0324) | |
| RGDP | -0.224\*\*\* | -0.224\*\*\* | -0.217\*\*\* | -0.208\*\*\* | -0.211\*\*\* | -0.217\*\*\* | -0.212\*\*\* | |
|  | (0.0515) | (0.0514) | (0.0532) | (0.0531) | (0.0538) | (0.0544) | (0.0549) | |
| RGDPsim | 0.0786 | 0.0786 | 0.128 | 0.122 | 0.112 | 0.128 | 0.159\* | |
|  | (0.0879) | (0.0892) | (0.0902) | (0.0920) | (0.0905) | (0.0914) | (0.0929) | |
| DGDPCAP | 1.344\*\*\* | 1.344\*\*\* | 1.477\*\*\* | 1.518\*\*\* | 1.468\*\*\* | 1.512\*\*\* | 1.561\*\*\* | |
|  | (0.365) | (0.365) | (0.377) | (0.376) | (0.383) | (0.386) | (0.388) | |
| SQDGDPCAP | -0.312\*\*\* | -0.312\*\*\* | -0.335\*\*\* | -0.350\*\*\* | -0.329\*\*\* | -0.339\*\*\* | -0.352\*\*\* | |
|  | (0.116) | (0.116) | (0.123) | (0.123) | (0.127) | (0.128) | (0.129) | |
| DGDPcapROW | -2.000\*\*\* | -2.000\*\*\* | -2.101\*\*\* | -2.016\*\*\* | -2.181\*\*\* | -2.142\*\*\* | -2.042\*\*\* | |
|  | (0.316) | (0.317) | (0.353) | (0.360) | (0.371) | (0.371) | (0.376) | |
| POL\_STAB |  | -5.37e-05 |  |  |  |  |  | |
|  |  | (0.129) |  |  |  |  |  | |
| ROL |  |  | 0.430\*\*\* |  |  |  |  | |
|  |  |  | (0.106) |  |  |  |  | |
| VOICE\_ACC |  |  |  | 0.695\*\*\* |  |  |  | |
|  |  |  |  | (0.156) |  |  |  | |
| CTR\_CORR |  |  |  |  | 0.470\*\*\* |  |  | |
|  |  |  |  |  | (0.0934) |  |  | |
| GOV\_EFF |  |  |  |  |  | 0.700\*\*\* |  | |
|  |  |  |  |  |  | (0.129) |  | |
| REG\_QUAL |  |  |  |  |  |  | 0.868\*\*\* | |
|  |  |  |  |  |  |  | (0.124) | |
| Constant | 19.25\*\*\* | 19.25\*\*\* | 19.01\*\*\* | 18.76\*\*\* | 19.09\*\*\* | 18.81\*\*\* | 18.64\*\*\* | |
|  | (2.875) | (2.875) | (2.941) | (2.956) | (2.970) | (2.988) | (3.008) | |
| Observations | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | |
| r2\_p | 0.350 | 0.350 | 0.364 | 0.369 | 0.369 | 0.371 | 0.384 | |
| Correctly Predicted p(FTA)=FTA | 81.5% | 81.5% | 81.4% | 81.2% | 81.4% | 81.7% | 81.5% | |
| Correctly Predicted FTA=1 | 54.0% | 54.0% | 54.3% | 54.6% | 53.4% | 55.5% | 55.5% | |
| Correctly predicted FTA=0 | 93.2% | 93.2% | 92.9% | 92.5% | 93.3% | 92.8% | 92.5% | |
| Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 | | | | | | | |

Dyadic variations in these measures could also be important in determining FTA status. This is because, for the successful completion of an FTA, both negotiating partners need to ratify the agreement which suggests that their combined characteristics might be determining. Consistent with an interpretation of Antras and Staiger’s (2011) paper would be that it is the minimum value of these measures which is binding. Or, in other words, that the degree of hold-ups is determined by the degree of regulatory quality of the weakest member in a dyadic relationship. Differences in governance measures may also be important where wider discrepancies in regulatory frameworks between countries should lead to lower levels of offshoring and hence a lower demand for FTAs.

Table 5 looks at the role of different dyadic measures of governance on the precision of the FTA formation equation[[105]](#footnote-105). The first panel uses the minimum value of the governance measure in a dyadic observation whilst the second and third columns show the maximum and the difference in these respectively. The results support the idea that it is the minimum measure that is most influential in determining the formation of new FTAs. This can be seen by comparing the predictive power of the models in panel 1 against those of the remaining columns of Table 5. Again, the measure of regulatory quality appears to act as the ‘best’ predictor of FTAs when compared to the other measures of governance. In this format its inclusion increases the predictive powers of the FTA formation equation to a successful prediction of 66% of new agreements. This is to be contrasted against the benchmark model that correctly predicted 54% of agreements (column 1 of Table 4). One other possible interpretation for the positive coefficient found in this variable is that it is low measures of regulatory quality, in a dyadic observation, that motivate countries to sign new trade agreement. Or that countries may wish to engage in FTAs so as to redress shortfalls in regulatory quality. This interpretation is consistent with the results presented, however providing full econometric evidence of this effect by isolating it from other drivers might be tricky and require further work (see Appendix A3.4 for a discussion and some attempts at incorporating non-linear effects of these measures on the likelihood of an FTA being formed[[106]](#footnote-106)).

The results presented in the second panel then reveal that, although the maximum values of the governance measures in a dyadic relationship are significant, they add little explanatory power to the FTA formation equations. Turning then to the differences in these measures, in the final panel, shows support to the initial predictions suggesting that FTAs are less likely between countries that exhibit wide differences in governance[[107]](#footnote-107).

**Table 5: Determinants of FTAs – Measures of Governance, min, max and diff**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1)  MINS | | | (2)  MAX | | | (3)  DIFF | | |
|  | Coeff | Ps- R2 | Pred | Coeff | Ps- R2 | Pred | Coeff | P- R2 | Pred |
| POL\_STAB | -0.322\*\* | 0.353 | 55.2% | 0.612\*\*\* | 0.356 | 53.7% | 0.742\*\*\* | 0.365 | 57.1% |
| (0.151) |  |  | (0.218) |  |  | (0.164) |  |  |
| ROL | 1.126\*\*\* | 0.398 | 62.0% | 0.787\*\*\* | 0.366 | 51.5% | -0.761\*\*\* | 0.367 | 58.3% |
| (0.167) |  |  | (0.175) |  |  | (0.165) |  |  |
| VOICE\_ACC | 1.774\*\*\* | 0.413 | 62.6% | 1.591\*\*\* | 0.372 | 50.3% | -1.195\*\*\* | 0.380 | 58.3% |
| (0.375) |  |  | (0.322) |  |  | (0.253) |  |  |
| CTR\_CORR | 1.897\*\*\* | 0.446 | 63.8% | 0.493\*\*\* | 0.362 | 51.5% | -0.763\*\*\* | 0.373 | 60.1% |
| (0.257) |  |  | (0.119) |  |  | (0.132) |  |  |
| GOV\_EFF | 2.412\*\*\* | 0.450 | 64.4% | 0.819\*\*\* | 0.362 | 52.8% | -1.865\*\*\* | 0.405 | 65.0% |
| (0.305) |  |  | (0.197) |  |  | (0.231) |  |  |
| REG\_QUAL | 2.852\*\*\* | 0.501 | 66.3% | 1.091\*\*\* | 0.367 | 53.4% | -2.400\*\*\* | 0.458 | 65.0% |
| (0.368) |  |  | (0.236) |  |  | (0.248) |  |  |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

These results suggest that governance measures are important in determining the likelihood of a new agreement being formed and hence that their omission in subsequent estimations may lead to omitted variable biases. However, because the collective use of these introduces elements of multicollinearity, in subsequent estimations, only the measure that explains the largest variance in the probability of an FTA will be included. This is the minimum measure of regulatory quality.

### Determinants of New FTAs: Vertical Specialisation

Table 6 shows the results from estimating an augmented FTA formation model using various measures of trade and vertical specialisation for the year 2008. The first column now becomes the new baseline model. It includes the traditional determinants of FTAs (BB2004) in conjunction with the minimum measure of regulatory quality. The three columns that follow then capture the role of various trade measures on the likelihood of countries forming a new FTA. Column (2) introduces the log of the value of total imports (IMPORTS); column (3) the log of the value of intermediate imports as identified by way of the BEC nomenclature (INT\_IMPS\_BEC); and column (4) the log of the value of bilateral intermediate imports that are part of a bilateral value chain (INT\_IMPS\_\_BVS)[[108]](#footnote-108). These measures are seen to enter the FTA formation equation with a positive coefficient so that they are associated with a positive impact on the likelihood of the successful conclusion of a new FTA. Comparing the coefficients of these trade measures also shows that the largest impact, in terms of the size of the coefficient, is delivered by the BEC measure of intermediate imports[[109]](#footnote-109). However, the inclusion of the bilateral measure of vertically specialised trade results in a higher prediction of successful outcomes.

In column (5), a measure of the *structure* of trade is introduced through the minVSWLD indicator. The positive coefficient on this measure suggests that countries that are more globally vertically specialised are more likely to engage in a trade agreements. This indicator serves the purpose of capturing the political economy dynamics within a country. Higher measures are associated with a larger presence of a relative lobbying mass in favour of liberalisation. The minimum value of this indicator is used herein to reflect the fact that *both* countries have to have a larger lobbying mass in favour of liberalisation for the successful conclusion of an agreement[[110]](#footnote-110). Column (7) then adds the measure of the value intermediate imports which are part of a bilateral value chain to this specification. Again, further support to the positive role of vertically specialised trade on the formation of new trade agreements is identified[[111]](#footnote-111).

**Table 6: Determinants of FTAs – Trade Measures**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| NATURAL | 1.482\*\*\* | 1.317\*\*\* | 1.304\*\*\* | 1.215\*\*\* | 1.528\*\*\* | 1.322\*\*\* |
|  | (0.195) | (0.217) | (0.212) | (0.218) | (0.205) | (0.231) |
| REMOTE | 0.195\*\*\* | 0.184\*\*\* | 0.177\*\*\* | 0.178\*\*\* | 0.185\*\*\* | 0.173\*\*\* |
|  | (0.0359) | (0.0359) | (0.0361) | (0.0361) | (0.0396) | (0.0386) |
| RGDP | -0.108 | -0.322\*\*\* | -0.382\*\*\* | -0.347\*\*\* | 0.0377 | -0.164 |
|  | (0.0725) | (0.119) | (0.121) | (0.103) | (0.0743) | (0.110) |
| RGDPsim | 0.451\*\*\* | 0.443\*\*\* | 0.449\*\*\* | 0.446\*\*\* | 0.293\*\* | 0.297\*\* |
|  | (0.125) | (0.128) | (0.128) | (0.130) | (0.129) | (0.133) |
| DGDPCAP | 2.277\*\*\* | 2.245\*\*\* | 2.271\*\*\* | 2.217\*\*\* | 2.806\*\*\* | 2.708\*\*\* |
|  | (0.422) | (0.426) | (0.429) | (0.433) | (0.496) | (0.503) |
| SQDGDPCAP | -0.193 | -0.185 | -0.193 | -0.178 | -0.333\* | -0.309\* |
|  | (0.158) | (0.158) | (0.159) | (0.160) | (0.176) | (0.176) |
| DGDPcapROW | -3.364\*\*\* | -3.381\*\*\* | -3.347\*\*\* | -3.352\*\*\* | -2.790\*\*\* | -2.796\*\*\* |
|  | (0.693) | (0.697) | (0.698) | (0.696) | (0.668) | (0.673) |
| minREG\_QUAL | 2.852\*\*\* | 2.889\*\*\* | 2.895\*\*\* | 3.013\*\*\* | 3.285\*\*\* | 3.358\*\*\* |
|  | (0.368) | (0.373) | (0.371) | (0.378) | (0.381) | (0.378) |
| IMPORTS |  | 0.235\*\* |  |  |  |  |
|  |  | (0.0960) |  |  |  |  |
| INT\_IMPS\_BEC |  |  | 0.293\*\*\* |  |  |  |
|  |  |  | (0.0955) |  |  |  |
| INT\_IMPS\_BVS |  |  |  | 0.184\*\*\* |  | 0.141\*\*\* |
|  |  |  |  | (0.0484) |  | (0.0519) |
| minVSwld |  |  |  |  | 7.599\*\*\* | 6.920\*\*\* |
|  |  |  |  |  | (1.403) | (1.481) |
| Constant | 17.69\*\*\* | 26.19\*\*\* | 29.04\*\*\* | 27.90\*\*\* | 5.929 | 15.11\*\*\* |
|  | (3.413) | (4.950) | (5.133) | (4.544) | (3.995) | (5.242) |
| Observations | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 |
| r2\_p | 0.501 | 0.506 | 0.508 | 0.512 | 0.522 | 0.528 |
| Correctly Pred p(FTA)=FTA | 86.1% | 85.6% | 86.2% | 86.3% | 87.0% | 87.8% |
| Correctly Predicted FTA=1 | 66.3% | 67.5% | 68.7% | 69.6% | 69.9% | 72.1% |
| Correctly predicted FTA=0 | 94.5% | 93.3% | 93.7% | 93.5% | 94.2% | 94.5% |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The marginal effects for these estimations, evaluated at the mean, are reported in the appendix (Table A.3.7). They suggest that a 1% increase in imports leads to an increase in the likelihood of an agreement of 3.3 percentage points. The same increase in the BEC identified measure of intermediate goods trade raises this probability by 4.1 percentage points whereas a 1% increase in the measure of vertical specialisation increases the probability of an agreement by 2.5 percentage points holding all else equal at mean values.

Although the results above presented are in line with the predictions made in this paper, the estimations used have applied no controls for either simultaneity or unobserved heterogeneity and they are hence likely to be biased. In Table 7, an attempt to control for unobserved heterogeneity and simultaneity is made through the use of an FD estimator. It captures differences in the data between 2000 and 1995 to predict changes in FTA status by 2008[[112]](#footnote-112). This eliminates the time invariant and unobserved component of the error term that may be causing biases (see equation 7)[[113]](#footnote-113). Another way of putting this is that it controls for initial *levels* of trade to determine whether *changes* in trade affect the probability that a country *switches* into a trade agreement. First differences are taken with respect to the year 2000 rather than the end of the sample period to mitigate biases arising from simultaneity. These are discussed at greater lengths in the Appendix A3.5 where a robustness check, using different base years in the first differencing strategy, is provided[[114]](#footnote-114). These changes are used to predict FTA status switches taking place between 1995 and 2008.

Column (1) of Table 7 shows that switches into FTAs are driven by changes in; the similarity of GDP; differences in per capita GDP; and changes to the minimum dyadic regulatory quality. Columns (2) and (3) see the introduction of changes in total import flows and changes in intermediate imports (identified through the BEC nomenclature) into the FTA formation estimation. These show a positive coefficient suggesting that higher changes in this type of trade are associated with a higher likelihood of switching into an FTA by 2008. The results in column (4) suggest that the probability of switching into an agreement is increasing in the growth in the value of intermediate imports that are part of a bilateral value chain (lnintimps\_BVS). The introduction of this measure is also associated with a larger explanatory power.

Column (5) then highlights that increases in the degree of global vertical specialisation, or the participation in international modes of production, are also associated with a higher likelihood of switching into an FTA. This may be evidence of the shifting political economy forces that are associated with higher degrees of this measure. The final column introduces the change in the value of bilateral vertically specialised trade in conjunction with the indicator of global vertical specialisation. The results suggest that both have a positive impact on the likelihood of an FTA. The marginal effects, reporter in the Appendix Table A3.8, reveal that a 1% positive change in the growth of vertically specialised trade leads to a 9 percentage point increase in the likelihood of switching into an agreement[[115]](#footnote-115)

**Table 7: FD Estimator – Impact of VS on the probability of an FTA (1995-2000)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| dRGDP | -0.0911 | -0.288\*\* | -0.235\* | 0.0912 | 0.269\*\* | 0.317\*\*\* |
|  | (0.112) | (0.129) | (0.126) | (0.123) | (0.115) | (0.122) |
| dRGDPsim | 0.375\*\* | 0.439\*\*\* | 0.445\*\*\* | 0.572\*\*\* | 0.627\*\*\* | 0.679\*\*\* |
|  | (0.159) | (0.169) | (0.167) | (0.184) | (0.195) | (0.206) |
| dDGDPCAP | -0.713\*\* | -0.655\*\* | -0.635\*\* | -0.647\* | -0.659\* | -0.651\* |
|  | (0.302) | (0.316) | (0.311) | (0.341) | (0.346) | (0.366) |
| dSQDGDPCAP | 0.404\*\*\* | 0.406\*\*\* | 0.398\*\*\* | 0.446\*\*\* | 0.441\*\*\* | 0.464\*\*\* |
|  | (0.0773) | (0.0806) | (0.0791) | (0.0895) | (0.0890) | (0.0953) |
| dDGDPcapROW | -3.466\*\*\* | -3.469\*\*\* | -3.387\*\*\* | -3.379\*\*\* | -3.547\*\*\* | -3.506\*\*\* |
|  | (0.383) | (0.410) | (0.399) | (0.413) | (0.433) | (0.442) |
| dminREG\_QUAL | 1.646\*\*\* | 1.617\*\*\* | 1.606\*\*\* | 1.727\*\*\* | 1.931\*\*\* | 1.942\*\*\* |
|  | (0.218) | (0.217) | (0.216) | (0.222) | (0.230) | (0.233) |
| dIMPORTS |  | 0.332\*\*\* |  |  |  |  |
|  |  | (0.0953) |  |  |  |  |
| dINT\_IMPS\_BEC |  |  | 0.215\*\* |  |  |  |
|  |  |  | (0.0919) |  |  |  |
| dINT\_IMPS\_BVS |  |  |  | 0.326\*\*\* |  | 0.193\*\*\* |
|  |  |  |  | (0.0680) |  | (0.0657) |
| dminVSwld |  |  |  |  | 8.489\*\*\* | 6.951\*\*\* |
|  |  |  |  |  | (0.885) | (0.968) |
| Constant | -0.643\*\*\* | -0.746\*\*\* | -0.717\*\*\* | -0.841\*\*\* | -0.983\*\*\* | -1.035\*\*\* |
|  | (0.0956) | (0.0996) | (0.0997) | (0.109) | (0.109) | (0.115) |
| Observations | 1,090 | 1,052 | 1,052 | 1,052 | 1,090 | 1,052 |
| r2\_p | 0.130 | 0.131 | 0.126 | 0.157 | 0.202 | 0.196 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

d identifies differences in the independent variables from 1995 to 200

An alternative way of controlling for unobserved heterogeneity and simultaneity is through an IV approach. This introduces exogenous variation into the trade measures. However, as anticipated, providing support for the validity of the instruments used can be complicated. Nevertheless, three instruments were identified and used to look at the impact of trade flows on the probability of an FTA being formed. The first is the minimum share of Co2 emissions over GDP. It is expected to be correlated with manufacturing activity and hence drive a measure of demand for imported inputs whilst remaining uncorrelated with the desirability of engaging in an FTA[[116]](#footnote-116). The second instrument used captures the minimum density of telephone lines which should be correlated with the infrastructure of a country and hence also import demand. The final instrument is a measure of the minimum per capita expenditure on health services. The results for the IV estimation are presented in the Appendix. A3.7. A priori, the instruments are valid in the sense that they are significantly correlated with all the measures of trade flows. They also pass the Wald test of exogeneity. The results suggest that all three measures of trade play a positive role in determining the probability of a country engaging in a new FTA. However distinguishing how each measure impacts FTA formation is complex because they are all constructed using the same instruments[[117]](#footnote-117).

### Determinants of New FTAs: Interdependence Effects

This section delves deeper into the role that interdependence plays in the formation of new agreements. This is approached through the same FD estimator so that, here too, the estimated coefficients capture the impact of changes in the independent variables rather than the effects of levels. This is convenient as it is changes in the formation of neighbouring agreements which are likely to bring forth changes in the decisions to engage in FTAs as Baldwin’s theory of regionalism suggests. Table 8 reports the results obtained from introducing various measures of interdependence into the baseline estimation shown in Column (1) of Table 7. The coefficients of these baseline variables are omitted for brevity[[118]](#footnote-118). The first column introduces BJ2010’s contagion indicator (wexpFTA)[[119]](#footnote-119). It captures the domino effects predicted by Baldwin’s (1993) original hypothesis. The results suggest that changes in export market shares, as a result of neighbouring regionalism, positively and significantly affect the probability of a new agreement being signed. The second column then looks at contagion effects occurring through vertically specialised trade (wbvsFTA) where the weights attributed to the FTA variable are measured in terms of the share of vertically specialised intermediate exports. Here too, supportive evidence is given to the notion that contagion can arise through the interconnection of international production as this measure positively affects the probability of switching into an agreement. Looking at the differences in the results in these two columns reveals that both have a similar impact on the likelihood of an FTA but the vertically specialised measure of contagion appears to yield a larger predictive power in the FTA formation equation.

The third column introduces Baier et al.’s (2010) indicator of ‘own FTA’ which captures changes in the internal political economy dynamics. The original hypothesis that the probability of engaging in an FTA is increasing in the number of trade agreements already signed is confirmed. This measure captures evolving political economy dynamics in the spirit of Ornelas (2005) and Baldwin’s juggernaut effect[[120]](#footnote-120). Columns (4) to (6) then show that the introduction of the measure of vertically specialised trade does not alter the results obtained from the measures of interdependence. Positive changes in vertically specialised trade remain important drivers of FTAs even when contagion effects are accounted for.

**Table 8: Interdependence Effects (changes 1995-2000)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| dwexpFTA\_o | 3.965\*\*\* |  |  | 4.212\*\*\* |  |  |
|  | (0.396) |  |  | (0.426) |  |  |
| dwbvsFTA\_o |  | 3.700\*\*\* |  |  | 3.792\*\*\* |  |
|  |  | (0.425) |  |  | (0.442) |  |
| dcountFTA\_o |  |  | 0.098\*\*\* |  |  | 0.087\*\*\* |
|  |  |  | (0.015) |  |  | (0.015) |
| dINT\_IMPS\_BVS |  |  |  | 0.385\*\*\* | 0.368\*\*\* | 0.302\*\*\* |
|  |  |  |  | (0.079) | (0.078) | (0.069) |
| Constant | -0.877\*\*\* | -0.836\*\*\* | -0.957\*\*\* | -1.128\*\*\* | -1.069\*\*\* | -1.098\*\*\* |
|  | (0.106) | (0.105) | (0.108) | (0.126) | (0.124) | (0.118) |
| Observations | 1090 | 1090 | 1,090 | 1,052 | 1,052 | 1,052 |
| r2\_p | 0.207 | 0.216 | 0.166 | 0.238 | 0.244 | 0.184 |

Robust standard errors in parentheses,\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Overall, the cross-sectional models seem to confirm the original hypotheses of this paper. The inclusion of the new identified variables increase the predictive powers of the FTA formation equations and suggest that new agreements seem to be better explained through the introduction of measures of governance, changes in vertically specialised trade and interdependence effects. This gives supportive evidence to the notion that changes in the incentives to form agreements arise from changes in the typology of trade[[121]](#footnote-121).

Two caveats in this analysis need be noted. First, the use of a reduced sample, both in terms of time and country coverage, may be problematic. The country coverage does not include LDCs and hence is not totally representative of world economic activity. Nevertheless, the sample captures a significant proportion of new FTAs signed. Many of these are North-North and North-South agreements but few are South-South agreements. It would also have been desirable to extend the sample in time so as to identify how the new determinants of FTAs behave during the different waves. This was not possible on account of data constraints. Governance measures are only available since the mid-90’s as are harmonised indicators of vertically specialised trade[[122]](#footnote-122).

### Panel Data Approach

This section uses panel data techniques to identify the role of the changing nature of trade on the formation of new agreements. Such techniques can provide additional controls for the biases that arise from unobserved heterogeneity. However, as anticipated, estimating binary dependent variable models with fixed effects may introduce problems related to ‘incidental parameters’. This implies that the desirable properties of the FE estimator may not be properly utilised[[123]](#footnote-123). Nevertheless, alternative estimation procedures, that provide similar controls for endogeneity, are available as discussed in the empirical section. One such alternative is the use of a Mundlak-Chamberlain approach that conditions the correlation between the unobserved variable and the independent variable. Another is an IV approach that introduces independent variation in the endogenous trade variables. These techniques are used herein to determine whether the hypotheses put forward in this paper hold.

The use of panel data is desirable for various reasons. First, it provides additional mechanisms through which to control for issues of endogeneity. Second, it allows for both temporal and cross-sectional variance in the regressors. Thirdly, the use of a panel setting facilitates the use of temporal lags when the impact of variables is likely to be delayed (slow-moving variable impact). This may arise for the measures of vertical specialisation and the interdependence effects.

Table 9 presents the results obtained from the panel data estimations of an augmented FTA formation model with the following specification.



(12)

It introduces the quality of the regulatory framework (minREG\_QUAL); the value of vertically specialised intermediate imports (lnINT\_IMPS\_BVS) with a one year lag; and the interdependence variable (wbvsFTA), also with a one year lag. The first column captures the coefficient estimates of the pooled linear probability model (LPM). Here no controls are introduced to mitigate the biases caused by unobserved heterogeneity. Nevertheless, the results capture the positive impact of vertically specialised trade on the probability that a country forms an FTA. It also highlights the positive role of interdependencies and regulatory frameworks in this process. The signs of the coefficients obtained are in line with the predictions of the traditional literature and the earlier observed results. The second column shows the results for a pooled logit estimation. Here too the signs of the coefficients are comparable with those earlier obtained. The third column then uses a random effect estimator. This introduces many changes in both the sign and the magnitude of the impacts. This is unsurprising because the estimator assumes that there is no correlation between the unobservables and the independent variables which is counter to the received wisdom (Baier et al. 2008).

Column 4 then runs a conditional logit (clogit) estimation that uses a group-wise pseudo fixed-effects approach. The observations are grouped by dyad and hence represent a ‘within’ variation which is similar to that of the FD model earlier estimated (albeit with more data points). This implies a reduction in the estimated sample which only considers countries which have witnessed changes in their FTA status. The coefficients reported appear to be in line with the predictions made throughout this paper. It supports the positive role of vertically specialised trade, governance measures and interdependence effects. However the non-linearities, originally captured by the SQDGPDCAP variable, no longer appear. One of the concerns, in interpreting the results of this estimation is that only within variation is captured for countries that change agreement and hence that the coefficient estimates are capturing the impact of changes in country characteristics only of countries that have effectively switched into an agreement[[124]](#footnote-124).

In the fifth column, an instrumented measure of vertically specialised trade is introduced. This is done by running a panel data gravity model in the guise of that run in Lopez-Gonzalez (2012) and using the predicted values from this in a second step conditional logit model[[125]](#footnote-125). The correction of the standard errors is undertaken through a panel bootstrap with 500 replacements. The results obtained are similar to those of the preceding column however the role of vertically specialised trade appears to be significantly lower.

Column 6 introduces a Mundlak-Chamberlain approach to control for unobserved heterogeneity[[126]](#footnote-126). The results are also in line with the predictions made in the cross sectional analysis and capture the positive role that measures of governance; vertically specialised trade; and interdependence play in the formation of new agreements. However, the per capita GDP measures exhibit some strange coefficients. DGDPCAP is now negative and the other similar measures are now insignificant. The role of the squared GDP per capita term has been reversed, implying that this term does not enter the specification non-linearly in the same way than originally predicted in Baier and Bergstrand (2004). This might arise as a direct consequence of the changing nature of trade. Differences in capital labour ratios between countries may be even more welfare enhancing in a scenario where production structures are fragmented and hence there might not be any decreasing returns to the degree of complementarity that arises between countries. Furthermore, a wider difference in K/L ratios with respect to the RoW might also make a country more attractive insofar as it could enhance the potential for further specialisation. However, a cautionary word, in the interpretation of these coefficients, deserves mention. This final estimation includes observation averaged variables (not reported) in addition to the normal variables and hence some ‘level’ effects may be overriding some of the ‘changes’ effects that are captured in the reported coefficients.

**Table 9: Determinants of FTAs - Panel Estimations**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | (1) | (2) | (3) | (4) | (5) | (6) |
| VARIABLES |  | OLS | LOGIT | RE | FE | FE-IV | MC |
| NATURAL | (+) | 0.0350\*\*\* | 0.654\*\*\* | 4.972\*\*\* |  |  |  |
|  |  | (0.00418) | (0.0692) | (0.504) |  |  |  |
| REMOTE | (+) | 0.00775\*\*\* | 0.0991\*\*\* | 1.578\*\*\* |  |  |  |
|  |  | (0.00101) | (0.0137) | (0.151) |  |  |  |
| RGDP | (+) | 0.00534\*\*\* | 0.320\*\*\* | 0.252 | 2.896\*\*\* | 2.773\*\*\* | 2.330\*\*\* |
|  |  | (0.00191) | (0.0361) | (0.225) | (0.172) | (0.166) | (0.766) |
| RGDPsim | (+) | 0.0295\*\*\* | 0.809\*\*\* | 3.147\*\*\* | 3.899\*\*\* | 4.164\*\*\* | 1.226 |
|  |  | (0.00230) | (0.0535) | (0.531) | (0.487) | (0.325) | (0.958) |
| DGDPCAP | (+) | 0.0677\*\*\* | 1.301\*\*\* | 0.625 | 2.169\*\*\* | 1.431\*\*\* | -4.186\*\*\* |
|  |  | (0.00723) | (0.161) | (1.062) | (0.627) | (0.508) | (1.490) |
| SQDGDPCAP | (-) | -0.0119\*\*\* | -0.199\*\*\* | -0.194 | 1.139\*\*\* | 1.124\*\*\* | 0.159 |
|  |  | (0.00175) | (0.0584) | (0.323) | (0.275) | (0.220) | (0.564) |
| DGDPcapROW | (-) | -0.112\*\*\* | -2.936\*\*\* | -10.02\*\*\* | 0.791 | 1.933\*\*\* | -0.931 |
|  |  | (0.00606) | (0.217) | (0.969) | (0.795) | (0.717) | (1.902) |
| minREG\_QUAL | (+) | 0.0576\*\*\* | 1.387\*\*\* | 6.748\*\*\* | 3.876\*\*\* | 2.817\*\*\* | 5.440\*\*\* |
|  |  | (0.00402) | (0.0969) | (0.748) | (0.477) | (0.398) | (1.561) |
| L. INT\_IMPS\_BVS | (+) | 0.00617\*\*\* | 0.0687\*\*\* | 0.282\*\* | 1.490\*\*\* | 0.175\*\*\* | 0.633\*\*\* |
|  |  | (0.00108) | (0.0199) | (0.135) | (0.0873) | (0.0362) | (0.220) |
| L.wbvsFTA | (+) | 0.656\*\*\* | 4.507\*\*\* | 16.78\*\*\* |  |  | 14.05\*\*\* |
|  |  | (0.0113) | (0.125) | (1.846) |  |  | (1.081) |
| Constant |  | 0.214\*\* | -11.54\*\*\* | 27.21\*\* |  |  | 23.03 |
|  |  | (0.0927) | (1.595) | (11.59) |  |  | (18.48) |
| YEAR |  | Y | Y | Y | N | N | N |
| DYAD |  | N | N | Y | Y | Y | Y |
| Observations |  | 14,132 | 14,132 | 14,132 | 3,744 | 3,744 | 14,132 |
| r2\_p |  | 0.565\* | 0.607 | 0.589 | 0.678 | 0.575 | 0.583 |
| ll |  | -638.4 | -2616 | -1076 | -842.8 | -1112 | -1007 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Conclusions

This paper puts forward the hypothesis that changes in the typology of trade, evidenced by the rise in vertical specialisation, generate new incentives for countries to engage in new FTAs. It identifies three distinct waves of regionalism and provides some comparative static evidence that suggests that the latest wave involves countries that are more distant and that exhibit wider differences in their factor endowments than in the past. This leads to changes in the expected coefficient estimates of the ‘traditional’ models of FTA formation (Baier and Bergstrand, 2004). But the rise in vertically specialised trade also introduces new incentives to form new agreements and this arises through three distinct channels.

The first is through the emergence of a greater demand for appropriate regulatory frameworks. More complex modes of international production require the presence of more ‘suited’ regulatory frameworks so as to avoid inefficient ‘hold-ups’ (Antras and Staiger, 2011). This suggests that the desirability of an FTA between two countries could be tied to the prevailing quality of regulatory frameworks. Countries with better regulatory quality are seen to have a higher likelihood of signing an FTA. However, a low regulatory quality, within certain ‘acceptable’ levels, can also provide countries with opportunities to redress regulatory shortcomings through an FTA.

The second channel through which the changing nature of trade affects the likelihood of an FTA being formed arises from changes in the internal political economy dynamics. As countries embrace international modes of production, their dependence on cheaper foreign inputs grows and this means that tariffs are increasingly going to act as production taxes rather than protectionist measures (as the literature on effective rates of protection suggests). This re-shapes the internal political economy forces towards further support for more liberal trade policy stances in an effort to reduce the costs of intermediate products. Because vertically specialised firms are also involved in export markets, the growth in this type of trade also generates a greater demand for market access and hence for the formation of new FTAs.

The proliferation of neighbouring trade agreements also has an impact on a country’s decision to engage in FTAs as Baldwin’s (1993) domino theory of regionalism suggests. The third channel of influence arises from the threat of delocalisation of segments of production in other countries. If China signs a trade agreement with Korea, this might jeopardise Mexico’s position within a value chain, and hence domestic political economy forces will rally in favour of a Mexico-China FTA. The changing nature of trade then introduces new forms of FTA ‘contagion’ (Baldwin and Jaimovich, 2010).

Some of the findings of this paper point towards directions for future research. For example, the introduction of governance measures is novel in this type of analysis, and has been shown to greatly increase the predictive powers of an FTA formation model. However, causation issues are hard to disentangle and this opens up new avenues for research. Particularly in an effort to understand how regulatory frameworks, vertical specialisation and FTAs interact. This is likely to become an issue of growing importance and one that might be pivotal in understanding how multilateral institutions and regionalism co-exist. This paper adds to Orefice and Rocha’s (2011) investigations into such links.

In a related note, one caveat of this study is that it does not include measures of multilateral liberalisation as Mansfield and Reinhardt (2003) suggest should be done in such models. A mitigating factor is that the period under investigation begins just after the Uruguay round is concluded and is short enough to not have substantially changed external multilateral conditions. Furthermore, common changes in the multilateral system may be controlled for using different temporal intercepts such as those used in the FD estimations.

However, a more general issue arises from the sample used in the estimations. The analysis conducted in this paper has ‘dropped’ all observations for countries that belonged to an agreement before the year the sample began. This was done to focus on the creation of new agreements rather than the existence of agreements. This introduces an element of selection in the estimation that requires further thought. Although it makes sense to compare countries that have switched into an agreement against those that have not switched and are not presently in an agreement, the selection of the ‘control’ sample may require a more rigorous approach in the guise of a ‘heck-probit’ model.

Nevertheless, the empirical analysis of this paper provides important contributions to the empirical literature on FTA formation. Understanding what motivates new agreements is important in itself, but more so in view of ascertaining how the world trading system is likely to evolve. The WTO may face important challenges in maintaining its role as arbiter of international trade if it cannot reconcile the new determining features of regionalism with its system.

## Bibliography

Anderson, J. & Marcouiller, D. (2002). "Insecurity And The Pattern Of Trade: An Empirical Investigation," *The Review of Economics and Statistics*, MIT Press, vol. 84(2), pages 342-352, May

Anderson, J. E., & Van Wincoop, E. (2003) "Gravity with Gravitas: A Solution to the Border Puzzle," *American Economic Review*, American Economic Association, vol. 93(1), pages 170-192, March.

Antras, P. (2003) "Firms, Contracts, and Trade Structure," *Quarterly Journal of Economics*, Vol. 118, pp. 1375-1418.

Antras, P. & Staiger, W. (2011) “Offshoring and the Role of Trade Agreements” Mimeo: Harvard University

Acharya, R., Crawford, J. A., Maliszewska, M. et Renard, C. (2010), “Landscape”, in Chauffour, J. P. et Maur, J. C. (éds), *Preferential Trade Agreement Policies for Development : A* *Handbook*, World Bank, Washington (D.C.).

Bagwell, Kyle & Staiger, Robert W. (1997) "Multilateral tariff cooperation during the formation of customs unions," *Journal of International Economics*, Elsevier, vol. 42(1-2), pages 91-123, February.

Bagwell, K. & Staiger, R, (1998) "Will Preferential Agreements Undermine the Multilateral Trading System?," *Economic Journal*, Royal Economic Society, vol. 108(449), pages 1162-82, July.

Bagwell, K., and Staiger, R., (1999) “An Economic Theory of GATT” *American Economic Review*, Vol. 89, No. 1, pp. 215-248.

Bagwell, K., and Staiger, R., (2002) “The Economics of the World Trading System” the MIT Press, Cambridge, MA

Bagwell, K., and Staiger, R., (2004) "Multilateral trade negotiations, bilateral opportunism and the rules of GATT/WTO," *Journal of International Economics*, Elsevier, vol. 63(1), pages 1-29, May.

Baier, S.L & Bergstrand, J.H., (2004) “Economic Determinants of Free Trade Agreements” *Journal of International Economics*, Vol 64, No. 1, October 2004, 29-63 .

Baier, S.L., Bergstrand, J.H., Egger, P. (2007) “The New Regionalism: Causes and Consequences” *Économie internationale 109 (2007), p. 9-29*

Baier, S.L., Bergstrand, J.H., Egger, P., Mclaughlin, P., (2008) "Do Economic Integration Agreements Actually Work?  Issues in Understanding the Causes and Consequences of the Growth of Regionalism," *The World Economy*, vol. 31, No. 4, April 2008, 461-497.

Baier, S.L., Bergstrand, J.H. & Mariutto, R. (2010) “Economic Determinants of Free Trade Agreements Revisited: Distinguishing Source of Interdependence” University of Notre Dame Working Paper. December 2011 version

http://www.nd.edu/~jbergstr/Working\_Papers/Growth\_of\_Bilateralism.pdf

Baldwin, Richard E. (1993). ‘A Domino Theory of Regionalism’ *NBER WP4465* (Cambridge)

Baldwin, Richard E. (1997) “The Causes of Regionalism,” *The World Economy*. Vol. 20, No. 7: 865-888.

Baldwin, Richard E. (2006) "Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade," *The World Economy*, Blackwell Publishing, vol. 29(11), pages 1451-1518, November.

Baldwin, Richard E. (2006b). "Managing the Noodle Bowl: The fragility of East Asian Regionalism" CEPR Discussion Paper 5561, C.E.P.R. Discussion Papers.

Baldwin, Richard E. (2011) “ 21st Century Regionalism: Filling the gap between 21st century trade and 20th century trade rules” *WTO Economic Research and Statistics Division. Staff Working Paper ERSD-2011-08*. Paper presented at the WTO’s “Workshop on PTAs and the WTO: A New Era”.

Baldwin, R. E. and Jaimovich, D. (2010) “Are free trade agreements contagious?” *National Bureau of Economic Research*, Working Paper No. 16084.

Baldwin, R. & Rieder, R. (2007) “A Test of Endogeneous Trade Bloc Formation Theory on EU data” *CEPR Discussion Paper* No. 6389 July 2007

Baldwin, R. & Thorton, P. (2008) “Multilateralising Regionalism” *Centre for Economic Policy Research (CEPR)*ISBN: 978-1-898128-99-1

Bergsten, C.F. (1997). “Open Regionalism,” *The World Economy*, Vol. 20, no. 5: 545-65.

Bergstrand, J.H, Egger,P & Larch, M. (2010) “ Economic Determinants of the Timing of Preferential Trade Agreement Formations and Enlargements”

Bhagwati, J. (1990). “Departures from Multilateralism: Regionalism and Aggressive Unilateralism” *Economic Journal*. Vol. 100, Issue 403: 1304-1317.

Bhagwati, J. (1993). “Regionalism and Multilateralism: An Overview.” J. de Melo and A. Panagariya, eds. *New Dimensions in Regional Integration.* Cambridge, UK: Cambridge University Press.

Bhagwati, J. (2008) *Termites in the Trading System: How Preferential Trade Agreements Undermine Free Trade.* Oxford University Press

Bhagwati, J. and A. Panagariya (1996). “Preferential Trading Areas and Multilateralism: Strangers, Friends, or Foes?” in J. Bhagwati and A. Panagariya, eds. *The* *Economics of Preferential Trade Agreements.* Washington, DC: AEI Press.

Burfisher, M., Robinson, S. & Thierfelder, K. (2003) “ Regionalism: Old and New, Theory and Practice” Agricultural Policy Reform and the WTO: Where are we Heading? Invited paper presented at conference Capri, June 23-26, 2003

Chamberlain, Gary (1980) “Analysis of Covariance with Qualitative Data” *Review of Economic Studies* 47, 225-238.

Egger, H., Egger, P,. & Greenaway, D. (2008) "The trade structure effects of endogenous regional trade agreements," *Journal of International Economics*, Elsevier, vol. 74(2), pages 278-298, March.

Egger, P., and Larch, M., (2008) ‘Interdependent preferential trade agreement memberships: an empirical analysis’, *Journal of International Economics*, 76, 384–99

Estevadeordal, A., Freund, C., & Ornelas, E. (2008) “Does regionalism affect trade liberalization toward non-members?” *Quarterly Journal of Economics* **123**, 1531-1575.

Ethier, Wilfred J, (1998) "The New Regionalism," *Economic Journal*, Royal Economic Society, vol. 108(449), pages 1149-61, July.

Ethier, Wilfred J., (2007) "*The theory of trade policy and trade agreements: A critique*," European Journal of Political Economy, Elsevier, vol. 23(3), pages 605-623, September.

Freund, Caroline, (2000) "Multilateralism and the endogenous formation of preferential trade agreements," *Journal of International Economics*, Elsevier, vol. 52(2), pages 359-376, December.

Frankel, Jeffrey (1997) “The Regionalisation of the World Economy” Chicago: The University of Chicago Press.

Frankel, J. A. & Stein, E. & Wei, S-J, (1996) "Regional Trading Arrangements: Natural or Supernatural," *American Economic Review*, American Economic Association, vol. 86(2), pages 52-56, May.

Freund, C. & Ornelas, E. (2010) "Regional trade agreements," *Policy Research Working Paper Series* 5314, The World Bank.

Greene, W. (2010) *Econometric Analysis*. Seventh Edition. Pearson.

Grossman, G. M., & Helpman, E., (1995) "The Politics of Free-Trade Agreements," *American Economic Review*, American Economic Association, vol. 85(4), pages 667-90, September.

Holmes, Tammy (2005) “What Drives Regional Trade Agreements that Work” HEI Working Paper No: 07/2005

Horn, H., G. Maggi, and R. W. Staiger. (2010) “Trade Agreements as Endogenously Incomplete Contracts” *American Economic Review* 100(1): 394-419.

Honoré, B. (2002): “Nonlinear Models with Panel Data”, *Portuguese Economic Journal*, 1, 163-179.

Hummels, D; Ishii, J; & Yi, K-M. (2001), “The Nature and Growth of Vertical Specialization in World Trade.” *Journal of International Economics*, 54, pp. 75-96.

Imbens, G., Wooldridge, J. (2007) “What’s New in Econometrics” *National Bureau of Economic Research.* Summer Institute Lecture slides (Non-linear Panel Data Models - http://www.nber.org/minicourse3.html)

Krugman, Paul, (1991a). “Is Bilateralism Bad?” In *International Trade and Trade Policy*, edited by Elhanan Helpman and Assaf Razin. Cambridge, MA: MIT Press.

Krugman, Paul., (1991b). The Move Toward Free Trade Zones. In *Policy Implications of Trade and Currency Zones*, proceedings of a Federal Reserve Bank of Kansas City symposium.

Levy, Philip, I. (1997) “A Political-Economy Analysis of Free-Trade Agreements” The *American Economic Review*, Vol. 87, No. 4 (Sept., 1997), 506-519

Levchenko, Andrei (2007), “Institutional Quality and International Trade,” *Review of Economic Studies*, 74:3, 791-819.

Lamy, P. (2002). “Stepping Stones or Stumbling Blocks? The EU’s Approach Towards the Problem of Multilateralism vs Regionalism in Trade Policy,” *World Economy*. Vol. 25, No. 10: 1399-1413.

Lopez-Gonzalez, J., (2012) “The Impact of Free Trade Agreements on Vertical Specialisation” NCCR Working Paper

Lopez-Gonzalez, J., and Holmes, P., (2011) “The Nature and Evolution of Vertical Specialisation: What role for Preferential Trade Agreements” NCCR Working Paper 2011/41.

Magee, Christopher. (2003). ‘Endogenous Preferential Trade Agreements: An Empirical Analysis’, *Contributions to Economic Analysis and Policy* Volume 2 Issue 3 Article 15.

Magee, Christopher., (2008) “New Measures of Trade Creation and Trade Diversion,” *Journal of International Economics* 75, 340 – 362

Maggi, G. and A. Rodriguez-Clare.2007. “A Political-Economy Theory of Trade Agreements.” *American Economic Review* 97(4): 1374-1406.

Manger, Mark, S. (2009) “Vertical Trade Specialization and PTA Formation” Paper presented at the workshop on “The Politics of Trade Agreements: Theory, Measurement, and empirical analysis,” Niehaus Center for Globalization and Governance, Princeton Unniversity, April 29-30, 2010

Mansfield, E., & Milner, H. (1999) “The New Wave of Regionalism.” *International Organization*. Summer 1999, v.53,N.3:589-627.

Mansfield, E., Milner, H. and Rosendorff, B.P., (2000) Free to Trade: Democracies, Autocracies, and International Trade, *American Political Science Review*, Vol. 94, N°2, june.

Mansfield, E., Milner, H. and Rosendorff, B.P., (2002) Why do democracies cooperate more: electoral control and international trade negotiations, *International Organization*, 56, 3, Summer, pp. 477-513.

Mansfielf, E., Milner, H. & Pevehouse J. (2008) “Democracy, Veto players, and the depth of Regional Integration”. *World Economy,* Vol. 31, Issue 1, pp. 67-96, January 2008

Mansfield, E D. & Reinhardt, E. (2003), “Multilateral determinants of regionalsim: The effects of GATT/WTO on the formation of preferential trading arrangements” *International* *Organization* 57, 829-862.

Nunn, Nathan (2007), “Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade”. *The Quarterly Journal of Economics (2007) 122(2): 569-600*

Orefice, G. & Rocha, N. (2011), “Deep integration and production networks: an empirical analysis,” World Trade Organization Economic Research and Statistics Division, Staff Working Paper ERSD-2011-11.

Ornelas, Emanuel (2005a), “Trade-creating free trade areas and the undermining of multilateralism”, *European Economic Review* 49, 1717-1735

Ornelas, Emanuel (2005b), “Rent destruction and the political viability of free trade agreements,” *Quarterly Journal of Economics* 120, 1475-1506.

Ornelas, Emanuel (2005c), “Endogenous free trade agreements and the multilateral trading system,” *Journal of International Economics* 67, 471-497.

Ornelas, Emanuel. (2008) “Trade liberalization, outsourcing, and the hold-up problem” *Journal of International Economics*. Volume 74, Issue1, January 2008, Pages 225-241.

Ornelas, E & Turner, J. (2008), “Trade Liberalization, Outsourcing, and the Hold Up Problem,” *Journal of International Economics*, 74:1, pp. 225-241.

Rodrik, D., Subramanian, A. Trebbi, F. (2002) "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development," mimeo, Harvard University.

Samuelson, Paul A. (2001) “A Ricardo-Sraffa Paradigm Comparing Gains from Trade in Inputs and Finished Goods” *Journal of Economic Literature* , Vol. 39, No. 4 (Dec., 2001), pp. 1204-1214

Viner Jacob. (1950) "The Customs Union Issue" New York: Carnegie Endowment for International Peace.

Wooldridge, Jeffrey M. (2002), Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge, MA.

WTO (2011), World Trade Report 2011, Geneva.

Yi, S.-S. (1996), Endogenous formation of customs unions under imperfect competition: Open regionalism is good,” *Journal of International Economics* 41, 151-175.

## Appendix A3

### A3.1. Characteristics of FTA partners

The figures presented in the body of the text show the characteristics of FTA partners in the year that an agreement enters into force. However Baier and Bergstrand (2004) use a baseline year of 1960 in their analysis so as to avoid any possible endogeneity arising from the correlation of trade agreements and measures of economic mass. The figure below shows that the results are qualitatively the same when this is replicated in the entire sample for the baseline year 1960.

**Figure A3.1:** **Characteristics of FTA partners – Economic Mass and Income (1960)**



**Source:** Calculations from CEPII’s gravity database, economic data for 1960. FTA is identified if dyad shares an agreement in 2006

**Note:** Difference in GDP is defined as the absolute difference in the logs of the GDPs of the dyad countries. GDP per Capita difference is also the absolute difference in the log of the GDP per capita of the dyad countries.

The analysis of the different waves of regionalism was also carried out using a baseline year of 1960. The figure below shows that using different years, such as the year of the beginning of the agreement, produces similar results.

**Figure A3.2: Economic mass and Income differences between FTA partners across the different waves of regionalism – values at 1960**

**Source:** Calculations from CEPII’s gravity database, data from 1960. First Wave identifies countries that signed a trade agreement between 1960 and 1984. The Second wave requires there to be a new agreement between 1985 and 1994 whilst the third captures new agreements signed between 1995 and 2006. Differences in economic mass are measures through the absolute difference in the logs of the GDPs of the dyads.



**Figure A3.3: Characteristics of third wave FTA partners versus non FTA partners (2006).**



**Source:** Calculations from CEPII’s gravity database, data from 2006. Bold blue line identifies dyads that have signed an FTA during the third wave. Bold red line identifies dyads that have never signed an FTA.

### A3.2: Database summary statistics:

**Table A3.1. Summary statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
|  |  |  |  |  |  |
| FTA | 20748 | 0.3869289 | 0.4870589 | 0 | 1 |
| newFTA | 20748 | 0.219973 | 0.414238 | 0 | 1 |
| NATURAL | 20748 | -8.351051 | 1.111235 | -9.88258 | -4.08795 |
| REMOTE | 20748 | 3.338295 | 4.165442 | 0 | 9.604952 |
| RGDP | 20748 | 52.8258 | 2.021133 | 46.16747 | 59.39784 |
| RGDPsim | 20748 | -1.467634 | 0.904541 | -6.77196 | -0.69315 |
| DGDPCAP | 20748 | 1.28893 | 1.039722 | 0.00028 | 4.564457 |
| SQDGDPCAP | 20748 | 2.74231 | 3.832856 | 7.86E-08 | 20.83427 |
| DGDPcapROW | 20748 | 1.136153 | 0.5189738 | 0.008495 | 3.539416 |
|  |  |  |  |  |  |
| minVoice\_acc | 20748 | 0.512327 | 0.7684196 | -1.71874 | 1.814402 |
| minRol | 20748 | 0.4483433 | 0.8043411 | -1.11595 | 1.939776 |
| minPol\_stab | 20748 | 0.0872928 | 0.8104919 | -2.03537 | 1.454821 |
| minGov\_eff | 20748 | 0.5807846 | 0.7210308 | -0.83264 | 2.142508 |
| minreg\_qual | 20748 | 0.5643998 | 0.6559972 | -1.07531 | 1.880103 |
|  |  |  |  |  |  |
| Lnimports | 20710 | 6.05769 | 2.190186 | -6.583224 | 12.58039 |
| Lnintimp\_BEC | 20710 | 5.587141 | 2.224157 | -5.979344 | 11.96324 |
| Lnintimp\_BVS | 20590 | 6.743704 | 3.724486 | -19.04363 | 11.27024 |
| VSWLD | 20710 | 0.3170656 | 0.1371201 | 0.002995 | 0.816159 |
|  |  |  |  |  |  |
| countFTA | 20748 | 14.31637 | 10.3769 | 0 | 29 |
| countFTArow | 20748 | 7.19785 | 7.462788 | 0 | 29 |
| wexpFTA | 20710 | -.1631003 | 0.3444812 | 0 | 0.984415 |
| wbvsFTA | 20710 | 0.6464864 | 0.3748953 | 0 | 0.998597 |

**Table A3.2. Summary statistics (panel)**

| **Variable** |  | **Mean** | **Std. Dev.** | **Min** | **Max** | **Observations** |
| --- | --- | --- | --- | --- | --- | --- |
| FTA | overall | 0.386929 | 0.487059 | 0 | 1 | N = 20748 |
|  | between |  | 0.439228 | 0 | 1 | n = 1482 |
|  | within |  | 0.210776 | -0.54164 | 1.3155 | T = 14 |
|  |  |  |  |  |  |  |
| newfta | overall | 0.219973 | 0.414238 | 0 | 1 | N = 20748 |
|  | between |  | 0.414368 | 0 | 1 | n = 1482 |
|  | within |  | 0 | 0.219973 | 0.219973 | T = 14 |
|  |  |  |  |  |  |  |
| NATURAL | overall | -8.35105 | 1.111235 | -9.88258 | -4.08795 | N = 20748 |
|  | between |  | 1.111583 | -9.88258 | -4.08795 | n = 1482 |
|  | within |  | 0 | -8.35105 | -8.35105 | T = 14 |
|  |  |  |  |  |  |  |
| REMOTE | overall | 3.338295 | 4.165442 | 0 | 9.604952 | N = 20748 |
|  | between |  | 4.166747 | 0 | 9.604952 | n = 1482 |
|  | within |  | 0 | 3.338295 | 3.338295 | T = 14 |
|  |  |  |  |  |  |  |
| RGDP | overall | 52.8258 | 2.021133 | 46.16747 | 59.39784 | N = 20748 |
|  | between |  | 1.949821 | 46.80285 | 59.0728 | n = 1482 |
|  | within |  | 0.534376 | 51.02711 | 57.06868 | T = 14 |
|  |  |  |  |  |  |  |
| RGDPsim | overall | -1.46763 | 0.904541 | -6.77196 | -0.69315 | N = 20748 |
|  | between |  | 0.873368 | -6.40778 | -0.69474 | n = 1482 |
|  | within |  | 0.236432 | -3.79728 | 0.633898 | T = 14 |
|  |  |  |  |  |  |  |
| DGDPCAP | overall | 1.28893 | 1.039722 | 0.00028 | 4.564457 | N = 20748 |
|  | between |  | 0.971241 | 0.007903 | 4.488735 | n = 1482 |
|  | within |  | 0.37189 | -0.99263 | 4.22026 | T = 14 |
|  |  |  |  |  |  |  |
| SQDGDPCAP | overall | 2.74231 | 3.832856 | 7.86E-08 | 20.83427 | N = 20748 |
|  | between |  | 3.590383 | 0.000101 | 20.1511 | n = 1482 |
|  | within |  | 1.344624 | -5.45585 | 17.6888 | T = 14 |
|  |  |  |  |  |  |  |
| DGDPcapRoW | overall | 1.136153 | 0.518974 | 0.008495 | 3.539416 | N = 20748 |
|  | between |  | 0.488523 | 0.183032 | 3.098337 | n = 1482 |
|  | within |  | 0.175582 | 0.119586 | 1.844044 | T = 14 |
|  |  |  |  |  |  |  |
| minVoi\_acc | overall | 0.512327 | 0.76842 | -1.71874 | 1.814402 | N = 20748 |
|  | between |  | 0.753621 | -1.528 | 1.546162 | n = 1482 |
|  | within |  | 0.151259 | -0.12505 | 0.90208 | T = 14 |
|  |  |  |  |  |  |  |
| minRol | overall | 0.448343 | 0.804341 | -1.11595 | 1.939776 | N = 20748 |
|  | between |  | 0.79111 | -0.90716 | 1.863745 | n = 1482 |
|  | within |  | 0.146634 | -0.20901 | 1.028451 | T = 14 |
|  |  |  |  |  |  |  |
| minPol\_stab | overall | 0.087293 | 0.810492 | -2.03537 | 1.454821 | N = 20748 |
|  | between |  | 0.771615 | -1.50497 | 1.270505 | n = 1482 |
|  | within |  | 0.248759 | -0.96202 | 0.803981 | T = 14 |
|  |  |  |  |  |  |  |
| minGov\_eff | overall | 0.580785 | 0.721031 | -0.83264 | 2.142508 | N = 20748 |
|  | between |  | 0.697832 | -0.55685 | 2.011447 | n = 1482 |
|  | within |  | 0.182266 | -0.03533 | 1.168117 | T = 14 |
|  |  |  |  |  |  |  |
| Minreg\_qual | overall | 0.5644 | 0.655997 | -1.07531 | 1.880103 | N = 20748 |
|  | between |  | 0.614247 | -0.71344 | 1.647874 | n = 1482 |
|  | within |  | 0.230802 | -0.29259 | 1.61287 | T = 14 |
|  |  |  |  |  |  |  |
| lnIMPORTS | overall | 6.05769 | 2.190186 | -6.583224 | 12.58039 | N = 20710 |
|  | between |  | 2.116098 | -1.895212 | 12.28444 | n = 1482 |
|  | within |  | .5626767 | -.0781112 | 10.10082 | T-bar = 13.9744 |
|  |  |  |  |  |  |  |
| lnINTIMPS\_BEC | overall | 5.587141 | 2.224157 | -5.979344 | 11.96324 | N = 20710 |
|  | between |  | 2.146415 | -2.159427 | 11.66313 | n = 1482 |
|  | within |  | .5818033 | -.8450785 | 10.10569 | T-bar = 13.9744 |
|  |  |  |  |  |  |  |
| lnINTIMPS\_BVS | overall | -.1631003 | 3.724486 | -12.13587 | 11.27024 | N = 20710 |
|  | between |  | 3.516845 | -5.62951 | 10.70017 | n = 1482 |
|  | within |  | 1.225842 | -1.08048 | 10.58313 | T-bar = 13.9744 |
|  |  |  |  |  |  |  |
| bvswld\_o | overall | 0.317066 | 0.13712 | 0.002995 | 0.816159 | N = 20710 |
|  | between |  | 0.093914 | 0.165115 | 0.526723 | n = 1482 |
|  | within |  | 0.100065 | -0.05341 | 0.755386 | T-bar = 13.9744 |
|  |  |  |  |  |  |  |
| countFTA\_o | overall | 14.31637 | 10.3769 | 0 | 29 | N = 20748 |
|  | between |  | 9.367344 | 0 | 23.28571 | n = 1482 |
|  | within |  | 4.47079 | -2.39792 | 31.03065 | T = 14 |
|  |  |  |  |  |  |  |
| wexpFTA\_o | overall | .3654931 | .3486506 | 0 | .9839385 | N = 20748 |
|  | between |  | .3236264 | 0 | .9199914 | n = 1482 |
|  | within |  | .1299571 | -.4423418 | 1.018985 | T-bar = 14 |
|  |  |  |  |  |  |  |
| wexpbvsFTA\_o | overall | .3875159 | .4279464 | 0 | .9999816 | N = 20710 |
|  | between |  | .4007341 | 0 | .9998144 | n = 1482 |
|  | within |  | .1505021 | -.5387159 | 1.05969 | T-bar = 13.9744 |

### A3.3: Changes in the traditional determinants of FTAs

*Waves of Regionalism and Treatment of Existing Agreements*

Looking at the determinants of new FTAs requires thinking about how pre-existing agreements are to be treated in the estimation procedure. The traditional FTA formation models compare the characteristics of preferential partners to those of non-preferential countries to ascertain the role of the independent variables of interest on the outcome (i.e. FTA=1). However, when one wants to look at the determinants of new agreements, it is important to think carefully about the nature of the ‘control’ group which implies tackling the presence of pre-existing FTAs in the sample.

Consider the observations used to estimate the determinants of the latest wave of regionalism in Table 3 column 4. Here there are three different sub-categories of countries in the sample; one that has not signed any agreement; one that signed an agreement during an earlier wave; and one that is engaging in a new agreement during this final wave. The question is, how should one treat pre-existing agreements in the sample (the second category of countries)? Two simple options are available, either remove these or leave these in. Each option has its merits and pitfalls. First recall that the dependent variable in this estimation is equal to 1 when a country signs an agreement during the identified lapse of the wave. Also consider that the interest of the investigation is to ascertain the determining characteristics of the partners that are engaged in new FTAs. Now consider leaving countries with pre-existing agreements in the sample. This implies that one is effectively comparing the countries that engage in new regionalism against both the countries that do not engage in FTAs AND those that were already part of an FTA signed during a preceding wave. Because the latter group will have characteristics that make it desirable for them to sign an FTA as the existence of an agreement shows, then leaving these in the sample can cloud the coefficients obtained the estimation. However if one removes the observations for countries that have pre-existing agreements then one is effectively introducing an element of selection into the estimations. The dependent variable is then capturing the incidence of signing a new agreement contingent on not having signed any agreements in the past. This selection bias could be mitigated by introducing a Heckman control function that identifies the determinants of not engaging in an agreement. The Mills-ratio obtained is then introduced in subsequent FTA formation equations hence reducing the selection biases. However such a ‘non-selection’ model would require the identification of a variable that was correlated with not being in an agreement but uncorrelated with engaging in an agreement. It is hard to think of any variable that would satisfy this criterion.

Because it is desirable to compare countries that sign new FTAs against those that have not signed, the estimations in the text are run by removing pre-existing agreements from the sample. However it is also important to note how the results might change in a sample where pre-existing agreements are maintained. This is shown in the Table below. Here it becomes immediately obvious that the predictive powers of the FTA formation equation fall significantly. The rate of true positives is only 3% during the latest wave. This lower explanatory power of the FTA formation equations may be due to the aforementioned comparisons between countries that are signing a new agreement against those that have not signed AND those that are already in an agreement. Although a hard choice, the removal of dyads with an agreement is the preferred method of dealing with pre existing agreements as it makes more sense to compare countries that engage in new FTAs against those that do not engage in FTAs at all.

**Table A3.3: Traditional FTA formation equation without removal of pre-existing agreements.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | | (3) | | (4) | |
| VARIABLES | FTA in 2006 | FTA: **first wave** 1960-1985 | | FTA: **Second wave** 1985-1995 | | FTA: **Third wave** 1995-2006 | |
| NATURAL | 1.948\*\*\* | | 1.397\*\*\* | | 1.302\*\*\* | | 1.265\*\*\* | |
|  | (0.0578) | | (0.0713) | | (0.0613) | | (0.0532) | |
| REMOTE | 0.0575\*\*\* | | 0.134\*\*\* | | 0.249\*\*\* | | -0.0335\*\*\* | |
|  | (0.00725) | | (0.0183) | | (0.0187) | | (0.0102) | |
| RGDP | 0.218\*\*\* | | 0.213\*\*\* | | 0.122\*\*\* | | 0.135\*\*\* | |
|  | (0.0111) | | (0.0224) | | (0.0140) | | (0.0121) | |
| RGDPsim | 0.115\*\*\* | | -0.0702 | | 0.414\*\*\* | | 0.103\*\*\* | |
|  | (0.0256) | | (0.0447) | | (0.0513) | | (0.0305) | |
| DGDPCAP | 0.434\*\*\* | | -0.393\* | | 1.253\*\*\* | | 1.097\*\*\* | |
|  | (0.130) | | (0.230) | | (0.213) | | (0.127) | |
| SQDGDPCAP | -0.219\*\*\* | | -0.0155 | | -0.488\*\*\* | | -0.254\*\*\* | |
|  | (0.0438) | | (0.0734) | | (0.0739) | | (0.0312) | |
| DGDPcapROW | -0.623\*\*\* | | -0.123 | | 0.316\*\*\* | | -0.756\*\*\* | |
|  | (0.0724) | | (0.106) | | (0.0827) | | (0.0788) | |
| Constant | 11.03\*\*\* | | 3.399\*\*\* | | 2.933\*\*\* | | 5.455\*\*\* | |
|  | (0.541) | | (0.695) | | (0.643) | | (0.553) | |
| Observations | 19,740 | | 19,740 | | 19,460 | | 19,740 | |
| r2\_p | 0.441 | | 0.385 | | 0.433 | | 0.214 | |
| Correctly Predicted p(FTA)=FTA | 91.46% | | 96.89% | | 95.72% | | 99.63% | |
| Correctly Predicted FTA=1\* | 43.29% | | 15.93% | | 11.54% | | 2.89% | |
| Correctly predicted FTA=0 | 97.84% | | 99.85% | | 99.32% | | 99.63% | |
|  |  |  | |  | |  | |
| Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  Pseudo\_r2 calculated as 1 minus the ratio of the log likelihood value for estimated model and that predicted by a model with just an intercept (like in BB2004).  Values are for the different base years. Column (1): 1970; Wave 1: 1970; Wave 2: 1985; Wave 3, 1995.  \*Sum of new agreements across different waves is larger than that of agreements in 2006. This reflects agreements that expired | | | | | | | |

*Sensitivity of results to different specifications of the waves of regionalism*

Table A3.4. provides a sensitivity check on the robustness of the economic determinants of FTAs using different years to identify the waves of regionalism. The results suggest that restricting the last wave so that it incorporates only agreements that were signed after 1999 makes a stronger case for arguing that the determinants of 21st Century Regionalism are different from the other waves (predictive powers of the model fall considerably to only predicting 5% of the agreements in place).

**Table A3.4:** **Determinants of FTAs across the different waves of regionalism – Full Sample (1960 values) Different temporal coverage of waves**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | | (3) | | (4) | |
| VARIABLES | FTA in 2006 | FTA: **first wave** 1960-1980 | | FTA: **Second wave** 1980-1999 | | FTA: **Third wave** 1999-2006 | |
| NATURAL | 1.936\*\*\* | | 1.440\*\*\* | | 1.823\*\*\* | | 1.631\*\*\* | |
|  | (0.0578) | | (0.0729) | | (0.0707) | | (0.0669) | |
| REMOTE | 0.0573\*\*\* | | 0.133\*\*\* | | 0.203\*\*\* | | -0.0234\*\* | |
|  | (0.00726) | | (0.0189) | | (0.0133) | | (0.0100) | |
| RGDP | 0.219\*\*\* | | 0.198\*\*\* | | 0.254\*\*\* | | 0.263\*\*\* | |
|  | (0.0111) | | (0.0230) | | (0.0155) | | (0.0150) | |
| RGDPsim | 0.114\*\*\* | | -0.0965\*\* | | 0.453\*\*\* | | 0.101\*\*\* | |
|  | (0.0257) | | (0.0456) | | (0.0491) | | (0.0332) | |
| DGDPCAP | 0.441\*\*\* | | -0.515\*\* | | 0.432\*\* | | 1.000\*\*\* | |
|  | (0.131) | | (0.230) | | (0.206) | | (0.146) | |
| SQDGDPCAP | -0.223\*\*\* | | 0.0344 | | -0.219\*\*\* | | -0.306\*\*\* | |
|  | (0.0443) | | (0.0701) | | (0.0691) | | (0.0365) | |
| DGDPcapROW | -0.638\*\*\* | | -0.0374 | | 0.0989 | | -0.522\*\*\* | |
|  | (0.0733) | | (0.112) | | (0.0800) | | (0.0813) | |
| Constant | 10.93\*\*\* | | 3.805\*\*\* | | 6.219\*\*\* | | 5.860\*\*\* | |
|  | (0.541) | | (0.692) | | (0.652) | | (0.604) | |
| Observations | 19,460 | | 19,460 | | 18,842 | | 18,028 | |
| r2\_p | 0.439 | | 0.382 | | 0.508 | | 0.272 | |
| Correctly Predicted p(FTA)=FTA | 92.78% | | 98.39% | | 96.48% | | 95.86% | |
| Correctly Predicted FTA=1\* | 43.29%  (781 of 1804) | | 14.71%  (50 of 340) | | 37.5%  (300 of 800) | | 4.97%  (34 of 684) | |
| Correctly predicted FTA=0 | 97.84% | | 99.87% | | 99.09% | | 99.45% | |
|  |  |  | |  | |  | |
| Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  Pseudo\_r2 calculated as 1 minus the ratio of the log likelihood value for estimated model and that predicted by a model with just an intercept (like in BB2004).  Values are for the different base years. Column (1): 1970; Wave 1: 1970; Wave 2: 1980; Wave 3, 1999.  \*Sum of new agreements across different waves is larger than that of agreements in 2006. This reflects agreements that expired | | | | | | | |

#### A.3.4 Determinants of FTAs – Governance Measures

It is argued, in the body of the text, that the minimum regulatory quality measure of a dyadic observation explains a greater amount of the variance in the formation of new FTAs. This could imply that countries aim to engage in FTAs to redress shortfalls in bilateral regulatory quality. It then becomes relevant to look into the degree to which measures of governance and the probability of engaging in an FTA are related. In the figure below such a relationship is plotted through a regression of the predicted values from a ‘traditional’ (Baier and Bergstrand 2004) FTA formation model against the regulatory quality variable observed from a dyadic observation. To allow for non-linearities, the squared and cubed terms are also introduced[[127]](#footnote-127). The shape that emerges sees the probability of engaging in an FTA, at low levels of regulatory quality, initially falling. Once a certain threshold is passed it then rises only to fall subsequently at high levels of regulatory quality. Such a relationship between these variables supports the idea that there is a non monotonic relationship between regulatory quality and FTA formation. It is also supportive of the idea that at lower levels, once a threshold has been passed, the probability of signing a trade agreement is rising so that countries may wish to engage in trade agreements to redress lower regulatory quality.

**Figure A3.4: Non-monotonic relationship between regulatory quality and FTA formation.**



The figure below then plots the relationship between the difference in regulatory quality and the fitted values from a traditional FTA formation model[[128]](#footnote-128). Another non-monotonic relationship also emerges. This one suggest that low differences in regulatory quality see the probability of an FTA rising, however a rising difference in regulatory quality is then associated with a falling probability of FTA formation till another threshold is reached were, at very high differences, the probability of engaging in an FTA rises. This provides further support to the story that sees countries engaging in FTAs in an effort to redress shortfalls in regulatory quality.

**Figure A3.5: Non-monotonic relationship between difference in regulatory quality and probability of FTA**



### A3.5. Determinants of FTAs – Simultaneity in Using Trade based measures

Using First-Differences to capture the impact of trade flows on the formation of FTAs is an adequate method of dealing with biases arising from unobserved heterogeneity provided that the source of these biases is dyadic in nature and time invariant. However dealing with simultaneity using similar specifications is a little bit more complicated.

Simultaneity biases arise from the positive impact of FTAs on trade flows (see Lopez-Gonzalez (2012) for a justification of this assertion). Using changes in trade flows between 2008 and 1995 to predict FTA formation will not deal with these biases because these changes will be affected by the presence of an FTA. This will lead to upward biases in the coefficients of interest. Avoiding these biases requires estimating this model using changes in trade flows *before* the conclusion of an agreement. But because the switch into an agreement happens for different countries at different periods in time, then one has to think carefully how to treat changes in trade flows between countries that have not signed an agreement.

Consider a world of three countries; Mexico, Germany and Indonesia, where the impact of trade flows on the conclusion of an FTA is addressed through a first difference model. Such an approach would control for the unobserved bilateral characteristics that cause Mexico to trade more or less with Germany or Indonesia by limiting the variance in trade flows to changes in these rather than to differences in levels. However, because the conclusion of an agreement between Mexico and Germany, in 2001, is likely to positively affect changes in trade flows, then one should use changes in trade flows before the conclusion of said agreement to eliminate simultaneity biases. So, in this instance, an appropriate estimation of the role of trade flows on the formation of new FTAs would take first differences between 2000 and 1995 and see whether Mexico’s trade with Germany grew at a faster rate than Mexico’s trade with Indonesia. But now imagine that Mexico had delayed signing NAFTA and only entered into an agreement with Canada in 1997. This would imply that cut off point for the FD model should no longer be the year 2000 but rather earlier so as to avoid simultaneity in the impact of this agreement on Mexican and Canadian trade.

The introduction of more agreements then further complicates things hence the choice of the cut-off point cannot be easily made. Although the incidence of simultaneity should fall with earlier cut-off points as the probability of increasing pre FTA flows increases. Table A3.5, provides a robustness check for different cut-off points to those provided in the body of the text. The first column uses first differences between values from 1997 and 1995. Column (2) and three see the cut-off point a little later in 1998 and 1999 respectively.

**Table A3.5: Robustness of FD model to different cut-off points.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| Variables | 1997-1995 | 1998-1995 | 1999-1995 |
| dRGDP | 0.534\* | 0.886\*\*\* | 0.294\*\* |
|  | (0.277) | (0.223) | (0.124) |
| dRGDPsim | 0.986\*\*\* | 0.603\*\* | 0.386\*\* |
|  | (0.312) | (0.247) | (0.180) |
| dDGDPCAP | -1.092\*\*\* | -0.673\*\* | -0.553\* |
|  | (0.401) | (0.288) | (0.324) |
| dSQDGDPCAP | 0.751\*\*\* | 0.527\*\*\* | 0.417\*\*\* |
|  | (0.166) | (0.108) | (0.0869) |
| dDGDPcapROW | -2.836\*\*\* | -3.079\*\*\* | -3.035\*\*\* |
|  | (0.726) | (0.539) | (0.359) |
| dminreg\_qual | 1.972\*\*\* | 2.176\*\*\* | 1.585\*\*\* |
|  | (0.284) | (0.296) | (0.224) |
| dlnintimps\_bvsbil\_o | 0.385\*\*\* | 0.483\*\*\* | 0.408\*\*\* |
|  | (0.0785) | (0.0751) | (0.0697) |
| Constant | -1.003\*\*\* | -0.753\*\*\* | -0.796\*\*\* |
|  | (0.102) | (0.105) | (0.0988) |
| Observations | 1,074 | 1,074 | 1,076 |
| r2\_p | 0.103 | 0.137 | 0.143 |

Robust standard errors in parentheses,\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### A3.6. Marginal Effects for cross-sectional estimations

**Table A3.6. Marginal Effects for results in Table 4, Determinants of new FTAs – Measures of Governance 2008**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| NATURAL | 0.140\*\*\* | 0.124\*\*\* | 0.174\*\*\* | 0.231\*\*\* | 0.222\*\*\* | 0.185\*\*\* | 0.210\*\*\* |
|  | (0.0254) | (0.0233) | (0.0244) | (0.0287) | (0.0263) | (0.0243) | (0.0233) |
| REMOTE | 0.0299\*\*\* | 0.0301\*\*\* | 0.0280\*\*\* | 0.0259\*\*\* | 0.0224\*\*\* | 0.0280\*\*\* | 0.0276\*\*\* |
|  | (0.00547) | (0.00546) | (0.00586) | (0.00619) | (0.00623) | (0.00610) | (0.00633) |
| RGDP | -0.0385\*\*\* | -0.0386\*\*\* | -0.0262\*\*\* | -0.0193\* | -0.0135 | -0.0186\* | -0.0153 |
|  | (0.00852) | (0.00821) | (0.00962) | (0.0100) | (0.0105) | (0.0106) | (0.0107) |
| RGDPsim | 0.0135 | 0.00369 | 0.0438\*\*\* | 0.0452\*\*\* | 0.0446\*\*\* | 0.0450\*\*\* | 0.0638\*\*\* |
|  | (0.0150) | (0.0153) | (0.0159) | (0.0158) | (0.0154) | (0.0155) | (0.0155) |
| DGDPCAP | 0.231\*\*\* | 0.230\*\*\* | 0.342\*\*\* | 0.337\*\*\* | 0.300\*\*\* | 0.319\*\*\* | 0.322\*\*\* |
|  | (0.0601) | (0.0579) | (0.0641) | (0.0605) | (0.0644) | (0.0634) | (0.0648) |
| SQDGDPCAP | -0.0535\*\*\* | -0.0558\*\*\* | -0.0557\*\* | -0.0605\*\*\* | -0.0225 | -0.0285 | -0.0272 |
|  | (0.0195) | (0.0185) | (0.0223) | (0.0222) | (0.0246) | (0.0233) | (0.0233) |
| DGDPcapROW | -0.343\*\*\* | -0.345\*\*\* | -0.464\*\*\* | -0.385\*\*\* | -0.590\*\*\* | -0.539\*\*\* | -0.476\*\*\* |
|  | (0.0535) | (0.0504) | (0.0750) | (0.0726) | (0.0883) | (0.0812) | (0.0751) |
| minPol\_stab |  | -0.0538\*\* |  |  |  |  |  |
|  |  | (0.0253) |  |  |  |  |  |
| minRol |  |  | 0.189\*\*\* |  |  |  |  |
|  |  |  | (0.0256) |  |  |  |  |
| minVoice\_acc |  |  |  | 0.276\*\*\* |  |  |  |
|  |  |  |  | (0.0434) |  |  |  |
| minctr\_corr |  |  |  |  | 0.292\*\*\* |  |  |
|  |  |  |  |  | (0.0304) |  |  |
| minGov\_eff |  |  |  |  |  | 0.366\*\*\* |  |
|  |  |  |  |  |  | (0.0366) |  |
| minreg\_qual |  |  |  |  |  |  | 0.403\*\*\* |
|  |  |  |  |  |  |  | (0.0390) |
| Observations | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 |
| r2\_p | 0.350 | 0.353 | 0.398 | 0.413 | 0.446 | 0.450 | 0.501 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Evaluated at the mean

**Table A3.7. Marginal Effects for results in Table 6, Determinants of new FTAs – Trade based measures 2008**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| NATURAL | 0.140\*\*\* | 0.210\*\*\* | 0.184\*\*\* | 0.182\*\*\* | 0.167\*\*\* | 0.215\*\*\* | 0.184\*\*\* |
|  | (0.0254) | (0.0233) | (0.0250) | (0.0243) | (0.0251) | (0.0242) | (0.0266) |
| REMOTE | 0.0299\*\*\* | 0.0276\*\*\* | 0.0258\*\*\* | 0.0247\*\*\* | 0.0244\*\*\* | 0.0260\*\*\* | 0.0240\*\*\* |
|  | (0.00547) | (0.00633) | (0.00612) | (0.00609) | (0.00604) | (0.00692) | (0.00650) |
| RGDP | -0.0385\*\*\* | -0.0153 | -0.0449\*\* | -0.0534\*\*\* | -0.0477\*\*\* | 0.00531 | -0.0228 |
|  | (0.00852) | (0.0107) | (0.0184) | (0.0190) | (0.0160) | (0.0104) | (0.0160) |
| RGDPsim | 0.0135 | 0.0638\*\*\* | 0.0619\*\*\* | 0.0627\*\*\* | 0.0613\*\*\* | 0.0413\*\* | 0.0413\*\* |
|  | (0.0150) | (0.0155) | (0.0155) | (0.0156) | (0.0156) | (0.0167) | (0.0169) |
| DGDPCAP | 0.231\*\*\* | 0.322\*\*\* | 0.313\*\*\* | 0.317\*\*\* | 0.305\*\*\* | 0.395\*\*\* | 0.376\*\*\* |
|  | (0.0601) | (0.0648) | (0.0644) | (0.0648) | (0.0640) | (0.0726) | (0.0721) |
| SQDGDPCAP | -0.0535\*\*\* | -0.0272 | -0.0258 | -0.0270 | -0.0245 | -0.0469\* | -0.0429\* |
|  | (0.0195) | (0.0233) | (0.0230) | (0.0232) | (0.0229) | (0.0258) | (0.0254) |
| DGDPcapROW | -0.343\*\*\* | -0.476\*\*\* | -0.472\*\*\* | -0.468\*\*\* | -0.461\*\*\* | -0.393\*\*\* | -0.388\*\*\* |
|  | (0.0535) | (0.0751) | (0.0739) | (0.0744) | (0.0722) | (0.0778) | (0.0767) |
| minreg\_qual |  | 0.403\*\*\* | 0.403\*\*\* | 0.404\*\*\* | 0.414\*\*\* | 0.462\*\*\* | 0.467\*\*\* |
|  |  | (0.0390) | (0.0384) | (0.0383) | (0.0385) | (0.0418) | (0.0417) |
| lnimports\_o |  |  | 0.0329\*\* |  |  |  |  |
|  |  |  | (0.0143) |  |  |  |  |
| lnintimps\_bec\_o |  |  |  | 0.0410\*\*\* |  |  |  |
|  |  |  |  | (0.0145) |  |  |  |
| lnintimps\_bvsbil\_o |  |  |  |  | 0.0253\*\*\* |  | 0.0196\*\* |
|  |  |  |  |  | (0.00733) |  | (0.00780) |
| minbvswld |  |  |  |  |  | 1.070\*\*\* | 0.961\*\*\* |
|  |  |  |  |  |  | (0.207) | (0.213) |
| Observations | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 |
| r2\_p | 0.350 | 0.501 | 0.506 | 0.508 | 0.512 | 0.522 | 0.528 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Evaluated at the mean

**Table A3.8. Marginal Effects for results in Table 7, Determinants of new FTAs – FD Estimations Trade based measures (1995-2000)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| dRGDP | -0.0623\*\* | -0.103\*\*\* | -0.104\*\*\* | -0.0222 | 0.00612 | 0.0110 |
|  | (0.0296) | (0.0331) | (0.0329) | (0.0285) | (0.0292) | (0.0282) |
| dRGDPsim | 0.148\*\*\* | 0.140\*\*\* | 0.141\*\*\* | 0.147\*\*\* | 0.161\*\*\* | 0.155\*\*\* |
|  | (0.0407) | (0.0396) | (0.0396) | (0.0396) | (0.0390) | (0.0395) |
| dDGDPCAP | -0.111\* | -0.109\* | -0.108\* | -0.122\* | -0.124\* | -0.126\* |
|  | (0.0640) | (0.0635) | (0.0639) | (0.0673) | (0.0680) | (0.0688) |
| dSQDGDPCAP | 0.0651\*\*\* | 0.0656\*\*\* | 0.0665\*\*\* | 0.0776\*\*\* | 0.0703\*\*\* | 0.0769\*\*\* |
|  | (0.0171) | (0.0171) | (0.0173) | (0.0187) | (0.0175) | (0.0184) |
| dDGDPcapROW | -0.700\*\*\* | -0.704\*\*\* | -0.709\*\*\* | -0.699\*\*\* | -0.710\*\*\* | -0.699\*\*\* |
|  | (0.0766) | (0.0768) | (0.0771) | (0.0767) | (0.0760) | (0.0755) |
| dminreg\_qual | 0.255\*\*\* | 0.255\*\*\* | 0.259\*\*\* | 0.281\*\*\* | 0.289\*\*\* | 0.294\*\*\* |
|  | (0.0433) | (0.0430) | (0.0433) | (0.0435) | (0.0439) | (0.0439) |
| dlnimports\_o |  | 0.0733\*\*\* |  |  |  |  |
|  |  | (0.0223) |  |  |  |  |
| dlnintimps\_bec\_o |  |  | 0.0743\*\*\* |  |  |  |
|  |  |  | (0.0199) |  |  |  |
| dlnintimps\_bvsbil\_o |  |  |  | 0.0913\*\*\* |  | 0.0610\*\*\* |
|  |  |  |  | (0.0130) |  | (0.0136) |
| dminbvswld |  |  |  |  | 1.486\*\*\* | 1.014\*\*\* |
|  |  |  |  |  | (0.193) | (0.223) |
| Observations | 1,090 | 1,085 | 1,084 | 1,080 | 1,090 | 1,080 |
| r2\_p | 0.129 | 0.139 | 0.142 | 0.176 | 0.176 | 0.193 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Evaluated at the mean

**Table A3.9. Marginal Effects for results in Table 8, Determinants of new FTAs – FD Estimations Interdependence (1995-2000)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| dRGDP | 0.0133 | 0.0140 | 0.0113 | 0.0630\*\* | 0.0593\*\* | 0.0416 |
|  | (0.0259) | (0.0260) | (0.0240) | (0.0285) | (0.0286) | (0.0253) |
| dRGDPsim | 0.0705\*\* | 0.0680\* | 0.0767\*\* | 0.108\*\*\* | 0.107\*\*\* | 0.116\*\*\* |
|  | (0.0352) | (0.0348) | (0.0338) | (0.0385) | (0.0389) | (0.0387) |
| dDGDPCAP | -0.171\*\* | -0.182\*\*\* | -0.162\*\* | -0.160\*\* | -0.173\*\* | -0.157\*\* |
|  | (0.0675) | (0.0666) | (0.0645) | (0.0747) | (0.0759) | (0.0720) |
| dSQDGDPCAP | 0.0850\*\*\* | 0.0886\*\*\* | 0.0835\*\*\* | 0.0947\*\*\* | 0.0983\*\*\* | 0.0942\*\*\* |
|  | (0.0168) | (0.0169) | (0.0162) | (0.0195) | (0.0198) | (0.0186) |
| dDGDPcapROW | -0.607\*\*\* | -0.633\*\*\* | -0.604\*\*\* | -0.577\*\*\* | -0.608\*\*\* | -0.619\*\*\* |
|  | (0.0787) | (0.0789) | (0.0761) | (0.0823) | (0.0842) | (0.0852) |
| dminreg\_qual | 0.265\*\*\* | 0.268\*\*\* | 0.286\*\*\* | 0.293\*\*\* | 0.298\*\*\* | 0.312\*\*\* |
|  | (0.0439) | (0.0448) | (0.0428) | (0.0453) | (0.0464) | (0.0437) |
| dwexpFTA\_o | 0.777\*\*\* |  |  | 0.822\*\*\* |  |  |
|  | (0.0835) |  |  | (0.0879) |  |  |
| dwbvsFTA\_o |  | 0.729\*\*\* |  |  | 0.746\*\*\* |  |
|  |  | (0.0919) |  |  | (0.0956) |  |
| dcountFTA\_o |  |  | 0.0188\*\*\* |  |  | 0.0170\*\*\* |
|  |  |  | (0.00286) |  |  | (0.00306) |
| dlnintimps\_bvsbil\_o |  |  |  | 0.0750\*\*\* | 0.0724\*\*\* | 0.0589\*\*\* |
|  |  |  |  | (0.0144) | (0.0145) | (0.0131) |
| Observations | 1,090 | 1,090 | 1,090 | 1,052 | 1,052 | 1,052 |
| r2\_p | 0.207 | 0.216 | 0.166 | 0.238 | 0.244 | 0.184 |

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Evaluated at the mean

### A3.7: Cross Sectional Instrumental Variable Estimation

**Table A3.10: Instrumental Variable Approach**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VARIABLES | (1)  Step 1 | (2)  Step 2 | (3)  Step 1 | (4)  Step 2 | (5)  Step 1 | (6)  Step 2 |
| NATURAL | 0.824\*\*\* | 0.118 | 0.764\*\*\* | -0.111 | 1.706\*\*\* | -0.0824 |
|  | (0.0508) | (0.214) | (0.0478) | (0.241) | (0.0992) | (0.246) |
| REMOTE | 0.0529\*\*\* | 0.0777\*\*\* | 0.0549\*\*\* | 0.0367 | 0.118\*\*\* | 0.0550\* |
|  | (0.0114) | (0.0264) | (0.0108) | (0.0336) | (0.0248) | (0.0304) |
| RGDP | 0.984\*\*\* | -0.864\*\*\* | 0.979\*\*\* | -1.340\*\*\* | 1.395\*\*\* | -0.796\*\*\* |
|  | (0.0210) | (0.249) | (0.0213) | (0.310) | (0.0411) | (0.198) |
| RGDPsim | 0.0963\*\*\* | 0.138\* | 0.0726\*\* | 0.149\* | 0.287\*\*\* | 0.0835 |
|  | (0.0318) | (0.0742) | (0.0328) | (0.0833) | (0.0868) | (0.0834) |
| DGDPCAP | -0.0523 | 1.137\*\*\* | -0.0786 | 1.068\*\*\* | 0.0679 | 1.005\*\*\* |
|  | (0.0980) | (0.253) | (0.105) | (0.281) | (0.194) | (0.272) |
| SQDGDPCAP | -0.0374 | -0.131\* | -0.0442 | -0.0999 | -0.165\*\*\* | -0.0739 |
|  | (0.0262) | (0.0776) | (0.0281) | (0.0853) | (0.0492) | (0.0848) |
| DGDPcapROW | 0.110 | -1.415\*\*\* | 0.179 | -1.402\*\*\* | 0.282 | -1.405\*\*\* |
|  | (0.109) | (0.228) | (0.112) | (0.256) | (0.215) | (0.236) |
| minreg\_qual | 0.0815 | 1.497\*\*\* | 0.0974 | 1.687\*\*\* | -0.361\*\*\* | 1.882\*\*\* |
|  | (0.0635) | (0.146) | (0.0707) | (0.168) | (0.128) | (0.205) |
| minco2pc | 0.0365\*\*\* |  | 0.00681 |  | 0.0439 |  |
|  | (0.0130) |  | (0.0139) |  | (0.0269) |  |
| mintellines | -0.0198\*\*\* |  | -0.0181\*\*\* |  | -0.0365\*\*\* |  |
|  | (0.00391) |  | (0.00421) |  | (0.00873) |  |
| minhealthpc | -0.000130\* |  | -0.000204\*\*\* |  | -0.000330\*\* |  |
|  | (6.72e-05) |  | (7.12e-05) |  | (0.000166) |  |
| minfk | -1.426\*\*\* |  | -0.675\* |  | -2.323\*\*\* |  |
|  | (0.373) |  | (0.374) |  | (0.732) |  |
| lnimports\_o |  | 0.856\*\*\* |  |  |  |  |
|  |  | (0.270) |  |  |  |  |
| lnintimps\_bec\_o |  |  |  | 1.355\*\*\* |  |  |
|  |  |  |  | (0.332) |  |  |
| lnintimps\_bvsbil\_o |  |  |  |  |  | 0.560\*\*\* |
|  |  |  |  |  |  | (0.153) |
| Constant | -38.23\*\*\* | 40.88\*\*\* | -39.00\*\*\* | 61.77\*\*\* | -56.76\*\*\* | 40.17\*\*\* |
|  | (0.962) | (9.995) | (0.977) | (12.82) | (1.996) | (8.483) |
| Observations | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 |
| R-squared | 0.790 |  | 0.778 |  | 0.660 |  |
| Correctly Pred p(FTA)=FTA |  | 83.21% |  | 80.83% |  | 81.38% |
| Correctly Predicted FTA=1 |  | 57.98% |  | 60.43% |  | 54.91% |
| Correctly predicted FTA=0 |  | 93.98% |  | 89.53% |  | 92.67% |

Robust standard errors in parentheses,\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table A3.10. shows the results obtained from estimating the impact of the trade variables on the probability of an FTA being formed through an IV approach. The first step in each regression uses a cross sectional gravity model to create a set of predicted values that are inserted in a second step FTA formation equation. A justification for the use of a gravity model to estimate total trade and intermediate trade flows can be found in Lopez-Gonzalez (2012). The results confirm the positive effects of trade flows on the probability that a trade agreement is concluded between two countries. A priori, the Wald test is passed and hence the instruments should be valid (i.e. correlated with the trade flow measure). However determining whether the instruments are correlated of not with the unobserved component of the FTA formation equation is more complicated. It seems reasonable to presume that Co2 emissions do not currently influence the desirability of an agreement. Similarly the coverage of telephone lines or a government’s expenditure on health should not influence a country’s decision to engage in trade agreements. The table below shows the correlation between the instruments proposed and the new FTA measure that is the dependent variable in the estimation. It reveals that the instruments used are not statistically correlated with the outcome variable.

1. Centre for the Analysis of Regional Integration at Sussex (CARIS) and Department of Economics, University of Sussex

   Email: [j.lopez-gonzalez@sussex.ac.uk](mailto:j.lopez-gonzalez@sussex.ac.uk), [javilope@gmail.com](mailto:javilope@gmail.com)

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2. This may suggest that a) what makes good trading partners now is somewhat different from what made good trading partners in the past (i.e. changes in the economic determinants of FTAs); b) that there are changes in the political economy forces that determine the formation of agreements; or/and c) that there are new and more complex channels through which FTAs and trade interact. [↑](#footnote-ref-2)
3. Hold-ups occur when uncertainty impedes the efficient functioning of economic transactions. The customisation of inputs generates relationship specific sunk-costs which cannot be recouped when contracts are broken (i.e. incomplete contracts). Uncertainty then leads to sub-optimal levels of economic activity between countries. See Antras and Staiger (2011) Ornelas and Turner (2008) and Marcoullier (2002). [↑](#footnote-ref-3)
4. Also see Wooldridge, 2002 Chapter 15 p 484; and Greene, 2010 Chapter 9) [↑](#footnote-ref-4)
5. Bhagwati (1993) refers to these as the first and second waves of regionalism respectively. [↑](#footnote-ref-5)
6. Although the US and Canada are also participants with the 1965 Canada-US Auto Pact. This period also sees a large failure of many regional initiatives as Bhagwati (1993) suggests (i.e. Pacific Free Trade Area; North Atlantic Free Trade Area; Latin American Free Trade Area; and Latin American Integration Agreement). These never came to fruition. [↑](#footnote-ref-6)
7. Baldwin (1997) and Mansfield and Milner (1999) also argue that the concurrent rounds of multilateral negotiations play an important role in motivating this wave of regionalism. [↑](#footnote-ref-7)
8. Bhagwati (1993) also recognises that these agreements may have come as a response to the earlier wave of European integration initiatives hence lending support to Baldwin’s (1993) domino theory of regionalism. [↑](#footnote-ref-8)
9. Burfisher et al (2003) suggest that the qualitative difference between old and new agreements requires empiricists to reach further in their tools for the analysis of the impacts of agreements where in particular the links between trade and productivity require further theoretical and empirical treatment. [↑](#footnote-ref-9)
10. See Baldwin (2011) [↑](#footnote-ref-10)
11. This very proposition is tested by Orefice and Rocha (2011). They find evidence that intermediate goods trade leads to a wider demand for deeper provisions in FTAs. [↑](#footnote-ref-11)
12. Baier and Bergstrand (2004) suggest that preferential partners tend not to be distant, share similar economic mass and have small differences in factor endowments. [↑](#footnote-ref-12)
13. Egger and Larch (2008) show that the correlation coefficient of the capital-labour ratios used in Baier and Bergstrand (2004) and real GDP per capita is high (0.975). [↑](#footnote-ref-13)
14. In the appendix (A3.1), the baseline year of 1960 is used to anchor the data as was done in Baier and Bergstrand’s (2004) estimations. This is to avoid endogeneity arising from the possible impact of FTAs on the observed variables (GDP and GDP per capita). The results are qualitatively the same. [↑](#footnote-ref-14)
15. Appendix figure A.3.1 shows that these results do not change when using values of the economic variables in the year 1960. [↑](#footnote-ref-15)
16. Bergstrand et al. (2010) also identify three waves of regionalism: The first from 1958-1973; the second from 1973-1989; and the last from 1989 onwards. The choice of cut-offs in this paper is different and is, in part, motivated by the availability of data in the empirical section. Nevertheless, several robustness checks to different specification of the waves are implemented in the appendix (see Appendix A3.3. in particular Table A.3.4). [↑](#footnote-ref-16)
17. Each wave is considered separately so that agreements that were implemented during the first wave are dropped from the sample in subsequent waves. Hence an agreement between Germany and France appears only in the first wave whilst the agreement between Germany and Spain appears only in the second wave. In this way, the agreements are classified by when they occurred rather than by how long ago they were implemented. This certainly raises issues of sequencing insofar as it is possible that countries sign with more distant partners as a result of having signed with all the partners that are close by. [↑](#footnote-ref-17)
18. Agreements are identified by dyads hence the formation of the original EEC involving 6 countries means the creation of 15 ‘agreements’ (6x5=30 divided by 2 to capture dyads =15). [↑](#footnote-ref-18)
19. New agreements between ‘distant’ partners involve several key actors: the EU with Chile, Canada, Mexico and South Africa; Chile with the EU, the US, and Canada; and Singapore with the US, Switzerland, Jordan, Korea; as well as the US with Jordan. Additionally many prospective agreements are also between relatively distant partners i.e. EU and US with Korea as well as EU-GCC or MERCOSUR or indeed the Trans Pacific Agreements between ASEAN+3 and the US. This shows that the newest wave of regionalism appears to involve countries located in different hemispheres, whereas the early waves of regionalism involved North-North and some South-South agreements, the latest wave of regionalism may involve the creation of new North-South ties. See Manger (2009) for a discussion of this. [↑](#footnote-ref-19)
20. Issues of sequencing remain important. It is possible that, once regions have been formed along geographic divides, subsequent waves capture expansions of regional blocks with neighbouring countries. However, if this were the case, then one would expect to obtain a flatter distribution with a higher mean. The emergence of the ‘hump’ nearing the end of the distribution and the fact that this was also captured in Figure 1, strongly suggests that there appears to be a new trend of regionalism involving more distant economies. [↑](#footnote-ref-20)
21. Earlier FTAs tended to be between countries situated in the northern hemisphere, however the evidence presented here suggests that there might be a greater incidence of North-South agreements during the latest wave (see Manger, 2009). [↑](#footnote-ref-21)
22. Overall countries participating in the latest wave of FTAs remain a little bit more similar in income than those that do not however much less so than was reported in Figure 2 panel (2). See Appendix Figure A3.3. [↑](#footnote-ref-22)
23. If Inter-industry reallocations are seen to be pronounced then voters may have strong views against such liberalisation. [↑](#footnote-ref-23)
24. The large changes in factor rewards, as predicted by the traditional H-O-S theorems, can lead to internal frictions that garner opposition to trade agreements. Magee (2003) makes this point by showing the US House and Senate voting results for the FTA with Canada (CUSTA) versus that with Mexico (NAFTA) where the former was more easily passed than the latter. Mansfield et al. (2004:p69) argue that “adopting policies that antagonise important segments of society is ill advised”. [↑](#footnote-ref-24)
25. This is done for a subsample of 39 countries for which the value of bilateral vertical specialisation could be calculated. This indicator is calculated following the method presented in Lopez-Gonzalez and Holmes (2011). The characteristics of the sample used are discussed in the data section of this paper. [↑](#footnote-ref-25)
26. It is noted that this plot may be driven by the impact of FTAs on vertically specialised trade. It serves the purpose of illustrating some prima facie evidence of a link between these processes. [↑](#footnote-ref-26)
27. Several other important contributions to the literature are omitted for brevity. This mainly concerns the literature on the links between terms of trade and FTAs See Ethier (2007), Bagwell and Staiger (1997, 2002). Also the important contributions of Yi (1996) and Freund (2000) are not widely discussed. [↑](#footnote-ref-27)
28. See Freund and Ornelas (2010) for a comprehensive review of issues surrounding FTAs. Bhagwati, 1990, 1993 and 2008; and Bhagwati and Panagariya 1996 provide compelling arguments in favour of the stumbling block hypothesis. Burfisher et al (2003), Baldwin (2006), Estevadeordal et al (2008) propose counter-arguments. Panagariya (1999) provides a good review of the early literature and debate. [↑](#footnote-ref-28)
29. Other concerns about regionalism arise from “attention diversion” (Bergsten, 1997:p574) which suggests that resources are limited and focused on bilateral deals rather than multilateral negotiations. [↑](#footnote-ref-29)
30. Bhagwati claimed that global welfare falls as a result of regionalism compared to a multilateral alternative. This is because FTAs cause trade diversion whilst multilateral tariff cutting is only associated with trade creation. [↑](#footnote-ref-30)
31. Baldwin(2011:p20) “it may be more correct to view RTAs as general trade liberalisation schemes than as discriminatory liberalisations”. [↑](#footnote-ref-31)
32. Baldwin 2011:p26 calls this “the public-good nature of regulatory reform”. He suggests that the complexities of 21st century trade deals make it hard to discriminate as it is often hard to determine the origin of multinational nationality (i.e. services or exchanges in a world where fragmentation is rife and value added is performed in many different locations). It is still possible to discriminate against certain goods, but more complex barriers against services, procurement or investment decisions are harder to enforce. [↑](#footnote-ref-32)
33. See Freund (2000) and Ethier (1998) who argue that multilateral tariff cuts facilitate the propagation of FTAs. [↑](#footnote-ref-33)
34. in addition to possible undesirable outcomes in dispute settlements (Mansfield and Reinhardt 2003). [↑](#footnote-ref-34)
35. Baldwin (2011) shows evidence of important MFN cuts in many new emerging regions which have embraced FTAs ( South Asia; East Asia; Middle East & North Africa; and Sub Saharan Africa, Baldwin, 2011:p17). In a separate paper Baldwin (2006b) argues that the binding of tariffs, through FTAs, may also be important. [↑](#footnote-ref-35)
36. Tariffs are more likely to increasingly fall on intermediate products and this has undesirable consequences for domestic value added as suggested by the effective rate of protection logic. [↑](#footnote-ref-36)
37. It need be noted that issues regarding Rules of Origin and the overlapping nature of trade agreements will increasingly be important. It is perhaps in consolidating these that the WTO can play a strong role. [↑](#footnote-ref-37)
38. Lopez-Gonzalez and Holmes (2011) shows how Mexico witnessed an important rise in VS with respect to the US as a result of NAFTA but that subsequently Mexico has embraced intermediate imports from China. Concurrent with this is an important degree of unilateral liberalisation. [↑](#footnote-ref-38)
39. Baldwin’s quote finishes “..– it asks about the correlation of two endogenous variables driven by common factors”. [↑](#footnote-ref-39)
40. Baldwin (2011) highlights that “regionalism is a threat to the WTO’s role as a rule writer, not as a tariff cutter”. [↑](#footnote-ref-40)
41. Other notable contributions to this political economy literature can be found in Ethier (1998, 2007) and Bagwell and Staiger (1998 and 2002). A discussion of these is omitted for brevity but they place greater emphasis on the importance of controlling terms of trade in the government’s objective function. [↑](#footnote-ref-41)
42. This theoretical framework implicitly includes the impact of trade policy on the decisions to engage in an agreement (through trade creation and trade diversion and the corresponding impacts on consumer surplus, producer surplus and tariff revenue). [↑](#footnote-ref-42)
43. It incorporates Bhagwati’s third interest group. [↑](#footnote-ref-43)
44. Originally, Baldwin’s (1993) paper sought to understand the drivers of EU enlargement and hence the impact of being left out of the EU was the subject of interest, however the domino theory of regionalism can be applied in more contexts than enlargement. In fact the formation of EFTA can be seen as an attempt to balance the negative impact of being left out of the EEC. Empirical support for the domino theory of regionalism can be found in Mansfield and Reinhardt (2003), Egger and Larch (2008) and Baldwin and Jaimovich (2010)/ [↑](#footnote-ref-44)
45. Although some small and well established lobbies can retain an inordinate amount of power as seen in the EU with the Common Agricultural Policy. [↑](#footnote-ref-45)
46. Samuelson’s (2001) neat numerical example exposes the gains from complementary trade. When a country uses the products of another, produced under a greater comparative advantage, then specialisation and trade gives rise to important reductions in production costs. These act as technological ‘shocks’ that push the PPF outwards. [↑](#footnote-ref-46)
47. and more feasible as it may be easier to negotiate ‘deeper’ provisions between smaller cohorts of countries. [↑](#footnote-ref-47)
48. Antras and Staiger (2011:p2) argue that “trade policies which encourage input trade volume can substitute for the more standard contractual safeguards available in domestic transactions and can thereby help bring countries closer to the efficiency frontier”. [↑](#footnote-ref-48)
49. It may also facilitate the enforceability of private international law [↑](#footnote-ref-49)
50. Using dyadic observations complicates the identification of whether results are being driven by reporter or partner characteristics. [↑](#footnote-ref-50)
51. This is the same sample that was used in Lopez-Gonzalez and Holmes (2011) and Lopez-Gonzalez (2011) to which the reader is referred to for information on the computation of the VS indicator and the description of the gravity variables. There are then 1482 observations per year and 714 agreements in place by 2008 when considering unidirectional observations. [↑](#footnote-ref-51)
52. See Egger and Larch (2008), Baldwin and Jaimovich (2010) and Baier et al (2010) for further justifications of using Baier and Bergstrand’s (2004) model as a starting point for the analysis of the formation of FTAs. [↑](#footnote-ref-52)
53. Remembering that prices are rising in distances due to trade costs [↑](#footnote-ref-53)
54. The measure of REMOTENESS also bears similarities with measures of interdependence used in Baier et al. (2010). [↑](#footnote-ref-54)
55. BB2004 suggest that this arises from the fact that welfare gains, from an FTA, increase with similarity in the economic mass of the countries involved. [↑](#footnote-ref-55)
56. This is very convenient as K-L ratio data is notoriously hard to come by. Egger and Larch (2008) note that the correlation coefficient of the capital-labour ratios used in Baier and Bergstrand (2004) and real GDP per capita is high (0.975). Bergstrand et al. (2010) also use this measure to proxy for differences in capital-labour ratios in their analysis of the timing of FTAs. [↑](#footnote-ref-56)
57. Nevertheless the estimated coefficient of this indicator is expected to behave differently across the different waves of regionalism. [↑](#footnote-ref-57)
58. It is noted that within this category of determinants should lie the role of multilateral negotiations in the formation of new trade agreements as suggested by Mansfield and Reinhardt (2003). These are omitted in this paper. A mitigating factor is that the period under investigation only includes one round of negotiations unlike that used in Mansfield and Reinhardt (2003) [↑](#footnote-ref-58)
59. In the spirit of Grossman and Helpman’s (1995) model. [↑](#footnote-ref-59)
60. See Antras (2003) for a similar argument for normal trade in the presence of incomplete contracts [↑](#footnote-ref-60)
61. See <http://info.worldbank.org/governance/wgi/resources.htm> for a description of the database [↑](#footnote-ref-61)
62. The definitions are directly transcribed from the database documents. Missing values in the dataset are manually imputed as averages of the year before and after the missing value. This occurs for 1995, 1997, 1999 and 2001 [↑](#footnote-ref-62)
63. Two solutions present themselves; first, introduce these in individual models and determine which is most significant; or second, transform the data using principle component analysis (PCA).Several attempts were made at using PCA but it was decided to stick with individual measures. [↑](#footnote-ref-63)
64. The interactions between FTAs and measures of governance are likely to be complex and might also give rise to reverse causality. Better governance may lead to the formation of FTAs and FTAs may lead to reforms that increase governance. Orefice and Rocha (2011) touch upon this issue through their analysis of the role that intermediate goods trade plays as a determinant of the *depth* of FTAs. They also highlight how the depth of an agreement positively affects the degree of intermediate goods trade between countries. [↑](#footnote-ref-64)
65. When calculating marginal effects one needs to evaluate these at a certain point in the data. Commonly averages are chosen and deviations from these show the marginal effects. However it is hard to ascertain what a change from 0.7 to 1.7 implies, or if this constitutes a real world change in these variable, and hence hard to grasp the marginal effects of these variables on the formation of FTAs. Hence the signs of these are likely to be more revealing. [↑](#footnote-ref-65)
66. The method that they propose relies on calculating ‘multilateral indexes’ which lends itself to a simpler estimation procedures than the spatial techniques used in Egger and Larch (2008) and Baldwin and Jaimovich (2010). The nature of these indicators is not dissimilar to the multilateral resistance terms introduced by Anderson and Van Wincoop (2003). Baier et al (2010:p8 footnote 7) explain the problems associated with estimating spatial econometric models and provide compelling arguments in favour of simpler estimation methods. [↑](#footnote-ref-66)
67. Baier et al. (2010) attempt to discern which one of these is most important in driving FTA formation [↑](#footnote-ref-67)
68. This idea is derived from the literature on *tariff-complementarity* (Bagwell and Staiger 1997, 1999 and Ornelas 2005) [↑](#footnote-ref-68)
69. Derived from models of *competitive liberalisation* (Baldwin 1993 and Bergsten 1996) [↑](#footnote-ref-69)
70. This may capture a learning by doing element of negotiations [↑](#footnote-ref-70)
71. It is also possible that there are diminishing returns to this variable so a squared term can be added. If countries have signed many FTAs, the returns to an additional FTA should fall as the chances are that FTAs have already been signed with the most important trading partners. [↑](#footnote-ref-71)
72. This captures the total degree of global vertical specialisation and was expected to yield positive coefficients through similar political economy channels. [↑](#footnote-ref-72)
73. A summary table of the descriptive statistics for these variables can be found in the Appendix A3.2. [↑](#footnote-ref-73)
74. see Lopez-Gonzalez (2012) for a justification of the positive impact of FTAs on vertically specialised trade [↑](#footnote-ref-74)
75. This assumption is the same as the one made in Lopez-Gonzalez (2012). [↑](#footnote-ref-75)
76. The presence of unobserved heterogeneity in these estimations was confirmed in Lopez-Gonzalez (2012) where it was found that unobserved variables drove levels of trade and also the desirability of engaging in an FTA. [↑](#footnote-ref-76)
77. This, in part, motivated the hypothesis of this paper. [↑](#footnote-ref-77)
78. In Lopez-Gonzalez (2012), once appropriate controls were used through a set of selected FE, it was shown that current trade flows were unaffected by future trade agreements which then supported the notion that the impact that the FTA dummy variable was capturing was the impact of an FTA on VS rather than any other unobserved factor. [↑](#footnote-ref-78)
79. It can be argued that income is not exogenous as it can be affected by FTAs, but taking lagged values should resolve these issues. [↑](#footnote-ref-79)
80. The use of a gravity model to estimate intermediate imports is justified in Lopez-Gonzalez (2012). [↑](#footnote-ref-80)
81. This condition should be met by virtue of the first step. [↑](#footnote-ref-81)
82. there is no direct test which guarantees the validity of the instruments used [↑](#footnote-ref-82)
83. They suggest that the instruments used in Magee’s (2003) paper do not meet these validity criteria [↑](#footnote-ref-83)
84. This approach could be problematic if there are instances of switching out of agreements because the dFTA dependent variable would take on negative values. This is not the case in the context of the dataset used in this paper. Furthermore it is actually a very convenient way of looking at the role of the independent variables in the formation of NEW agreements as it eliminates all those agreements that are time invariant. [↑](#footnote-ref-84)
85. Honore (2002:p166) says that the incidental parameter’s problem “will typically, but not always lead to inconsistent estimation of all the parameters of the model. The problem arises when T is small. The estimates of the unobserved effect become inconsistent (even when one increases N). This inconsistency then causes biases in the estimated coefficients.” [↑](#footnote-ref-85)
86. The indicator of vertical intra-industry trade identifies the overlap between imports and exports at a certain level of aggregation (6-digits in this instance). Manger (2009) follows the traditional literature and identifies vertical flows when the difference in the unit values of the export and import flows is above a certain threshold. [↑](#footnote-ref-86)
87. Manger (2009) underlines that the changing nature of the partners that are involved in new FTAs arises from evolving features in the typology of trade which are captured by this indicator. The proliferation of FTAs between countries of different levels of development is then motivated by changes in the political coalitions that support liberalisation manifested by the rise in vertical intra-industry trade (VIIT). Manger essentially proposes a similar conceptual link between VIIT and FTAs as is made here between VS and FTAs. However, in his empirical strategy he makes no distinction between VIIT in intermediate or in final goods. It is then possible that his results are capturing different incentives to form trade agreements than those that are the concern of this paper. [↑](#footnote-ref-87)
88. Manger (2010) argues that such an approach requires undertaking a panel bootstrap so as to address the incorrect estimation of the standard errors. Additionally he suggests that this corrects for time dependence in short panels and the presence of slow moving variables (p.16). However he argues that inference in these models is likely to be ‘more conservative’ (p.17). [↑](#footnote-ref-88)
89. However, because there is no STATA routine for such an estimation, one has to pay particular care in how the standard errors are treated. Manger (2009) suggest a bootstrap method. [↑](#footnote-ref-89)
90. See Greene (2011) and Imbens and Wooldridge (2007) for a more detailed discussion of this methodology. [↑](#footnote-ref-90)
91. Wooldridge (2002) attributes this method to Chamberlain (1980) and calls it Chamberlain’s random effects probit model. [↑](#footnote-ref-91)
92. Data constraints in the calculation of right hand side variables force a considerable reduction in the temporal and country coverage of the sample when looking at the new determinants of new agreements. [↑](#footnote-ref-92)
93. A logit is chosen for comparability across results in subsequent sections. Initially a probit model was also run but it seemed to fare worse in predicting successful FTAs than the logit. [↑](#footnote-ref-93)
94. If a country signs an agreement during the first identified wave of regionalism, it is removed from the sample in subsequent estimations. In looking at the determinants of new agreements, an issue arises concerning the treatment of existing agreements. This is discussed at length in the Appendix A3.3 [↑](#footnote-ref-94)
95. As a robustness check this table is also estimated using 1970’s data. BB2004 used a baseline year of 1960 to avoid issues of endogeneity arising from the possible impact of FTAs on GDP. Their sample is also smaller and included 57 countries with a dependent variable that was equal to one if a country was part of an agreement in 1996. Robustness checks show that the results are relatively insensitive to the use of different base years. [↑](#footnote-ref-95)
96. Although it is noted that a lower predictive power is obtained in this sample than that of BB2004. They focused on agreements in 1996 so this fact may give further support to the changing determinants of FTAs during the new wave of regionalism. [↑](#footnote-ref-96)
97. This may be capturing the ‘hump’ that appeared in Figure 3. [↑](#footnote-ref-97)
98. Bearing in mind that the pseudo\_r2 is calculated as 1 minus the ratio of the log likelihood value for the estimated model and that predicted by a model with just an intercept (like in BB2004). [↑](#footnote-ref-98)
99. It is assumed that predicted PTA membership occurs when the predicted response probability (p(FTA)) is above 0.5 as in BB2004 and EL2008. The focus is placed on ‘true positives’ (i.e. correctly predicting an FTA when there is one) because correctly predicting the presence of no FTA in a sample such as this one with little incidence of FTAs is easier. In fact, if the model had no predictive powers whatsoever and predicted no FTAs, it would still correctly predict over 96% of the observations. [↑](#footnote-ref-99)
100. Another striking feature is that the determinants of the first and last wave of regionalism share more similarities with each other than with the determinants of the second wave. Whilst it would be interesting to pursue what drives these results, it is, at present, beyond the scope of this paper. [↑](#footnote-ref-100)
101. The results presented in Table 3 are robust to different specifications of the temporal coverage of the waves. In the Appendix Table A3.4 the first wave is shortened and is identified for the period 1960-1980, the second wave is then lengthened from 1981-1999 and the third wave occurs from 2000-2006. The results suggest, if anything, that the traditional determinants of FTAs are worse at predicting FTAs during this newly defined third wave. The percentage of correctly predicted FTAs falls to around 5%. [↑](#footnote-ref-101)
102. The measures are introduced individually rather than collectively to avoid multicollinearity. A principle component analysis (PCA) derived aggregate indicator was also attempted. The analysis suggested that one factor explained 85% of the variance i.e. the eigenvalue of the first factor was above 5 whereas the remaining ones were well below 1 implying that only one factor should be retained. This suggests that not much information is added through the process of aggregating these and hence it was decided that looking into the role of these measure separately would be more informative. [↑](#footnote-ref-102)
103. See section 4 of this paper for a short description of the countries used for this regression. [↑](#footnote-ref-103)
104. It need be noted that this subsample captures many of the new agreements signed during the latest wave and hence that an FTA event is more likely here than in the larger sample. [↑](#footnote-ref-104)
105. The coefficients of the traditional FTA formation variables are omitted for brevity. [↑](#footnote-ref-105)
106. In Appendix A3.4. the relationship between these measures and the probability of engaging in an FTA is further investigated where the results suggest that there might be a non-monotonic relationship between governance and FTA formation. They show that very low measures of regulatory quality are associated with lower likelihoods of FTA formation, however measures in the low-to mid range are seen to be associated with higher probabilities of an FTA being formed. [↑](#footnote-ref-106)
107. Table 5 shows that the variable POL\_STAB seems to react in a way that is counter to the predictions made. It is possible that this variable captures necessary conditions needed for value chain activity. A low value of political stability may imply very little security in economic transactions and hence reduce the probability of an FTA. [↑](#footnote-ref-107)
108. This is the same measure that exhibited magnification effects in Lopez-Gonzalez (2012). [↑](#footnote-ref-108)
109. This is in line with Orefice and Rocha’s (2011) findings. [↑](#footnote-ref-109)
110. Other estimations used the value of a country’s measure of world vertical specialisation rather than the minimum. A positive coefficient was found confirming the hypothesis that countries with a higher relative lobbying mass in favour of liberalisation are more likely to engage in trade agreements. However the predictive powers of the FTA formation equation were lower than when the minimum measure was used. These results are not reported but are available upon request. [↑](#footnote-ref-110)
111. Interestingly, when an interaction term is added between bvs intermediates and reg quality (not shown), the trade measure loses its significance and interacted term becomes significant. This may imply that the vs measure is acting through the governance measure as originally suggested by Antras and Stagier (2011). Extensions of this thesis should focus on this issue. [↑](#footnote-ref-111)
112. The choice of looking at differences with respect to the year 2000 is made on the basis that it caters for sufficient variance in the independent variables and also a low enough incidence of trade agreements. Most agreements in the sample were signed after this year. [↑](#footnote-ref-112)
113. This estimator only eliminates the problems associated with unobserved heterogeneity if the cause of these is time invariant. [↑](#footnote-ref-113)
114. These biases arise from the positive impact of FTAs on trade flows (see Lopez-Gonzalez (2012) for a justification of this assertion). Using changes in trade flows between 2008 and 1995 to predict FTA formation will not deal with these biases. Changes in trade flows during this period will be affected by the presence of an FTA and hence the coefficient on the trade measures is likely to bias upwards. To avoid these biases, the estimation should be carried out using changes in trade flows *before* the conclusion of an agreement. But because the switch into an agreement happens for different countries at different periods in time, then one has to think carefully how to treat changes in trade flows between countries that have not signed an agreement. The appendix provides a fuller discussion of these issues (see section A3.5). [↑](#footnote-ref-114)
115. Evaluated at mean values. It must be noted that a 1% change in the change in vertically specialised trade might be a relatively big change. [↑](#footnote-ref-115)
116. Although it can be argued that some new agreements have certain environmental clauses, one would be hard pressed to argue that this is a make or break condition in the formation of trade agreements (perhaps unfortunately). [↑](#footnote-ref-116)
117. This implies that, in terms of the first step equation, there is little variation in the instruments used so that all three measures could be capturing the same type of variation. A more appropriate test would require identifying instruments that singularly capture variance in each measure. [↑](#footnote-ref-117)
118. The marginal effects of the full table are presented in the Appendix A3.9 [↑](#footnote-ref-118)
119. Recall that the measure identifies country i’s weighted exports to country j’s FTA partners. [↑](#footnote-ref-119)
120. There is no evidence of a diminishing marginal utility (or return) to signing an extra agreement. Entering this measure squared shows a positive coefficient and is omitted in the results presented however the results with this measure are available upon request and do not substantially alter the above presented findings. [↑](#footnote-ref-120)
121. However it is hard to prove the validity of this statement as the indicators that are incorporated in the estimations are only available for the periods that occupy the latest wave of regionalism. A more conclusive proof of this claim would have passed through looking at the role of these variables throughout the different waves of regionalism which is unfortunately not possible. [↑](#footnote-ref-121)
122. Another problem that may arise is that the anticipation of an agreement could already be causing variables to shift. In the panel specification lags will be taken to control for this. [↑](#footnote-ref-122)
123. The severity of this incidental parameters problem falls as T rises and hence in a sample with 14 years the problem may not be as pronounced (Greene 2010). [↑](#footnote-ref-123)
124. Even though this estimation may raise incidental parameters problems, the results obtained suggest that the 14 year span of the data may have considerably reduced the undesirable consequences of such problems. [↑](#footnote-ref-124)
125. The first step estimated a model like that in equation 22 in Lopez-Gonzalez (2012) however the model is estimated without the FTA coefficient as the interest lies in predicting the amount of trade that would take place without an FTA. Very similar results emerged from running this 2 step approach with a model that uses the FTA variable in the first step. It is not entirely clear which approach is the correct method of estimation to follow. [↑](#footnote-ref-125)
126. The coefficients on the regressors capturing the averages are not reported to avoid over cluttering. [↑](#footnote-ref-126)
127. This is done for all countries that do not share an agreement in 1995. The fitted values are obtained from regressing a ‘traditional’ FTA formation equation. The R-squared is 0.084 [↑](#footnote-ref-127)
128. For some reason Stata is unable to plot the values from an LPM model with 15,000 observations so the figure uses data from 2003 to 2008 for the graph. Nevertheless the data used for the estimation of the fitted values is the entire sample. [↑](#footnote-ref-128)