Selection into and Effects of Endogenous Preferential Economic Integration Agreements*

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1 Introduction

World War II reset the world economy almost to a vacuum of economic integration. Many if not most of the bilateral and multilateral agreements granting preferential access to foreign markets – through trade in goods and services but also along dimensions beyond such transactions – were abandoned in its course. Accordingly, multilateral political and economic cooperation through the General Agreement and Trade and Tariffs (GATT) in 1949 as well as preferential integration (from the viewpoint of average GATT members) through the formation of the European Community[1] in 1958 and the European Free Trade Agreement (EFTA) in 1960 happened almost in a vacuum of integration of that kind. While the political obstacles to those agreements were big at the time, so were the economic merits – at the level of disintegration brought about by the War. At that point of history, had data on bilateral goods trade been as abundant as nowadays, the trade gains from preferential liberalization would have been almost directly attributable to the inception of those agreements.

In terms of preferential as well as non-preferential economic integration, the world has fundamentally changed since. For instance, tariffs have been substantially reduced both within GATT (now the members of the World Trade Organization, WTO) through 7 completed rounds of negotiations mainly about tariffs.[2] Nowadays, most countries apply most-favored nation tariffs negotiated under GATT not only to members of the WTO but even to non-members. This happened mostly before 1990. Moreover, the number of preferential trade agreements (both under and outside the auspices of WTO) saw a dramatic increase. As of 31 July 2010, some 474 regional (goods and services) preferential trade agreements have been notified to the GATT/WTO, of which 283 were in force. Of the $8,379$ dyads of pairs among the 129 most important economies on the planet, more than 7% entertained an agreement purely on preferential goods trade with each other and 9% had agreements on services trade (of which many accounted for goods trade regulations at the same time) in the average year between 1990 and 2005. Most of the preferential (goods or services) trade agreements in place were concluded since the 1990s. While economic research often emphasizes the role of and focuses on goods trade liberalization, neither preferential nor multilateral liberalization of goods trade happened in isolation. The foundation of the General Agreement on Trade in Services (GATS) in 1995 paved the way for liberalization of (mostly) trade and commercial presence in services which saw major steps forward not only in the documentation of the degree of liberalization of service transactions across countries and sectors in 1996 but also in the conclusion of preferential agreements about services trade. Also the latter happened mostly since the 1990s.

While liberalization of trade in goods through goods trade agreements (GTAs) and of trade in services through services trade agreements (STAs) was arguably important for ei-

[1] The early history of the European Union (then, the European Community) rests on three three pillars: the ratification of the European Steel and Coal Community (ECSC) among the BENELUX countries, France, Germany, and Italy in 1953; the European Atomic Energy Community (EURATOM) and the European Economic Community (EEC) among the members of ECSC. Both EURATOM and EEC came into force in 1958 through the Treaties of Rome.

[2] Geneva I in 1947; Annecy in 1949; Torquay in 1950; Geneva II in 1956; Dillon in 1960; Kennedy in 1964; Tokyo in 1973, and Uruguay in 1986.

ther type of trade, growth of trade has long been outpaced by the growth of multinational activity over the last three decades (see Markusen, 1995). Economic theory suggests that multinational activity induces trade in (headquarters) services which either complements (through a vertical multinational organization) or substitutes (through a horizontal multinational organization) trade in goods (see Helpman, 1984; Markusen, 1984; Markusen and Venables, 1998, 2000; Ekholm, Forslid, Markusen, 2007). Hence, GTAs are a potential driver of goods trade and STAs potentially affect services trade, but they may interact in affecting outcome through the presence of (vertical, horizontal, or more complex forms of multinationals). Two other modes of preferential liberalization directly address and affect the environment of multinationals in their foreign activity: bilateral investment treaties (BITs) specifically regulate procedures in the case of expropriation and generally influence the risk of bilateral investments; double taxation treaties (DTTs) reduce or avoid the double taxation of foreign-earned profits. By virtue of the interdependence of trade and MNE activity, these agreements may display direct or indirect effects on trade flows in goods or services. Beyond those four pillars of preferential liberalization, currency unions in a broad sense (including currency unions proper as well as currency pegs; CUAs) affect economic transactions of any considered kind (trade in goods and services as well as MNE activity) through a reduction of exchange rate risk in a quasi-preferential way.

Both normative and positive work on the one hand and both theoretical and empirical work on the other hand has recognized the role of all of these modes of preferential liberalization for long. Yet, research on these matters of integration has been conducted in an astonishingly disintegrated way. The analysis of only mostly a single mode of economic integration is symptomatic for most of the theoretical as well as empirical work available.[3] While some authors have payed specific attention to the interaction between some pairs of modes, that type of interest is typically of theoretical nature while related empirical work is not or only scarcely available.[4] It appears to be standard in quantitative work to assume that preferential agreements of the mentioned kind are concluded independently both across treatments and in time so that partial inference can inform us about their marginal impact.

Summing up, we may say that the academic approach in economics but also political

[3] In the following, we provide a highly selective list of examples of work in economics which focused on the determinants or consequences of just one mode of the mentioned five types of preferential integration agreements.

Work on the causes of agreements. GTAs-theory: Bond and Syropoulos (1996); GTAs-empirics: Baier and Bergstrand (2004); STAs-theory: Huang, Whalley, and Zhang (2009); STAs-empirics: none; BITs-theory: Egger, Larch, and Pfaffermayr (2007a,b); BITs-empirics: Egger and Pfaffermayr (2004); DTTs-theory: Davies (2003, 2004); DTTs-empirics: Egger, Larch, Pfaffermayr, and Winner (2006); CUAs-theory: Mundell (1961); CUAs-empirics: Persson (2001).

Work on the consequences of agreements. GTAs-theory: Frankel, Stein, and Wei (1995); GTAs-empirics: Baier and Bergstrand (2009); STAs-theory: Huang, Whalley, and Zhang (2009); STAs-empirics: Egger, Larch, and Staub (2010); BITs-theory: Egger, Larch, and Pfaffermayr (2004, 2007); BITs-empirics: Egger and Pfaffermayr (2004); DTTs-theory: Davies, Egger, and Egger (2010); DTTs-empirics: Blonigen and Davies (2004); CUAs-theory: Mundell (1961); CUAs-empirics: Rose (2000).

[4] For instance, Raff (2004) studied the nexus between liberalization of goods trade and taxation (not directly DTTs), and Egger, Larch, and Pfaffermayr (2007b) analyzed the interplay between preferential liberalization of goods trade and one of investments.

science to the causes and consequences of PEIAs is mostly unimodal in two ways: it focuses on one type of agreement at a time and, when assessing the consequences, considers only one outcome. The latter is potentially harmful, because we may mis-attribute effects on given outcome to certain agreements which in fact accrue to other ones, and we may miss effects altogether when isolating some outcome but ignore other affected ones. Either judgment seems to be supported by an unconditional view on the data.

– Table 1 and Figure 1 –

To shed light on this fact, let us present figures about preferential economic integration in GTAs, STAs, BITs, DTTs, and CUAs among the 124 most important economies countries in the year 2005 in Tables 1 and 2 (see the Appendix for a list of countries). First, Table 1 suggests that DTTs outnumber both GTAs and STAs by far: in our sample, more than 20% of the country-pairs operated under DTTs (including the European Union's Parent-Subsidiary Directive) and more than 11% of the pairs had GTAs or STAs. About half as many pairs had BITs and less than 3% of them had CUAs.[5] The last column of Table 1 indicates that the lion's share of these agreements took place in the 1990s and thereafter. As such, this does not cast doubt on the uni-modal approach about PEIAs taken by economists. However, Table 2 illustrates that the five modes of PEIAs are by no means mutually exclusive. Figure 1 augments the information contained in Table 1. While the numbers in Table 1 pertained to one year only, Figure 1 illustrates that there was a tremendous surge in selection into any of those agreements over the course of years in our sample.

– Table 2 –

Table 2 is organized as follows. The rows condition on an economy to have a specific agreement and the cells infer how big of a percentage of these economies had agreements as listed in the columns by 2005. For instance, the cell in the lower right corner, "*None (else)-None (else)*" indicates that about 66% of all country-pairs did not have any of the considered agreements in place. Hence, 44% had some type of agreement. The cell *STA-GTA* in the upper right corner suggests that more than 5% of all country-pairs operated under both an STA and a GTA. DTTs come relatively frequently with no other agreement whatsoever (10%), with GTAs (6%), or with BITs (5%). BITs are unlikely to overlap with GTAs and STAs (either of them less than 2%). The reason for the latter is that some GTAs and STAs reduce the risk of expropriation of foreign investors similar to BITs so that they substitute for having a BIT.

This paper aims at assessing the fundamental variables determining selection into one of at least five modes at the level of country-pairs by means of panel data for 124 economies and

[5]The definition of these variables is as follows. GTAs are customs unions, free trade areas, or what WTO refers to as preferential trade agreements, the latter being more shallow than the former ones. The source of the construction for the binary GTA variable are the WTO and the data-set collected by Egger and Larch (2008). STAs are agreements notified to the WTO that accord with Article 92 of the GATS. Information of DTTs and BITs was collected from UNCTADs online database on DTTs and BITs. The binary CUA variable was constructed on the basis of the data collected by Reinhart and Rogoff (2004) and updated.

16 years.[6] We do so by static as well as dynamic multivariate nonlinear probability models. Selection in five modes of mutually non-exclusive PEIAs spans a possible set of $2^5 = 32$ preferential treatments. Of the 32 mutually exclusive treatment combinations based on 5 PEIA modes, only 24 are aactually used in our sample of 124 economies between 1990 and 2005. For each country-pair, the untransformed selection probabilities across actually used treatments add up to less than unity in any given year. This multiple treatment approach allows us to infer the correlation of conditional selection probabilities across the 5 PEIA modes. Also, it would allow us to infer the correlation of selecting into treatments in terms of the stochastic processes of the latent variables determining the net gains from selecting into treatments.

We use the estimated probabilities for the mutually exclusive treatments that are actually used and transform them so that they add up to unity. Based on those transformed probabilities, we assess a number of questions regarding effects of PEIAs on outcome. First, we may estimate long-run responses of outcome to selection into different treatments. For this, we choose the year 2005 in order to condition on factors of selection into treatment. Considering causal effects of treatment on outcomes in that year corresponds to a long-run analysis, since we do not require outcome to respond to treatment within a certain (short) time span, but the response may have taken years if not decades. In a second step, we may isolate typical integration paths. For instance, there are to date (January 2011) only 6 STAs which liberalize ST alone without also liberalizing goods trade. In general, there is a tendency to liberalize goods trade first and services trade in the aftermath. It is less clear as to when countries liberalize foreign direct investment through BITs and DTTs relative to the implementation of GTAs and STAs. CPUs tend to be concluded after preferential access to goods markets via GTAs. We may contrast archetypal integration paths in terms of their effects on outcome with alternative integration paths. This may inform us about the *optimal* integration path on average, at least among a subset of alternatives. Moreover, our dynamic panel data approach provides for short-run versus medium-to-long-run responses to the inception of treatments. In a similar vein, it suggests how rapidly adjustment towards a new counterfactual equilibrium happens. To the best of our knowledge the scope of this analysis – regarding the considering of multiple treatments, of multiple outcomes, of the extensive as well as the intensive country margin of these outcomes, and the dynamic considerations are novel to the literature on PEIAs.

In the next section, we proceed with an eclectic overview of the literatures on individual types of PEIAs as considered here. This should help us formulating reduced-form models of portraying the net gains for countries from selecting one of the five PEIAs or a bundle thereof. Section 3 describes the econometric approach adopted in this paper. Section 4 summarizes data and presents static as well as dynamic estimation results of the multivariate selection models, while Section 5 focuses on estimates of the impact of treatments on outcomes. The last section concludes with a summary of the findings, and an Appendix provides useful information about the composition of the country sample.

[6] In some models, we even distinguish between *deep* versus *shallow* GTAs and STAs as between deep and shallow BITs.

2 The determinants of selection into PEIAs: an overview and eclectic literature review

For reasons of brevity, let us focus on PEIAs which intend to raise welfare through a stimulus of trade or foreign direct investment, here. Then, from a general viewpoint, theoretical models about the welfare effects of such PEIAs suggests that preferential agreements will display larger (local or global) welfare effects from concluding agreements where the effects on targeted outcome (trade with trade-related agreements and foreign direct investment with investment-related ones) are larger and undesired side effects (diversion of trade or investment; undesired substitution of trade in investment-related PEIAs and of FDI in trade-related ones) are smaller. Under which economic circumstances this is the case depends on the fundamental reasons for trade or investment: differences in relative factor endowments in Heckscher-Ohlin-type models; differences in technology in Ricardian models; total and relative country size, trade and investment costs, and price markups over marginal costs in new trade theory models; market structure and elasticity demand, market size, and trade and investment costs in oligopoly models of trade and investment.[7] In all such models, the feasibility of agreements depends on whether compensating transfers among the parties to negotiations about an agreement are possible or not.

Most of the empirical literature on PEIAs builds on static new trade theory models of national or multinational firm activity (such as trade or FDI). The reason for this lies in the fact that new trade theory models suggest gravity-type models of bilateral gross flows of trade or investment for which there appears to be overwhelming support by the data: the bilateral volume of trade and investment can be explained with great success by employing exporter plus importer country size (in terms of GDP) and exporter-to-importer relative country size along with measures of trade and investment costs. Relative factor endowment differences or technology differences seem much less important. Since the theory of PEIAs suggests that the same measures determining trade and FDI should determine the welfare effects of preferential agreements about reductions in tariff or non-tariff barriers to trade (such as GTAs or STAs) or investment costs (such as BITs or DTTs) larger, similarly-sized countries with higher trade or investment costs before and smaller trade and investment costs after concluding the PEIA should be more inclined towards participating than others. While three are further aspects to CUAs which relate to price volatility and economic stability, essentially the same determinants motivating GTAs or STAs and BITs or DTTs also describe the features of an optimal currency area so that they apply for tying currencies, too.

Prototypes of new-trade-theory based work on the determinants and consequences of trade-related PEIAs are Baier and Bergstrand (2002, 2004, 2007, 2009) and Magee (2003). Essentially, these authors find that, indeed, larger, more similarly sized countries with lower trade costs in the absence of political barriers to trade conclude trade-related PEIAs (in their case, GTAs) more likely, and that such agreements have the intended stimulating effect on trade. While at this point there is less systematic evidence about the causes and consequences

[7] There is another important strand of work which relates to the role of political economy factors for protection (see Rodrik (1995) for a survey. However, we will not touch upon this topic since measurement of such factors for a large cross section of countries is difficult.

of STAs, it seems that liberalization of services trade is driven by the same factors and in a similar way as goods trade liberalization (see Egger and Lanz, 2008; Francois and Hoekman, 2010).

There is evidence at both the aggregate level of investment (see Egger and Pfaffermayr, 2004) as well as the firm level (see Egger and Merlo, 2010) that BITs cause FDI. More importantly, in our context, new-trade-theory based empirical work on the causes of BITs suggests that they, akin to trade agreements, are concluded among partners which should display larger volumes of bilateral FDI in the absence of political or risk-related barriers to MNE activity. For instance, Bergstrand and Egger (2011) find that country size as well as trade and investment costs are the key drivers of the conclusion of (GTAs and) BITs. As with GTAs only, there is some role to play for relative factor endowment differences but the propensity of concluding a GTA, a BIT, or both for any country pair is largely dominated by economic size of the integrating market and by barriers to trade and investment.

The consequences of DTTs are less clear-cut for an obvious reason: on the one hand, DTTs aim at avoiding discriminatory double taxation of profits accruing to foreign direct investors which clearly should stimulate FDI; on the other hand, DTTs aim for greater transparency about domestic and foreign tax bases of national investors and intend to close loopholes in profit taxation and to reduce opportunities of tax fraud of international investors. Hence, from an investors perspective, the net stimulus on FDI is unclear (see Blonigen and Davies, 2004). However, it is still the case that DTTs are concluded more likely among such countries where bilateral FDI should be large according to new trade theory and, ceteris paribus, they tend to cause bigger volumes of bilateral FDI on average (see Egger, Larch, Pfaffermayr, and Winner, 2006).

Finally, there is broad evidence of a positive effect of tighter currency alignments for both trade (see Rose, 2000; Glick and Rose, 2002; Egger, 2008) and investment (see Goldberg and Kolstad, 1995). Moreover, countries tend to select into currency unions and pegs systematically and broadly in line with optimum currency area criteria (see Persson, 2001; Barro and Tenreyro, 2007). In new trade theory models, the latter are largely consistent with factors determining greater flows of goods, services and, eventually, factors (such as investment). Hence, on average, we should and do find CUAs being concluded more likely among large, similarly-sized countries with smaller trade (and investment) costs.

Hence, there is broad evidence of new trade theory fundamentals to matter for both trade and MNE activity such as FDI, and to drive preferential integration through the forms of GTAs, STAs, BITs, DTTs, and even CUAs. Yet, while the same fundamentals appear to be drivers of all such PEIAs, empirical research on their causes and consequences did not strive for an integrated approach in their analysis. Implicitly, the assumption has been adopted that such agreements are concluded independently of each other and that they do not influence each other's impact in determining outcome. However, we provide evidence of a tremendous overlap in the conclusion of different types of PEIAs which suggests that changes in outcome can not be trivially ascribed to one or the other type of agreement. The latter calls for a systematic multivariate analysis of selection into multiple PEIAs and their effects on outcome.

3 Some facts about PEIA membership

While Tables 1 and 2 and Figure 1 shed some light on the frequency of PEIAs and the overlap of alternative modes thereof, deeper insights can be gained from a more systematic descriptive analysis. For instance, while Table 1 and Figure 1 illustrate the probability of a randomly drawn country-pair to be engaged in one or the other agreement and Table 2 indicates the probability of a randomly drawn pair to combine one type of PEIA with another one. However, this does neither allow conclusions about typical multi-modal or single-modal combinations of PEIAs in the data nor does it provide for insights into typical patterns regarding the evolution of a country-pair's integration path. We shed light on these matters in the subsequent tables in this section.

Let us consider five modes of PTAs as discussed before, namely, GTAs, STAs, DTTs, BITs and CUAs. Moreover, let us focus on the frequency of such agreements of $N = 129$ countries with $N - 1 = 128$ countries (i.e., of $8,379$ country-pairs) over the period 1990-2006. Since some of the countries (in Central and Eastern Europe) were founded only after the beginning of observation period, this leads to $127,019 < 8,379 \cdot 17$ data points. Obviously, since PEIAs of the considered type are symmetric, one could drop half of the observations without any loss of insight. However, we will keep them since part of our interest lies in estimating consequences of PEIAs later on, and those do not have to be symmetric for two countries. Table 3 considers all $2^5 = 32$ combinations countries may use to conclude PEIAs of the considered type and accumulates units of observation across all years in the sample. Also, it sorts combinations according to their frequency in the data.

– Table 3 –

The figures in Table 3 can be interpreted as follows. First, of the 32 possibly combinations of PEIAs, only 24 actually appear in the data. Of all the combinations possible, the no-PEIA scenario (" $0-0-0-0-0-0$ ") is used most frequently. When drawing observations randomly from the data, there would be a chance of $100 \cdot 93,200/127,019 \simeq 73\%$ to draw a pair which does not grant each other's firms any form of facilitated market access of a considered kind. However, notice that no country-pair in the data uses every type of PEIA (" $1-1-1-1-1-1$ "). There are numerous reasons for why this is the case. For instance, some GTAs and STAs include investment provisions which render regulations usually formulated in BITs obsolete. Some countries adopt unilateral tax exemption for foreign-earned incomes so that concluding DTTs for reasons of double taxation relief becomes an idle strategy. Among the considered PEIAs, DTTs only or GTAs – the latter in particular in combination with some STA – are frequently used. Moreover, DTTs are often combined with BITs. Also, GTAs and STAs are frequently combined with DTTs. One of the five PEIAs is chosen in about 19% of the cases, two types of PEIAs are selected in about 6% of the cases, and three (four) combinations are selected in more (less) than 1% of the cases.

The table also provides information about switching into and out of such integration strategies in the two columns on the outer right. For instance, the table suggests that in 94 cases a pair gave up on some form of facilitated market access vi-à-vis each other country's firms and did not have any PEIA afterwards, while in $1,030$ cases country-pairs adopted some PEIA out of a non-PEIA situation. Most frequently since about 1990, pairs adopted DTTs – either DTTs only or some combination with other PEIAs (in particular, with BITs). Altogether, 1,273 pairs pursued that strategy. 574 of the included pairs adopted BITs without having ones before, again either BITs alone or some combination with other PEIAs. About 500 pairs adopted GTAs and/or STAs over the observation period and only 299 adopted some form of CUA. Moreover, country-pairs most frequently gave up on DTTs (either DTTs alone or in some combination with other PEIAs). Countries also abandon BITs quite frequently relative to other forms of PEIAs, while they rarely dissolve STAs. Hence, there is an indication of looser forms of preferential integration such as DTTs and BITs to be used but also abandoned quite frequently while deeper forms of integration through, e.g., agreements on services trade tend to be more stable. The latter is also supported by the low frequency at which CUAs are dissolved in the data.

Table 4 differentiates between deep (DGTAs) and shallow agreements on trade in goods (SGTAs) by using the typology suggested by the WTO (see also Vicard, 2008).[8] We apply a distinction of deep and shallow GTAs but leave other modes of PEIAs as defined in Table 3. The reason is that the scope of tariff line coverage of a GTA can be measured quite straightforwardly, while service trade liberalization is much more difficult to measure (see Egger and Lanz, 2008), and DTTs and BITs in most countries have a model format (see Adlung and Molinuevo, 2008, for a taxonomy of BITs), and CUAs literally target currencies only. This leaves us with 6 different modes of PEIAs and $2^6 = 64$ options for combining them in Table 4.

– Table 4 –

The figures in Table 4 suggest that more than half of the country-pairs using GTAs in our sample involve deep agreements (DGTAs). This does not mean that more than half

[8]Notice that this classification essentially builds on the notion that depth of GTAs can be measured by the extent of tariff line coverage. Yet, there are alternative ways of distinguishing between deep and shallow GTAs (and, eventually, also STAs). For instance, Horn, Mavroidis, and Sapir (2009) suggest a taxonomy which considers the extent to which some GTAs (of countries in Europe and North America) go beyond regulations specified by the WTO. While they covered only a small set of GTAs, the WTO recently extended their exercise to almost 100 important GTAs. Such a strategy can even be pursued with BITs (see Adlung and Molinuevo, 2008). We consider the Horn, Mavroidis, and Sapir (2009) approach as very informative about the scope of agreements but maybe less their depth in the sense of the degree of liberalization they bring about. However, we also admit that ours is a very crude taxonomy, too, but measuring the pure degree of liberalization even of tariffs within GTAs is difficult (see Carpenter and Lendle, 2010). In general, we do not associate the role or impact of agreements as to be measurable only in terms of the policy barrier they (at least, historically) were aimed to reduce (tariffs and non-tariff barriers for GTAs; non-tariff barriers and movement of firms and workers for STAs; double taxation for DTTs; expropriation risk for BITs; and currency volatility for CUAs), but acknowledge that such agreements may bring about benefits (or losses) which lie beyond the instruments directly targeted. Hence, we admit that many GTAs, STAs, DTTs, or BITs regulate matters beyond their original reach – for the better or the worse – and that their effects are net effects which incorporate such changes. However, we resort from using a very precise taxonomy, since it would become impossible to go beyond case study analysis in evaluating effects of PEIAs. Notice that the figures in Table 3 suggest already that some PEIA strategies and, in particular, changes thereof, occur quite infrequently. At too low frequencies of events, which would be a natural consequence of a very fine grid of distinction between different forms of PEIAs, estimation would be impossible.

of the existing GTAs (notified to the WTO or not) are deep. Notice that many DGTAs involve numerous countries (e.g., the European Union), while many SGTAs involve only two countries. Moreover, notice that our sample of countries focuses on the economically more important ones on the planet. There, DGTAs occur at greater frequency than in the rest of the world relative to SGTAs. Moreover, the figures in the table suggest that countries switch into agreements that are based on DGTAs only or in some combination with other PEIAs more frequently relative to SGTAs than they switch out of such agreements relative to SGTAs.[9]

– Tables 5 and 6 –

Tables 3 and 4 provide some insights about the frequency of switching into and out of agreements. Yet, they do not allow inference about transitions between states of preferential integration. For the case of five modes of PEIAs (as in Table 3), such transitions in the course of time between 1990 and 2005 are identified in Tables 5 and 6. Both tables are organized with all 32 treatments country-pairs may switch out of as in Table 3 in the rows. Table 5 contains 16 treatment states country-pairs may adopt in the columns and Table 6 contains the remaining 16 ones. Notice that we suppress the information about stayers in the diagonal of those transition matrices and focus on changes of treatment status in Tables 5 and 6. For instance, the top row of In Table 5 reveals that, consistent with the top row in Table 3, many country-pairs leave the state of non-integration associated with " $0-0-0-0-0$ ". From that state, country-pairs switch particularly often into one with DTTs only (" $0-0-1-0-0$ "), but they frequently switch into CUAs only (" $0-0-0-0-1$ "), STAs only (" $0-1-0-0-0$ "), or BITs only (" $0-0-0-1-0$ "). Notice that the sum of all entries in the first row of Tables 5 and 6 together corresponds to the number of switchers out of treatment " $0-0-0-0-0$ " in the first row and last column of Table 3. Moreover, the sum of all cells in the first column of Table 5 corresponds to the number of switchers into treatment " $0-0-0-0-0$ " in the first row and penultimate column of Table 3.

Tables 5 and 6 allow identifying typical histories of integration. For instance, after knowing that adoption of a DTT is a typical first step of integration, we can ask what the typical next step is. An answer to that question can be found from line 5 of Tables 5 and 6 (labeled " $0-0-1-0-0$ "). Table 5 suggests that adopting a BIT subsequent to a DTT is the typical path country-pairs pursue (160 cases with " $0-0-1-1-0$ "). According to Table 6, the second most frequent path is to implement a GTA and STA simultaneously after a DTT (49 cases with " $1-1-0-1-0$ "). According to Table 6, out of DTT-and-BIT-state " $0-0-1-1-0$ " country-pairs most frequently engage in GTA and STA simultaneously (38 cases with " $1-1-1-1-0$ ") or GTA only (17 cases with " $1-0-1-1-0$ "). Hence,

[9]DGTAs occur more frequently in the data than SGTAs. Also, both switching into and out of DGTAs occurs more frequently than for SGTAs. However, switching into treatments that involve DGTAs occurs more than 2.8 times as frequently as dissolving such agreements. By way of contrast, switching into SGTAs occurs only about 1.4 times as frequently as dissolving such agreements. This complements our conclusion from Table 3: PEIAs which entail deeper integration will be abandoned less likely than ones which entail more shallow forms of integration.

typical preferential integration paths since the early 1990s run from investment liberalization to trade liberalization. However, some country-pairs adopt the opposite strategy in that time frame by starting with a GTA (79 cases in the first row and column of Table 6) then moving on to DTTs (68 cases in row 17 of Table 6) or STAs (27 cases in row 17 of Table 6). Other patterns (especially, ones involving CUAs) are less systematic and, most importantly, the lion's share of possible transitions is not used.

Tables 5 and 6 do not only reveal typical patterns of integration paths since 1990, they also indicate that causal inference of treatment effects in a dynamic analysis is difficult due to small numbers of cases for most transitions.[10] Conversely, we should be aware that estimated effects of individual PEIAs estimated in the past quite likely attribute those to a single type of agreement where in fact they accrue to a mix of policies.

4 Empirical Methodology

Our empirical analysis involves four binary outcome variables. The determinants of each binary outcome may be estimated equation by equation using a nonlinear probability model. However, given the overlap of agreements identified in Tables 2-4, it appears unlikely that the choices about individual agreement membership are made fully independently. Therefore, it seems more plausible to estimate the choice problem about the 5 or 6 types of agreements as in Tables 3 or 4 as to be interdependent. This can be accomplished by means of a *seemingly unrelated regression* nonlinear probability model which allows modeling interdependence of the choices not only by means of explanatory variables but also in terms of unobservables captured by the disturbances. While there is a number of options, the most frequently used model for multinomial choices in empirical analysis is the multinomial logit model. However, in our case this would not only mean potentially estimating parameters of 32 or 64 equations but also to exclude equations for which treatments are not observed.[11] Therefore, we use a multvariate probit model which is based on 5 or 6 correlated equations. Let us specify the latent process for latent outcome $y^*_{B,ij,t}$ of equation (i.e., PEIA mode) B, country-pair ij and time t as a function of K explanatory variables which are collected in the $1 \times K$ vector $\mathbf{x}'_{B,ij,t}$. Let us use $\boldsymbol{\beta}_B$ to denote the $K \times 1$ vector of unknown parameters on $\mathbf{x}'_{B,ij,t}$ and $\epsilon_{B,ij,t}$ to denote the stochastic term. $y^*_{B,ij,t}$ generates an indicator variable through the function $y_{B,ij,t} = 1[y^*_{B,ij,t} > 0]$. Accordingly, we may state the model as

$$\begin{aligned} y^*_{B,ij,t} &= \mathbf{x}'_{B,ij,t}\boldsymbol{\beta}_B + \epsilon_{B,ij,t}, \quad y_{B,ij,t} = 1[y^*_{B,ij,t} > 0], \\ i &= 1, \ldots, N;\ j = 1, \ldots, N\ (j \neq i);\ t = 1, \ldots, T;\ B = 1, \ldots, 5(,6). \end{aligned} \tag{1}$$

The error terms $\epsilon_{B,ij,t}$, $B = 1, ..., 5(,6)$, are distributed as multivariate normal with zero mean and a variance-covariance matrix $\mathbf{V}$. Specific to this model is that it allows the off-diagonal

[10] If anything, a finer distinction of alternative forms of agreements as in Table 4 would only exacerbate that problem.

[11] Recall that only 24 of the 32 options in Table 3 are actually taken, and even 24 options of the 64 ones in Table 6 are unused.

elements of $\mathbf{V}$ to be correlated.

In general, we adopt the so-called Mundlak-Chamberlain-Wooldridge device (see Mundlak, 1978; Chamberlain, 1982; Wooldridge, 2002) for linear and nonlinear models to estimate (1). The latter includes averages of the time-variant explanatory variables along with the original variables in $\mathbf{x}'_{B,ij,t}$. Hence, the fixed effects are parameterized as an additively separable function of the time-variant variables. This reduces the correlation of the time-variant explanatory variables with the stochastic term to a minimum. Moreover, in some of the estimated models we follow Wooldridge (2005) in specifying dynamic probit models, but in a multivariate context. We do so by including lags $y_{1,ij,t}, \ldots, y_{5,ij,t}(, y_{6,ij,t})$ in $\mathbf{x}'_{B,ij,t}$ of any of the equations $B = 1, ..., 5(, 6)$. Since those lags are correlated with outcome of the respective equation, we also include initial conditions $y_{1,ij,1}, ..., y_{5,ij,1}(, y_{6,ij,1})$ in $\mathbf{x}'_{B,ij,t}$, as suggested by Wooldridge (2005) for single-equation probit models.

Estimation of (1) requires integration of a 5-variate or 6-variate normal. This may be accomplished with Monte Carlo integration using the Gauss-Legendre method, following Johnson, Kotz, and Balakrishnan (2000) and Craig (2008). Similarly, prediction of the propensities of participating in a particular type of PEIA and, hence, propensities of 5-modal (or 6-modal) treatments as in Tables 3-6 has to rely on Monte Carlo integration. Subsequently, such estimated propensities may then be used for estimation of static and dynamic responses of outcome to treatment by way of instrumental variable estimation, switching regression, or matching based on the propensity score. We resort to multiple treatment effect estimation (see Lechner, 2001) by radius matching, which ensures a certain quality of matching by requiring the estimated propensities of control units to lie within a specific radius around the estimated propensity of a unit with a specific treatment the control observations are matched onto. Here, we generally adopt a radius of one percent. Hence, for estimating, say, the average treatment effect of a GTA only (" $1-0-0-0-0$ ") on the treated relative to a counterfactual with no PEIA at all (" $0-0-0-0-0$ "), we compare country-pairs with treatment " $1-0-0-0-0$ " and propensity score vector $\mathbf{p}^{1-0-0-0-0}_{1-0-0-0-0}$ with units that actually got treatment " $0-0-0-0-0$ " but had propensities for getting treatment $1-0-0-0-0$, $\mathbf{p}^{0-0-0-0-0}_{1-0-0-0-0}$, which fulfill $|\mathbf{p}^{1-0-0-0-0}_{1-0-0-0-0} - \mathbf{p}^{0-0-0-0-0}_{1-0-0-0-0}| \leq 0.01\iota$, where ι is a vector of ones of proper size. We will report results which we dub long-run responses and ones which we dub short-run responses. For the former, we do not specify a time frame within which the response has to take place, while short-run responses have to take place within five years after switching into a new treatment status. Obviously, for long-run responses we can identify effects off the cross sectional variation in the data (i.e., a treatment status can be acquired and the treatment effect be realized even before the sample period) while short-run responses require us to focus on changes in treatment status within the sample period. The latter implies that we can only analyze a sub-set of treatment effects, since case numbers of changes are too small for most treatments.

5 Data

In the context of our analysis, we may distinguish three sets of data: ones underlying the binary indicator variables for PEIA status, observable variables determining multinomial

PEIA status, and ones for outcome PEIAs should affect directly.

5.1 Data on PEIA status

We collect data on PEIA status from three sources. First, information about GTAs and STAs stems mainly from the World Trade Organization's online database. We augment this information by one about GTAs that have not been notified to the WTO but are included in the data-sets of Bergstrand, Egger, and Larch (2010). We follow the WTO to classify GTAs into deep and shallow ones, where the former are customs unions and free trade areas covering many tariff lines, while the latter are preferential trade agreements that specify a small set of tariff lines (see also Vicard, 2008). Second, we use information about DTTs and BITs as made available by the United Nations Conference on Trade and Development's (UNCTAD) online data-base. Finally, we follow Reinhart and Rogoff (2004) in classifying (de facto) currency unions and currency pegs. Since their data-set ends in 2001, we extend it to subsequent years until 2005.

5.2 Data on determinants of PEIAs

Our empirical specification of the determinants of PEIAs is similar to the one in Baier and Bergstrand (2004). The reason for that is that theoretical models of trade and investment liberalization suggest that the same determinants affecting trade also affect foreign direct investment in general equilibrium, and so the same determinants driving preferential trade liberalization also drive investment liberalization (see Egger, Larch, and Pfaffermayr, 2007a,b; Egger, Larch, Pfaffermayr, and Winner, 2006; or Bergstrand and Egger, 2010).[12] Of course, this does not mean that different types of liberalization are adopted at identical configurations of fundamental observables, but that they depend on the same determinants. Hence, the observables determining selection into different modes of PEIAs in our model are the following:

- After defining $GDP_{ijt} \equiv (GDP_{it} + GDP_{jt})$, where GDP_{it} is a country's real GDP (in U.S. dollars of the year 2000), $SumGDP_{ijt}$ measures $\ln GDP_{ijt}$. According to new trade theory, both trade and foreign direct investment are ceteris paribus larger among larger countries and so should be the welfare effects of preferential trade and/or investment liberalization. Real GDP figures are taken from the World Bank's World Development Indicators.

- $SimGDP_{ijt}$ is defined as $\ln[1 - (GDP_{it}/GDP_{ijt})^2 - (GDPjt/GDP_{ijt})^2]$ and ceteris paribus is supposed to influence a country pair's propensity to preferentially integrate positively.

[12]In principal, one could include factors such as volatility of real GDP or inflation as determinants of CUAs. We have done so in an extension but the results about estimated propensities are relatively insensitive to that modification.

- $SumPOP_{ijt}$ is defined analogous to $SumGDP_{ijt}$, except that we use population numbers POP_{it} and POP_{jt} instead of GDP_{it} and GDP_{jt}, respectively. This variable is not included in previous specifications (see Baier and Bergstrand, 2004), but it seems advisable to use it, if countries differ starkly in terms of their productivity. Population figures are taken from the World Bank's World Development Indicators.

- $SimPOP_{ijt}$ is constructed akin to $SimGDP_{ijt}$ and included for the same reason as $SumPOP_{ijt}$.

- DKL_{ijt} is a measure of the difference in two countries' relative factor endowments, and it is measured as the absolute difference in the logarithm of two countries' real GDP per capita (see Egger and Larch, 2008), $|\ln(GDP_{it}/POP_{it}) - \ln(GDP_{jt}/POP_{jt})|$. While differences in real per-capita income are an imperfect measure of differences in capital-labor ratios, it is a stylized fact that these measures are highly correlated. Since per-capita income is available for many more countries and much longer time spans than (investment and) capital stock data are, we base DKL_{ijt} on them rather than capital-labor ratios which would have to be constructed by the perpetual inventory method under numerous assumptions (see Leamer, 1984). In models in the vein of Helpman and Krugman (1995) with trade but an absence of multinational firms, trade unambiguously increases with DKL_{ijt} as long as factor price equalization prevails. However, in the presence of multinational firms and if factor price equalization does not apply, DKL_{ijt} still matters for outcome (and the welfare effects of preferential trade and investment liberalization), but its impact is ambiguous.

- DKL^2_{ijt} is the squared value of DKL_{ijt} which is included since the impact of DKL_{ijt} on trade, investment, and the welfare effects of PEIAs is inherently nonlinear.

- $Distance_{ij}$ is the natural logarithm of the geographical (great circle) distance between two countries' economic centers. We use the distance variable provided by the Centre dÉtudes Prospectives et d'Informations Internationales (CEPII) through their geographical database.

- $Common\ Border_{ij}$ is an indicator variable which is unity whenever two countries share a common land border. The variable is taken from CEPII's geographical database.

- $Common\ Language_{ij}$ is an indicator variable which is unity whenever two countries share a common (official and other) language. The variable is made publicly available by CEPII.

- $Same\,Continent_{ij}$ is an indicator variable which is unity whenever two countries are located (at least partly) on the same continent. The variable is constructed on the basis of publicly available data from CEPII.

- $WTO\,Member_{ijt}$ (*one*) is a variable which is unity whenever only one country in a pair is a member of the GATT or the WTO in year t (see Egger and Nelson, 2010).

- $WTO\,Member_{ijt}$ (*both*) is a variable which is unity whenever both countries in a pair are members of the GATT or the WTO in year t (see Egger and Nelson, 2010).

- $Landlocked_{ij}$ (*one*) is an indicator variable which is unity whenever one of two countries exhibits maritime access. The variable is taken from CEPII's geographical database.

- $Landlocked_{ij}$ (*both*) is an indicator variable which is unity whenever neither one of two countries exhibits maritime access. The variable is taken from CEPII's geographical database.

- $CMonthWar_{ijt}$ is a variable which counts the number of days two countries exhibited armed conflict with each other since after World War II. The data are taken from the International Institute for Strategic Studies' Armed Confilct Database. In general, we expect long-lasting armed conflicts to destroy trust and contract viability among business partner from two countries. Hence, war destroys the basis for trade and, hence, the basis for preferential economic integration.

- $DiffYearWar_{ijt}$ counts the number of years since when two countries had the last armed conflict classified as a war with each other. The data are taken from the International Institute for Strategic Studies' Armed Confilct Database. We expect the destructive effects of war in trade and foreign direct investment as well as the propensity of preferential integration to be larger ceteris paribus for countries which had a recent conflict with each other.

- $DiffRegDur_{ijt}$ counts the absolute difference in the number of years two countries' political regimes are in office. The data are taken from Marshall and Jaggers' Polity IV database. Political scientists have found that longer regime durability and, hence, a more stable environment is prolific to trade so that we expect it to have a positive impact on preferential economic integration.

- $DiffPolFreed_{ijt}$ measures the difference in the $Polity\,2$ index, which is larger if a country's political freedom is greater. We observe that economic activity is larger ceteris paribus in and of countries which display a greater political freedom.

- $Remote_{ijt}$ measures the average distance of two countries i and j from all other countries in the sample in a given year t. Defining the great circle distance between countries i and j by D_{ij}, it measures $0.5\{[\ln \sum_{i \neq j} D_{ij}/(N_t - 1)] + \ln \sum_{j \neq i} D_{ij}/(N_t - 1)|\}]$ (see Baier and Bergstrand, 2004; and Egger and Larch, 2008), where N_t is the number of countries in the sample as of year t. $Remote_{ijt}$ varies over time since the sample of countries which are politically independent varies over time. A greater remoteness of a pair of countries ceteris paribus increases the importance of the two for each other so that we would expect it to display a positive impact on the propensity to grant each other preferential economic market access.

- $DRowKL_{ijt}$ measures the average difference in relative factor endowments of pair ij together with all other countries in the sample in a given year t. Akin to DKL_{ijt}, it is based upon the absolute log difference in real per-capita incomes (see Egger and Larch, 2008).

– Table 7 –

Standard descriptive statistics of the mentioned observables are provided in Table 7. While we will not engage in calculating and interpreting marginal effects of the observables in the multivariate probit models for the sake of brevity, information about the means and standard deviation of the included fundamentals of PEIA membership will help the interested reader to compare the magnitudes of standardized coefficients relative to each other.

5.3 Data on outcomes

We consider effects of PEIA-related treatments as summarized in Table 3 on two margins each of three outcome variables: nominal bilateral exports of goods in U.S. dollars, nominal bilateral exports of services in U.S. dollars, and nominal stocks of bilateral foreign direct investment. The two margins considered are the intensive bilateral margin of activity, where we transform each of the three variables logarithmically and only focus on log (i.e., approximately percentage) changes in outcome, and the extensive bilateral margin of activity, where we focus on changes in the propensity to trade or invest directly at the country-pair level.

– Table 8 –

Table 8 provides some basic descriptive statistics for all considered outcomes and margins of activity. Since services trade data are only available for OECD members and from 1996 onwards, the number of observations covered is much smaller than for goods trade. Similarly, data on bilateral FDI stocks are available for a much smaller sample of reporters than ones on goods trade. However, FDI stocks are zero (or investments fall short of reporting thresholds) much more often than this is the case for goods trade: less than 10% of the possible cells have positive entries across the years.[13] While almost 78% of the country-pairs display positive exports, FDI stocks are positive in only slightly more than 8% of the years and services trade is positive in less than 3% of the possible cases.

– Tables 9-11 –

Tables 9-11 summarize the average level (in logs) of positive goods exports (Table 9), services exports (Table 10), and stocks of outward FDI (Table 11) at the top of each cell and the probability of a positive outcome at the bottom. Unlike in Table 2, we add one row and one column each to single out effects of a unimodal PEIA at the bottom of Tables 9-11. For instance, the cell in the lower left corner of Table 9 suggests that positive goods trade flows in logs amounted to 1.28 for country.pairs which had a GTA only. The entries in Table 9 suggest already that GTAs might have a positive effect on goods trade, since the average level of goods exports (in logs) among countries without any PEIAs amounted to 0.38 which is lower than any other entry in Table 9. However, positive goods exports tend to be greater with DTTs or BITs alone than with GTAs alone, according to the table. Also, the probability of positive exports is lowest without any PEIA as compared to any alternative in Table 9. Yet, also that probability is higher with other unimodal PEIAs such as BITs, DTTs, or CUAs than with GTAs alone. Moreover, multimodal PEIA policies are associated with higher goods exports levels and higher probabilities of positive goods exports than unimodal ones (to see this, compare the figures in the cells at the bottom of Table 9 with the ones in the upper part of the table.

Similar patterns arise for services trade and FDI in Table 10 and 11. For instance, both the level of positive outcome as well as the probability of a positive outcome in the absence of any PEIA (in the outer right cell of the bottom row of either table) tend to be dominated by unimodal or multimodal preferential policies (in other cells of the respective tables). Moreover, multimodel PEIA strategies (in the upper part of the tables) tend to be associated with higher levels and a higher probability of positive outcome than unimodal strategies (at the bottom of the respective tables). Also services trade and FDI tend to display higher levels and probabilities of positive outcome with unimodal DTTs or BITs than with unimodal GTAs or STAs. However, for all three outcomes considered, the highest level or probability of positive outcome is associated with some multimodel PEIA that involves GTAs or STAs (see the respective columns in Tables 9-11).

While Table 9-11 are suggestive of a positive nexus between different PEIA strategies and goods trade, services trade, and FDI, they do not permit causal statements. The reason for the latter is that countries with particular characteristics that themselves cause outcome select into specific modes of PEIAs so that the unconditional mean comparisons in Tables 9-11 are prone to self-selection bias. The aim of the subsequent section is to avoid that self-selection bias by means of matching methods which estimate unobservable counterfactual

[13]Notice that we eliminate all countries from the statistics which nowhere report outward FDI in a given year or which never receive inward FDI. Hence, only countries that are potential investors or recipients of investments are included. The same is true for goods trade.

outcomes by conditioning on a set of observables so as to improve comparability between country-pairs with alternative PEIA status and reduce if not avoid the self-selection bias.

6 Estimation results

This section is structured as follows. First, we present the results of (nonlinear probability) selection models into multinomial PEIA status. Specifically, we will present static and dynamic models of self-selection. These models will provide estimates of the self-selection propensities of country-pairs into all observed states of PEIA treatment in the data. Second, we will use those propensities to compare outcomes of country-pairs with different PEIA status to each other and estimate a matrix of treatment effects, comparing different integration options with each other. Third, while we will mainly focus on long-run responses to PEIA treatment for data reasons, we are able to estimate short-run responses (within five years) by comparing outcomes of treatment switchers to ones of stayers for some treatment transitions which we have enough cases of in the data.

6.1 Estimates of multivariate probit models for self-selection into PEIAs

In this subsection, we present the results from multivariate probit models which are based on 5 (or 6) modes of PEIAs. The advantage of such models is that the do not impose the assumption of an independence of the choices taken of irrelevant alternatives (unlike, for instance, the multinomial logit model). Moreover, they do not require estimating as many parameters as other models: with K observable variables determining selection into M treatment modes requires estimating $K \cdot M$ parameters and $M(M-1)/2$ correlation coefficients for the disturbances, while the multinomial logit model requires estimating $K \cdot 2^M$ parameters.

The multivariate probit model results are summarized in Tables 12-19 and organized as follows. There are four sets of regression results: two for static fixed effects multivariate probit models (in Tables 12-15) and two for dynamic fixed effects multivariate probit models (in Tables 16-19), respectively. While the models in Tables 12-13 and 16-17 account for 5 PEIA modes the ones in Tables 14-15 and 18-19 account for 6 PEIA modes. For each set of regressions, there are two tables: the first one presents parameter estimates for the observable determinants of selection into PEIAs (Tables 12, 14, 16, and 18), the second one summarizes the correlation coefficients for the disturbances across PEIA modes (Tables 13, 15, 17, and 19).

– Tables 12-19 –

The findings with regard to self-selection into PEIA modes can be summarized as follows. First, the means of the time-variant variables are jointly significant at one percent in any one of the models.[14] This indicates that there are time invariant determinants PEIA integration is correlated with, and by pooling the selection models across time without taking care of the time-invariant unobservable variables runs at risk of parameter bias. Second, there is a significant correlation between the disturbances across PEIA modes, on average. Hence, by modeling selection into alternative PEIA modes as independent processes, one incurs a risk of parameter bias. However, that correlation can be reduced dramatically by modeling the choice problem in a dynamic rather than a static way. Yet, even then the correlation of unobserved variables across PEIA modes is not completely eliminated. Third, models which ignore dynamic adjustment processes in the selection into PEIA modes are clearly rejected against their dynamic counterparts assuming a first-order dynamic process. While we suppress the parameter estimates for the (endogenous) lagged dependent variable in Tables 14 and 18 for the sake of brevity, these parameters are positive and significantly different from zero at one percent. Also, the status of other lagged PEIA modes matters for selection into a specific PEIA. An endogeneity bias of such variables is avoided by modeling the initial condition as a function of time averages of time-variant variables and the initial state of PEIA modes (see Wooldridge, 2005).

When considering parameter point estimates, many of them are in line with earlier results from the literature considering univariate selection into PEIA modes: most of the observables included in the PEIA selection models would take on the same parameter signs in (reduced-form) gravity models of bilateral goods exports, services exports, or stocks of outward FDI. The latter suggests that those countries which have stronger trade or foreign investment relationships also tend to integrate more likely in PEIAs of one or the other form. This is in line with the argument that the benefits from integration are larger among natural integration partners, and it suggests that one should be careful with drawing firm quantitative conclusions from unconditional mean comparisons as in Tables 9-11, since they are likely masked by a self-selection bias.

The literature proposes a number of ways to assess the goodness of fit of these models. In the sciences, it is common to use Matthews' correlation coefficient (MCC) for doing so. The latter chooses a suitable cutoff value to balance the alpha and beta errors of predicting the binary PEIA modes. Denoting true positive predictions (i.e., a status of one of the respective binary indicator variable) by TP, true negative predictions by TN, and false positive and false negative predictions by FP and FN, respectively, Matthews' correlation coefficient for PEIA mode m is defined as

$$MCC_m = 100 \frac{TP_m \cdot TN_m - FP_m \cdot FN_m}{\sqrt{(TP_m + FP_m) \cdot (TP_m + FN_m) \cdot (TN_m + FP_m) \cdot (TN_m + FN_m)}}. \quad (2)$$

Notice that $TP_m + TN_m + FP_m + FN_m$ corresponds to the number of observations for any mode m. MCC_m is a compact measure of goodness of fit which is bounded in unitary space. Moreover, it provides guidance for selection of a proper probability cutoff value at

[14]Notice that not all of the results are comparable with earlier work. For instance, we include measures of country size in terms of GDP as well as population. Hence, the measures relating to GDP, conditional on population size, reflect an impact of total (average) and relative (similarity of) productivity, while population reflects country size itself. Other authors such as Baier and Bergstrand (2004) did not include both measures together, but the parameter estimates suggest that either of them should be included in the empirical model.

and above which we associate probabilities as to suggest a prediction of a binary indicator value of one (positive) and below which we associate them with a zero value (negative). At the cutoff value which maximizes MCC_m, the level of MCC_m indicates the goodness of fit of the estimated models, akin to an R^2 in linear regressions. For computation of MCC_m, we have to employ the m-specific vector of estimated probabilities for selection into the m-th PEIA mode. Akin to the parameter estimates, those probabilities have to be simulated by Monte Carlo methods. We do so for each mode in the sequel, focusing on results which are based on a distinction of 5 rather than 6 modes of PEIAs.

Table 20 summarizes the results for MCC_m across the four estimated models in Tables 12-19. In that table, we provide for each PEIA mode and model based on 5 PEIAs both the maximum attainable level of MCC_m and the probability cutoff level at which it materializes (the latter in parentheses).

– Table 20 –

The table suggests the following conclusions. First, the vallues of MCC_m are quite high already for the static models and even higher for the dynamic ones. In general, the predictive power is lowest for CUAs in both the static and dynamic models, and it is highest for BITs in the static model and for STAs in the dynamic model. For multivariate binary choice models, the predictive power of the dynamic 5-PEIA framework is excellent. Notice that, provided the great variability of the frequency of events across PEIA modes, the highest attainable predictive power as captured by MCC_m is reached at rather different mode-specific probability cutoff values. However, MCC_m is rather stable in a fairly large neighborhood around the optimal cutoff level. For instance, for the dynamic models, MCC_m does not change by more than one percentage point within a symmetric interval of 50 percentage points in probability space around the optimum cutoff probabilities.

Notice that the model estimates can not only be used to predict probabilities of adopting any one out of the 5 modes of PEIAs, but they can also be used to predict the response probabilities of all 2^5 options of combining those modes. Denote the latter as p^{τ}_{ijt} where superscript τ indicates a treatment such as such as " $1-1-0-1-0$ " or " $0-0-0-0-0$ " and the subscript indexes country-pair ij and year t. Recall from Table 3 that some treatment options are unused empirically during the sample period,[15] while the estimated models will yield a positive probability mass for them. Hence, to ensure that the estimated probabilities sum up to unity across all actually used options, we rescale the estimated probabilities for treatments by distributing the estimated ones of unused treatments across all used treatments proportionately to the relative probability mass. For that, let us introduce an indicator function I^{τ}_{ijt} which is unity whenever a treatment is actually used in t and zero else. Then, we obtain rescaled probabilities of selecting into treatment τ as $\widetilde{p}^{\tau}_{ijt} \equiv p^{\tau}_{ijt}\frac{\sum_{\tau} p^{\tau}_{ijt}}{\sum_{\tau} I^{\tau}_{ijt} p^{\tau}_{ijt}}$. Then, we may use $\widetilde{p}^{\tau}_{ijt}$ to estimate the unobserved outcome for counterfactual treatment, say, χ, and determine the treatment and control groups based on the vectors $\mathbf{p}^{\tau}_{\chi}$ as specified in Section 4, where χ may be equal to τ or not.

[15] Those are " $0-1-0-1-1$ ", " $0-1-1-0-1$ ", " $0-1-1-1-1$ ", " $1-0-0-1-1$ ", " $1-0-1-0-1$ ", " $1-0-1-1-1$ ", " $1-1-0-1-1$ ", and , " $1-1-1-1-1$ " in Table 3.

6.2 Estimates of treatment effects PEIAs

While the vector $\mathbf{p}^{\tau}_{\chi=\tau}$ determines the propensity of receiving treatment τ for those units that actually got treatment τ conditional on the observables included in the multivariate probit models, $\mathbf{p}^{\tau}_{\chi\neq\tau}$ determines the propensity of receiving treatment τ for control units conditional on the observables. We enforce two conditions for the quality of matching – i.e., the construction of the control group: first, $p^{\tau}_{\tau,ijt}, p^{\tau}_{\chi\neq\tau,ijt} \in [\max(\min_{ij} p^{\tau}_{\tau,ijt} \min_{ij} p^{\tau}_{\chi\neq\tau,ijt}), \min(\max_{ij} p^{\tau}_{\tau,ijt} \max_{ij} p^{\tau}_{\chi\neq\tau,ijt})]$, which is referred to as the common support condition; second, that all elements in $\mathbf{p}^{\tau}_{\chi\neq\tau}$ which are actually matched onto (i.e., are considered suitable control observations for) elements in $\mathbf{p}^{\tau}_{\tau}$ lie within a one-percentage point radius around the estimated elements in $\mathbf{p}^{\tau}_{\tau}$. Then, the average difference in outcomes between the matched units with actual treatment τ and those with actual treatment $\chi \neq \tau$ is an average treatment effect of the treated (ATT). Notice that the long-run ATT allows matching across all years t and country-pairs ij, irrespective of when country-pairs received actual treatment. Since usable case numbers are much smaller then and short-run effects for only a few treatments can be identified, we discuss short-run estimates of ATT in the subsequent subsection as an extension.

To assess long-run effects of PEIAs on outcome, we focus on data of 2005. Hence, matching ensures data treated observations of 2005 are matched onto ones of the same year, but we disregard any time structure in the acquisition of treatment status. The matching results are presented in Tables 21-30. There are three pars of results: Tables 21-24 refer to goods exports; Tables 25-27 pertain to services exports; and Tables 28-30 consider stocks of outward FDI as an outcome. While tables with odd numbers focus on the extensive country-pair margin (i.e., effects on the probability of conducting any positive activity), ones with even numbers address the intensive country-pair margin (i.e., effects on log aggregate bilateral activity). We focus on such treatments only where the treatment group contains at least 50 observations (country-pairs) after matching. Hence, there are fewer treatments considered in Tables 21-30 than in Table 3. We summarize the results in Tables 21-30 for each outcome separately.

– Tables 21-30 –

Tables 21-24 suggest the following conclusions with regard to long-run responses of goods trade to PEIA membership. First of all, PEIA integration affects the propensity of trading goods at all positively. This insight is based on the content of Tables 21-22. It is the case that, on average, having any kind of PEIA renders exporting goods more likely than in the absence of any PEIA. For instance, to see this, consider the positive ATT estimates in the first column and (the negative value of) the ones in the first row of Table 21 and Table 22, respectively. On average, having one type of PEIA of any kind raises the probability of goods exports by almost 10 percentage points. However, having two, three, or four types of PEIAs of any kind does not lead to a higher marginal impact of the average propensity to trade. CUAs – alone or in combination with other modes of PEIAs – have the highest positive impact on the propensity to export goods (they alone or in combination with other PEIAs raise it by almost 20 percentage points on average). On average, STAs – alone or in combination – have the smallest impact on the propensity to export goods (namely, one of about 7 percentage points). The reason is that such agreements tend to be concluded likely when countries already trade goods with each other. On average, in comparison to less PEIAs, more PEIAs – no matter how many – raise the propensity to export goods bilaterally by about 4 percentage points. According to Table 23 and Table 24, PEIAs also affect the level of goods trade positively. The average ATE across all cells in the respective tables measured as a log difference between observed and counterfactual goods exports amounts to almost 2.7 when considering experiments that imply greater integration in terms of the number of PEIAs concluded. This implies a large preferential integration-induced boost of goods exports. However, recall that this is along-run effect which may take years if not decades to materialize.

Tables 25-26 indicate that PEIA integration also affects the propensity of trading services at all in a positive way, even more so than goods trade. The reason for that outcome must be that services trade faces more political barriers than goods trade does in the observation period. On average, having any kind of PEIA renders exporting services more likely than in the absence of any PEIA. This can be seen from the average ATT (i.e., the corresponding ATE) across all cells in the first column in Tables 25 and26 and (the negative value of) the ones in the first rows of Tables 25 and 26. We may refer to this again as an average treatment effect (ATE). On average, having one type of PEIA of any kind raises the probability of services exports by about 5 percentage points. However, having two, three, or four types of PEIAs of any kind is associated with a higher ATE for the extensive margin of services trade. Having any PEIA as compared to none is associated with an average ATE of about 31 percentage points. Notice that DTTs and BITs, which are supposed to directly stimulate investment activity, have an even larger impact on the extensive margin of services trade than GTAs or STAs have. This is different from goods exports, where GTAs and STAs had a larger impact on outcome than DTTs or BITs did (for this, compare the average entry in the first columns in Tables 21-2 with those in Tables 25-26 for different PEIA modes). The reason for this outcome may lie in the closer nexus between foreign investments and services trade (e.g. through trade in headquarters services, royalty payments, and profit repatriation) in comparison to the one of foreign investments and goods trade.

Tables 28-30 support the view that FDI reacts more sensitively on average to deeper integration as measured by a larger number of PEIAs. First, akin to goods and services exports, outward FDI rises in response to preferential market liberalization by any mode of PEIA on average. It turns out that implementing one PEIA of any type when having none ex ante results in a response of the probability of positive outward FDI which amounts to about 8 percentage points and, hence, is almost as large as the response of goods exports. However, the extensive country-pair margin of outward FDI responds much more positively to having more than just one type of PEIAs in place than goods trade does. In that regard, services trade and outward FDI behave much more similarly than any of them compares with goods trade. Second, it turns out that BITs and STAs are most important to outward FDI relative to GTAs, DTTs, or CUAs. The later are the least important for FDI among the considered PEIAs, which is consistent with the interpretation that multinational firms have opportunities to hedge against currency risks which renders them less exposed to exchange rate volatility shocks than national players. There are less insights to be gained from the analysis of the response of the intensive margin of outward FDI to PEIAs as compared to exports of goods or services. The reason is that there is less variation in integration patterns among country-pairs with positive bilateral FDI than there is for trade in goods or services. However, Table 30 suggests that deeper integration in terms of a larger number of types of PEIAs in place induces additional FDI as compared to a more shallow integration.

It turns out to be insightful to compile the information contained in Tables 21-30 in a somewhat different way. In particular, we may compute average treatment effects (ATEs) which correspond to a larger number of PEIAs (of any kind) as compared to a smaller number of PEIAs. Such ATEs are defined as the weighted average of cells in Tables 21-30 across ATTs for larger numbers of PEIA modes in place for the Treated than for the Controls. Then, we may compare ATEs of any number of PEIA modes up to 4 with ones of any number of fewer PEIA modes. Such ATEs are presented for the extensive margin of activity in Table 31 (which is based on Tables 21-22, Tables 25-26, and Tables 28-29) and for the intensive margin of activity in Table 32 (which is based on Tables 23-24, Table 27, and Table 30). We may summarize the content of those tables in the following way.

– Tables 31-32 –

First of all, Table 31 suggests that positive services trade and foreign direct investment react more sensitively to deeper integration than goods trade does. This can be seen when comparing rows corresponding to ATEs for more types of PEIAs in treatments to ones in the same columns with less types of PEIAs in Table 31. Services trade and foreign direct investment behave more similarly than services trade and goods trade or foreign direct investment and goods trade with regard to responses at the extensive margin to numbers of PEIA modes in place as a measure of deeper integration. However, Table 32 suggests that this is less clear-cut for the intensive margin of activity, where goods trade reacts positively to deeper integration measured in the proposed way, while the findings for services trade and foreign direct investment are not clearly monotonic. However, the latter may have to do with the numerous missing values of bilateral outcome at the intensive margin, so that the corresponding ATEs can not be measured at sufficiently great precision.

6.3 Extensions

The short-run ATT is estimated from a sub-sample of observations which (i) actually received treatment $\chi \neq \tau$ either at the beginning or some time during the sample period but switched from that status into one of τ and (ii) that of comparable (matched) stayers in treatment status $\chi \neq \tau$ within the same time frame. Then, we compare average outcome between switchers into τ over a short period of time (within five years) after receiving treatment τ with that of the (matched) stayers. We estimate short-run responses to treatment following Abbring and Heckman (2007), based on dynamic multivariate choice models and dynamic matching on the string of propensity score of treated and counterfactual country-pairs prior to (new) treatment. We can summarize the findings as follows.

– Tables 33-35 –

At this point, we consider impacts of changes of treatment in period t in period t, $t+1$ and $t+2$. Tables 33-35 summarize short-run ATTs for a number of important treatments in the data. In each table, we summarize findings for the extensive and intensive margins of goods exports, services exports, and stocks of outward FDI. The tables provide the ATT in the first column, the underlying treatment switch in the second column, the number of treated units behind that change in a third column, and the outcome variable the ATT refers to in the last column. The results are abundant so that we will focus on only a few. What stands out as a result is that there are strong and immediate positive responses of the goods trade and FDI at the intensive margin to CUAs (see Table 33). On average, even stronger positive short-run ATTs occur in response to GTAs alone (see the upper bloc of Table 35) or GTAs in combination with STAs (see the lower bloc of Table 35). Quite strong ATTs are also found for DTTs (see the upper bloc of Table 34). However, positive responses of implementing a BIT on top of a DTT display effects at the intensive margin only after one to two years (see the lower bloc of Table 34). Large positive short-run effects at the extensive margin of outcome are primarily found if PEIA modes are combined with each other. For instance, combining DTTs with GTA and STA leads to short-run responses at the extensive margin of services exports and outward FDI in the double-digit percentage changes, according to the lower bloc of Table 35.

– Tables 36-38 –

Notice that we have focused on the adoption of single treatments in Tables 33-35. In reality, some treatment changes occur in sequences. Tables 33-35 report typical sequences of treatment combinations that occur within the data. Notice that such sequences render it difficult if not impossible to attribute treatment effects to individual switches in a combination. The reason is that most treatments take time until the full-blown response in outcome is realized so that the consequences of overlapping adjustment periods do not allow to disentangle effects. According to Table 33, 59 country-pairs that had no PEIA at all in advance adopted a DTT and shortly after that a BIT, and 49 country-pairs adopted a BIT and shortly after that a DTT. Similarly, 49 country-pairs without any PEIA in advance implemented a GTA and subsequently a DTT. While it is somewhat less common to implement three rather than two modes of PEIAs in a short time span, such strategies occur in the data as well. For instance, according to Table 34, 9 country-pairs without any PEIA implemented a BIT, then a DTT, and shortly afterwards a combined GTA and STA. According to Table 35, implementation of four PEIA modes in a row happens, but quite infrequently. We will shed light on the impact effects of such changes in subsequent work.

7 Conclusions

This report provides a novel analysis of preferential economic integration agreements (PEIAs) on economic outcome. We consider five modes of PEIAs: goods trade agreements (GTAs), services trade agreements (STAs), double taxation treaties (DTTs), bilateral investment treaties (BITs), and currency unions as well as currency pegs (CUAs). Rather than assuming that individual types PEIAs happen in isolation, we consider them jointly, allowing countries to choose from a menu of options to combine PEIAs or use them in isolation. In a broad descriptive analysis we unveil typical integration patterns of economies. Using PEIAs in isolation appears to be a rare strategy. For instance, DTTs are frequently used with BITs and their joint implementation typically happens within short time spans. Similarly, STAs are often combined with GTAs. Moreover GTAs and STAs are also quite commonly combined with DTTs, and if BITs are not concluded together with GTAs, STAs, and DTTs, it is the case because GTAs and STAs provide for regulations that substitute for the content of model BITs. CUAs appear to be used in a somewhat more idiosyncratic way, probably because they are not only implemented according to optimum currency criteria but also to prevent bigger crises in small economies for a limited time span.

The considered PEIAs obviously address not only goods trade but also trade in services as well as foreign direct investment. Again, it is a shortcoming of existing research to consider only one of those outcomes at a time. Such a strategy is misleading to the extent that the three mentioned outcomes go hand in hand not only because of the engagement of multinational firms in goods trade (their engagement ion services trade is natural due to the supply of headquarters services within multinational networks), but also due to complementarities of such activities by way of information exchange about markets and contracts cross (exporting and foreign investing) firms in the same parent country.

Indeed, we find that singular and combined PEIAs trigger positive effects not only on single outcome but typically on all outcomes. Hence, it appears beneficial to countries to think about PEIAs as a menu from which they should choose combinations so as to maximize the effects on outcome given their comparative advantage. For most developed countries, liberalizing trade not only of goods but of services seems beneficial along with an implementation of DTTs (and BITs, if trade agreements do not provide for an equivalent protection of foreign investors), since multinational firms headquartered there are relatively important to the domestic economy. Positive effects of PEIAs are relatively large in the long run. They may be large at the intensive margin of activity even in the short run, especially, if complementary PEIAs are combined with each other.

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Appendix

Tables

Table 1: Descriptive Statistics about PEIAs

	Mean	Std. Dev.	Min.	Max.
GTA	0.077	0.266	0	1
STA	0.090	0.286	0	1
DTT	0.140	0.347	0	1
BIT	0.042	0.200	0	1
CUA	0.023	0.149	0	1

Notes: 127,019 observations for 1990-2005 and 8,379 country-pairs. Means reflect average frequencies as fractions of all observations. GTAs are Goods Trade Agreements; STAs are Services Trade Agreements; DTTs are Double Taxation Treaties; BITs are Bilateral Investment Treaties; and CUAs are Currency Union Agreements which include unions with one currency as well as currency pegs.

Table 2: A Snapshot of PEIA Overlap (All Years and Country-Pairs)

Countries with/and	GTA	STA	DTT	BIT	CUA
GTA	1	.	.	.	.
STA	0.299	1	.	.	.
DTT	0.168	0.072	1	.	.
BIT	0.030	0.004	0.375	1	.
CUA	0.117	0.064	0.110	0.024	1

Notes: 127,019 observations for 1990-2005 and 8,379 country-pairs. Means reflect average frequencies as fractions of all observations with a PEIA in the given row. GTAs are Goods Trade Agreements; STAs are Services Trade Agreements; DTTs are Double Taxation Treaties; BITs are Bilateral Investment Treaties; and CUAs are Currency Union Agreements which include unions with one currency as well as currency pegs.

Table 3: Being in, Switching Into, and Switching Out of PEIA Treatments

PEIA treatments					Observations	Switchers	Switchers
GTA	STA	DTT	BIT	CUA	(total)	into	out of
0	0	0	0	0	93,200	94	1030
0	0	1	0	0	10,005	544	299
0	1	0	0	0	7,093	139	41
1	0	0	0	0	4,345	111	102
0	0	1	1	0	3,319	275	86
1	1	0	0	0	1,631	54	45
0	0	0	0	1	1,444	143	89
1	1	1	0	0	1,207	104	38
1	0	1	0	0	1,136	83	27
0	0	0	1	0	1,003	124	111
1	1	1	0	1	534	59	2
0	0	1	0	1	421	47	42
0	1	1	0	0	407	24	14
1	1	1	1	0	262	65	0
1	0	0	0	1	216	6	27
1	0	1	1	0	197	35	12
0	0	1	1	1	171	24	2
0	1	1	1	0	95	13	2
1	1	0	1	0	78	14	5
1	0	0	1	0	73	9	5
0	1	0	1	0	70	11	5
1	1	0	0	1	64	15	13
0	0	0	1	1	40	4	0
0	1	0	0	1	8	1	1
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	0
0	1	1	1	1	0	0	0
1	0	0	1	1	0	0	0
1	0	1	0	1	0	0	0
1	0	1	1	1	0	0	0
1	1	0	1	1	0	0	0
1	1	1	1	1	0	0	0
					127,019	*1,998*	*1,998*

Notes: 127,019 observations for 1990-2005 and 8,379 country-pairs. GTAs are Goods Trade Agreements; STAs are Services Trade Agreements; DTTs are Double Taxation Treaties; BITs are Bilateral Investment Treaties; and CUAs are Currency Union Agreements which include unions with one currency as well as currency pegs.

Table 4: Being in, Switching Into, and Switching Out of PEIA Treatments (Distinguishing Deep and Shallow GTAs

PEIA treatments						Observations	Switchers	Switchers
DGTA	SGTA	STA	DTT	BIT	CUA	(total)	into	out of
0	0	0	0	0	0	93,200	94	1030
0	0	0	1	0	0	10,005	544	299
0	0	1	0	0	0	7,093	139	41
0	0	0	1	1	0	3,319	275	86
1	0	0	0	0	0	2,055	71	51
0	1	0	0	0	0	1,973	19	45
0	0	0	0	0	1	1,444	143	89
0	0	0	0	1	0	1,003	124	111
1	0	0	1	0	0	791	58	14
1	0	1	1	0	0	787	81	31
1	0	1	0	0	0	724	26	29
0	1	1	0	0	0	703	19	15
1	0	1	1	0	1	534	59	2
0	0	0	1	0	1	421	47	42
0	0	1	1	0	0	407	24	14
0	1	1	1	0	0	362	19	7
1	1	0	0	0	0	317	26	11
0	1	0	1	0	0	283	22	14
1	1	1	0	0	0	204	10	2
1	0	1	1	1	0	188	52	0
0	0	0	1	1	1	171	24	2
1	0	0	1	1	0	161	29	11
1	1	0	0	0	1	126	21	21
0	0	1	1	1	0	95	13	2
0	1	0	0	0	1	84	0	21
0	1	1	1	1	0	72	13	1
0	0	1	0	1	0	70	11	5
1	0	0	0	1	0	69	8	4
1	0	1	0	0	1	64	15	13
1	1	0	1	0	0	62	5	1
1	1	1	1	0	0	58	4	0
1	0	1	0	1	0	57	10	3
0	0	0	0	1	1	40	4	0
0	1	0	1	1	0	28	5	1
0	1	1	0	1	0	21	4	2
0	0	1	0	0	1	8	1	1
1	1	0	1	1	0	8	1	0
1	0	0	0	0	1	6	6	6
0	1	0	0	1	0	4	1	1
1	1	1	1	1	0	2	1	0
0	0	1	0	1	1	0	0	0
0	0	1	1	0	1	0	0	0
0	0	1	1	1	1	0	0	0
0	1	0	0	1	1	0	0	0
0	1	0	1	0	1	0	0	0
0	1	0	1	1	1	0	0	0
0	1	1	0	0	1	0	0	0
0	1	1	0	1	1	0	0	0
0	1	1	1	0	1	0	0	0
0	1	1	1	1	1	0	0	0
1	0	0	0	1	1	0	0	0
1	0	0	1	0	1	0	0	0
1	0	0	1	1	1	0	0	0
1	0	1	0	1	1	0	0	0
1	0	1	1	1	1	0	0	0
1	1	0	0	1	0	0	0	0
1	1	0	0	1	1	0	0	0
1	1	0	1	0	1	0	0	0
1	1	0	1	1	1	0	0	0
1	1	1	0	0	1	0	0	0
1	1	1	0	1	0	0	0	0
1	1	1	0	1	1	0	0	0
1	1	1	1	0	1	0	0	0
1	1	1	1	1	1	0	0	0
						127,019	*2,028*	*2,028*

Notes: 127,019 observations for 1990-2005 and 8,379 country-pairs. DGTAs are Deep Goods Trade Agreements; SGTAs are Shallow Goods Trade Agreements; STAs are Services Trade Agreements; DTTs are Double Taxation Treaties; BITs are Bilateral Investment Treaties; and CUAs are Currency Union Agreements which include unions with one currency as well as currency pegs.

Table 5: Typical Paths for Switching into Treatment

in / out	00000	00001	00010	00011	00100	00101	00110	00111	01000	01001	01010	01011	01100	01101	01110	01111
00000	0	141	114	0	516	3	21	0	135	0	0	0	0	0	0	0
00001	60	0	0	1	2	11	0	0	0	1	0	0	0	0	0	0
00010	1	0	0	3	1	0	86	0	0	0	0	0	0	0	0	0
00011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00100	30	0	3	0	0	33	160	0	0	0	0	0	5	0	0	0
00101	0	2	0	0	16	0	0	9	0	0	0	0	0	0	0	0
00110	1	0	7	0	7	0	0	15	0	0	0	0	0	0	1	0
00111	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
01000	0	0	0	0	0	0	0	0	0	0	11	0	19	0	1	0
01001	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
01010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
01011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01100	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6	0
01101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
10001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10100	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
10101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10110	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
10111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11000	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
11001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 6: Typical Paths for Switching into Treatment Cont'd

in / out	10000	10001	10010	10011	10100	10101	10110	10111	11000	11001	11010	11011	11100	11101	11110	11111
00000	79	0	0	0	2	0	0	0	13	0	0	0	5	1	0	0
00001	2	6	0	0	0	0	0	0	0	6	0	0	0	0	0	0
00010	0	0	6	0	0	0	0	0	0	0	11	0	0	0	3	0
00011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00100	0	0	0	0	13	0	1	0	0	0	0	0	49	5	0	0
00101	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0
00110	0	0	0	0	0	0	17	0	0	0	0	0	0	0	38	0
00111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01000	0	0	0	0	0	0	0	0	9	0	0	0	1	0	0	0
01001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01100	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0
01101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
01111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	0	0	3	0	68	0	0	0	27	0	0	0	1	0	0	0
10001	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10010	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0
10011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10100	3	0	0	0	0	0	13	0	0	0	0	0	9	0	0	0
10101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
10111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11000	0	0	0	0	0	0	0	0	0	8	2	0	31	2	0	0
11001	0	0	0	0	0	0	0	0	1	0	0	0	0	12	0	0
11010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
11011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11100	0	0	0	0	0	0	0	0	4	0	0	0	0	24	10	0
11101	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
11110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 7: DESCRIPTIVE STATISTICS FOR DETERMINANTS OF PEIA MEMBERSHIP

	Mean	Std. Dev.	Min.	Max.
SumGDP_{ijt}	11.94	1.50	7.03	16.56
SimGDP_{ijt}	-.527	1.39	-9.08	.693
SumPOP_{ijt}	10.45	1.19	6.83	14.69
SimPOP_{ijt}	-.292	1.07	-7.19	.693
DKL_{ijt}	1.30	.915	0	4.31
DKL^2_{ijt}	2.52	3.02	0	18.55
Distance_{ij}	8.66	.788	4.09	9.89
Common Border_{ij}	.023	.151	0	1
Common Language_{ij}	.118	.323	0	1
Same Continent_{ij}	.224	.417	0	1
WTO Member_{ijt} (one)	.590	.492	0	1
WTO Member_{ijt} (both)	.352	.477	0	1
Landlocked_{ij} (one)	.316	.465	0	1
Landlocked_{ij} (both)	.037	.188	0	1
CMonthWar_{ijt}	12.09	274.56	0	14,986
DiffYearWar_{ijt}	.308	3.64	0	125
DiffRegDur_{ijt}	27.77	26.65	0	100
$\text{DiffPolFreed}_{ijt}$	7.64	6.16	0	20
Remote_{ijt}	8.67	.340	6.37	9.70
DRowKL_{ijt}	1.03	.498	.002	2.92

Notes: 127,019 observations for 1990-2005, 8,379 country-pairs, 129 countries.

Table 8: DESCRIPTIVE STATISTICS FOR OUTCOME VARIABLES (ALL YEARS AND AVAILABLE COUNTRY-PAIRS)

	Mean	Std. Dev.	Observations
Goods trade	.751	4.12	98,899
P(goods trade>0)	.779	.415	127,019
Services trade	3.99	2.35	3,548
P(services trade>0)	.029	.169	120,964
FDI stocks	3.76	3.53	10,538
P(FDI stocks>0	.083	.276	126,859

Notes: Observations differ across outcomes due to the availability of goods trade (from United Nations' World Trade Database), services trade (from OECD's Online Services Trade Database), and stocks of foreign direct investment (from UNCTAD's Foreign Direct Investment Statistics Online Database).

Table 9: Goods Trade Inside and Outside of PEIAs (All Years and Available Country-pairs; Extensive Margin in % Below Intensive Margin in Logs)

Countries with/and	GTA	STA	DTT	BIT	CUA	None
GTA	.	.	.	.	.	.
	.	.	.	.	.	.
STA	4.75	.	.	.	.	.
	98.20	.	.	.	.	.
DTT	5.67	6.17	.	.	.	.
	99.37	99.32	.	.	.	.
BIT	5.94	6.22	5.57	.	.	.
	100.00	100.00	98.76	.	.	.
CUA	5.80	7.20	6.42	5.721	.	.
	98.77	98.35	99.64	100.00	.	.
None	1.28	-.09	4.12	4.81	1.25	-.38
	89.04	89.48	98.16	96.41	97.23	71.55

Table 10: Services Trade Inside and Outside of PEIAs (All Years and Available Country-pairs; Extensive Margin in % Below Intensive Margin in Logs)

Countries with/and	GTA	STA	DTT	BIT	CUA	None
GTA	.	.	.	.	.	.
	.	.	.	.	.	.
STA	5.93	.	.	.	.	.
	17.27	.	.	.	.	.
DTT	5.73	5.90	.	.	.	.
	20.91	24.30	.	.	.	.
BIT	4.33	4.72	4.09	.	.	.
	31.97	26.73	23.86	.	.	.
CUA	6.10	6.10	5.48	3.41	.	.
	36.49	49.01	33.21	29.38	.	.
None	3.11	.	4.42	4.14	2.34	2.26
	.52	.	9.52	10.63	4.35	.98

Table 11: FDI Stocks Inside and Outside of PEIAs (All Years and Available Country-pairs; Extensive Margin in % Below Intensive Margin in Logs)

Countries with/and	GTA	STA	DTT	BIT	CUA	None
GTA	.	.	.	.	.	.
	.	.	.	.	.	.
STA	5.67	.	.	.	.	.
	39.14	.	.	.	.	.
DTT	5.97	5.95	.	.	.	.
	43.85	47.43	.	.	.	.
BIT	4.13	5.01	4.30	.	.	.
	46.23	32.28	40.18	.	.	.
CUA	6.56	6.56	5.62	3.82	.	.
	50.98	68.48	51.24	36.97	.	.
None	2.39	.62	4.46	4.55	3.61	2.09
	7.36	1.82	27.34	33.70	11.91	3.52

Table 12: Static Multivariate Treatment Model (5 PEIA Modes)

	GTA	STA	DTT	BIT	CUA
$SumGDP_{ijt}$	-.464***	.223***	.223**	-.354*	.408*
	(.111)	(.083)	(.108)	(.211)	(.242)
$SimGDP_{ijt}$	.092	.148**	-.132*	-.729***	.679***
	(.087)	(.062)	(.080)	(.176)	(.179)
$SumPOP_{ijt}$	-.231	-.658***	-2.51***	-1.89***	-5.66***
	(.225)	(.192)	(.223)	(.397)	(.497)
$SimPOP_{ijt}$	-.183	-.131	-.287*	.460	-.782
	(.199)	(.120)	(.167)	(.374)	(.518)
$SimGDPPC_{ijt}$	-.037	-.188***	.408***	.501**	.582**
	(.088)	(.061)	(.090)	(.211)	(.232)
$SimGDPPC^2_{ijt}$	-.003	-.003	-.201***	-.189**	.159**
	(.038)	(.022)	(.027)	(.084)	(.068)
$Remote_{ij}$	9.58***	-3.68***	6.35***	5.26**	13.65***
	(1.41)	(1.08)	(1.40)	(2.57)	(3.07)
$Drowkl_{ij}$	-.002	.049	-.062	.331*	-1.20***
	(.121)	(.100)	(.118)	(.196)	(.257)
log $Distance_{ij}$	-.384***	.113***	-.495***	-.462***	-.229***
	(.035)	(.037)	(.031)	(.043)	(.043)
Common $Border_{ij}$	.513***	.306***	-.349***	-.404***	-.043
	(.101)	(.117)	(.117)	(.158)	(.148)
Common $Language_{ij}$	.490***	.003	.136**	-.201*	.546***
	(.055)	(.062)	(.061)	(.108)	(.064)
Same $Continent_{ij}$	.340***	.490***	.102*	-.056	.287***
	(.057)	(.062)	(.053)	(.077)	(.064)
WTO $Member_{ijt}$ (one)	.082	-.151***	.798***	.293*	-.062
	(.055)	(.034)	(.090)	(.170)	(.171)
WTO $Member_{ijt}$ (both)	.079	-.241***	.887***	.267	-.161
	(.061)	(.040)	(.096)	(.175)	(.179)
$Landlocked_{ij}$ (one)	.021	-.820***	.093**	.319***	-.172***
	(.049)	(.061)	(.044)	(.062)	(.060)
$Landlocked_{ij}$ (both)	.014	-1.58***	.268**	.639***	-.302*
	(.114)	(.158)	(.127)	(.154)	(.182)
$CDWar_{ijt}$	-.0001	-.0001	-.0001	-1.16e-06	.00004
	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)
$DiffYearWar_{ijt}$	.001	-.004	.006	.002	-.003
	(.004)	(.004)	(.004)	(.005)	(.005)
$DiffRegDur_{ijt}$	-.006***	-.008***	.004***	.007***	-.003***
	(.001)	(.001)	(.001)	(.001)	(.001)
$DiffPolFreed_{ijt}$	-.015***	-.009***	-.006**	.004	.006
	(.003)	(.003)	(.003)	(.004)	(.004)

Notes: Multivariate probit model. Pair-specific means and year dummies included. ***, **, and * indicate that coefficients are significantly different from zero at 1, 5, and 10 percent, respectively.

Table 13: Correlations of Error Terms Across Equations in Static Multivariate Treatment Model with 5 PEIA Modes

Mode/ Mode	GTA	STA	DTT	BIT	CUA
GTA	.	.	.	.	.
	.	.	.	.	.
STA	.455***	.	.	.	.
	(.020)	.	.	.	.
DTT	.082***	.020	.	.	.
	(.021)	(.020)	.	.	.
BIT	-.088***	-.129***	.468***	.	.
	(.022)	(.022)	(.023)	.	.
CUA	.035	.082***	.020	-.001	.
	(.029)	(.027)	(.023)	(.031)	.

Notes: The LR-statistic testing whether the disturbances are jointly independent amounts to 6,341.56 and is distributed as $\chi^2(10)$. *** indicates that correlation coefficients are significantly different from zero at 1 percent.

Table 14: Static Multivariate Treatment Model (6 PEIA Modes)

	DGTA	SGTA	STA	DTT	BIT	CUA
SumGDP_{ijt}	-.848***	.079	.241***	.220**	-.358*	.388*
	(.162)	(.081)	(.083)	(.108)	(.212)	(.243)
SimGDP_{ijt}	.326**	-.189***	.158**	-.140*	-.769***	.680***
	(.132)	(.065)	(.062)	(.080)	(.178)	(.180)
SumPOP_{ijt}	1.45***	-.564***	-.689***	-2.49***	-1.87***	-5.68***
	(.310)	(.170)	(.192)	(.223)	(.397)	(.497)
SimPOP_{ijt}	-1.30***	.381***	-.105	-.280*	.498	-.783
	(.343)	(.105)	(.120)	(.168)	(.376)	(.518)
SimGDPPC_{ijt}	.009	.012	-.178***	.405***	.512**	.593**
	(.132)	(.083)	(.062)	(.090)	(.212)	(.233)
SimGDPPC^2_{ijt}	-.034	.053	-.007	-.201***	-.198**	.160**
	(.055)	(.040)	(.023)	(.027)	(.085)	(.069)
Remote_{ij}	10.92***	3.87***	-3.62***	6.30***	5.74**	13.81***
	(2.02)	(.903)	(1.08)	(1.40)	(2.64)	(3.09)
Drowkl_{ij}	.206	-.083	.060	-.067	.329*	-1.21***
	(.171)	(.106)	(.101)	(.118)	(.198)	(.258)
log Distance_{ij}	-.470***	-.166***	.114***	-.495***	-.461***	-.230***
	(.037)	(.052)	(.037)	(.031)	(.043)	(.043)
Common Border_{ij}	.277***	.516***	.318***	-.348***	-.398**	-.039
	(.106)	(.136)	(.119)	(.117)	(.157)	(.147)
Common Language_{ij}	.602***	.406***	.007	.138**	-.195*	.548***
	(.060)	(.074)	(.062)	(.061)	(.108)	(.064)
Same Continent_{ij}	.377***	.242***	.488***	.102*	-.059	.284***
	(.060)	(.086)	(.062)	(.053)	(.077)	(.063)
WTO Member_{ijt} (one)	.027	.045	-.149***	.795***	.286*	-.058
	(.070)	(.050)	(.034)	(.090)	(.171)	(.171)
WTO Member_{ijt} (both)	.001	.022	-.236***	.885***	.252	-.156
	(.086)	(.051)	(.041)	(.096)	(.176)	(.178)
Landlocked_{ij} (one)	.056	.058	-.823***	.095**	.316***	-.172***
	(.054)	(.071)	(.061)	(.044)	(.061)	(.060)
Landlocked_{ij} (both)	.198*	.177	-1.58***	.268**	.648***	-.293*
	(.117)	(.156)	(.157)	(.127)	(.154)	(.181)
CDWar_{ijt}	-.001***	.0001	-.0001	-.0001	-3.67e-06	.0001
	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)
DiffYearWar_{ijt}	.003	.005	-.003	.006	.002	-.003
	(.004)	(.005)	(.004)	(.004)	(.005)	(.005)
DiffRegDur_{ijt}	-.003***	-.010***	-.008***	.004***	.007***	-.003***
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
$\text{DiffPolFreed}_{ijt}$	-.021***	-.005	-.009***	-.006**	.003	.006
	(.003)	(.004)	(.003)	(.003)	(.004)	(.004)

Table 15: Correlations of Error Terms Across Equations in Static Multivariate Treatment Model with 6 PEIA Modes

Mode/ Mode	DGTA	SGTA	STA	DTT	BIT	CUA
DGTA	.	.	.	.	.	.
	.	.	.	.	.	.
SGTA	.091***	.	.	.	.	.
	(.031)	.	.	.	.	.
STA	.430***	.167***	.	.	.	.
	(.027)	(.027)	.	.	.	.
DTT	.078***	.027	.023	.	.	.
	(.019)	(.022)	(.020)	.	.	.
BIT	-.038*	-.082***	-.109***	.473***	.	.
	(.022)	(.024)	(.022)	(.023)	.	.
CUA	.100***	.005	.082***	.022	-.007	.
	(.029)	(.030)	(.026)	(.030)	(.031)	.

Notes: The LR-statistic testing whether the disturbances are jointly independent amounts to 728.16 and is distributed as $\chi^2(10)$. *** indicates that correlation coefficients are significantly different from zero at 1 percent.

Table 16: Dynamic Multivariate Treatment Model (5 PEIA Modes)

	GTA	STA	DTT	BIT	CUA
SumGDP_{ijt}	.579***	.033	-.250	.410	-.345
	(.199)	(.184)	(.189)	(.310)	(.275)
SimGDP_{ijt}	.335**	-.676***	-.424***	.295	.174
	(.155)	(.168)	(.146)	(.301)	(.229)
SumPOP_{ijt}	-1.03**	-5.06***	-.533	3.67***	-3.68***
	(.428)	(.422)	(.370)	(.740)	(.595)
SimPOP_{ijt}	-2.70***	-.152	-.372	1.67*	-.142
	(.338)	(.380)	(.304)	(.957)	(.484)
SimGDPPC_{ijt}	-.391**	-.271	.137	.292	1.06***
	(.182)	(.185)	(.145)	(.309)	(.283)
SimGDPPC^2_{ijt}	.029	-.201**	-.068	-.100	.142*
	(.062)	(.083)	(.045)	(.131)	(.082)
Remote_{ij}	-6.80***	-4.18*	-1.08	5.43	-1.39
	(1.75)	(2.52)	(1.80)	(4.57)	(2.06)
Drowkl_{ij}	.782***	1.74***	-.167	1.04***	-1.95***
	(.243)	(.239)	(.224)	(.370)	(.326)
log Distance_{ij}	-.345***	-.028	-.286***	-.275***	-.200***
	(.026)	(.029)	(.022)	(.033)	(.037)
Common Border_{ij}	-.026	.079	-.255***	-.112	-.296***
	(.093)	(.085)	(.082)	(.110)	(.114)
Common Language_{ij}	.452***	.057	.015	-.221***	-.192**
	(.047)	(.054)	(.044)	(.082)	(.092)
Same Continent_{ij}	.182***	.377***	.130***	-.012	.028
	(.043)	(.047)	(.038)	(.058)	(.063)
WTO Member_{ijt} (one)	-.175**	-.053	.339***	.149	-.194
	(.088)	(.152)	(.104)	(.199)	(.182)
WTO Member_{ijt} (both)	.411***	.567***	.412***	.193	-.534***
	(.110)	(.159)	(.123)	(.213)	(.190)
Landlocked_{ij} (one)	.083**	-.326***	.077***	.182***	-.137***
	(.038)	(.044)	(.029)	(.047)	(.053)
Landlocked_{ij} (both)	.232**	-.510***	.196**	.390***	-.278***
	(.107)	(.121)	(.083)	(.122)	(.085)
CDWar_{ijt}	-.0001	-.0002	-.0001**	6.07e-06	.0001
	(.00004)	(.0001)	(.00004)	(.00003)	(.00004)
DiffYearWar_{ijt}	.002	.001	.0001	-.001	-.007
	(.003)	(.003)	(.003)	(.003)	(.009)
DiffRegDur_{ijt}	.001	-.002***	.001***	.003***	-.003***
	(.001)	(.001)	(.001)	(.001)	(.001)
$\text{DiffPolFreed}_{ijt}$	-.017***	-.010***	.001	.0001	-.0003
	(.003)	(.003)	(.002)	(.003)	(.004)

Notes: Multivariate probit model. Pair-specific means and year dummies included. Lagged values of all dependent variables and initial conditions included.

Table 17: Correlations of Error Terms Across Equations in Dynamic Multivariate Treatment Model with 5 PEIA Modes

Mode/ Mode	GTA	STA	DTT	BIT	CUA
GTA	.	.	.	.	.
	.	.	.	.	.
STA	.590***	.	.	.	.
	(.019)	.	.	.	.
DTT	.033	.031	.	.	.
	(.027)	(.022)	.	.	.
BIT	-.028	-.026	.129***	.	.
	(.032)	(.033)	(.042)	.	.
CUA	.038	-.001	.029	-.115***	.
	(.055)	(.052)	(.042)	(.038)	.

Notes: The LR-statistic testing whether the disturbances are jointly independent amounts to $5,756.60$ and is distributed as $\chi^2(15)$. *** indicates that correlation coefficients are significantly different from zero at 1 percent.

Table 18: Dynamic Multivariate Treatment Model (6 PEIA Modes)

	DGTA	SGTA	STA	DTT	BIT	CUA
SumGDP_{ijt}	.259	-.370	.062	-.239	.404	-.355
	(.204)	(.693)	(.186)	(.189)	(.312)	(.273)
SimGDP_{ijt}	.426***	-.414	-.706***	-.432***	.305	.197
	(.150)	(.397)	(.171)	(.146)	(.302)	(.227)
SumPOP_{ijt}	-.683	-1.70	-5.06***	-.568	3.69***	-3.80***
	(.450)	(1.28)	(.417)	(.368)	(.744)	(.594)
SimPOP_{ijt}	-3.06***	.486	-.107	-.362	1.68*	-.149
	(.372)	(.923)	(.387)	(.304)	(.963)	(.486)
SimGDPPC_{ijt}	-.359*	-.659*	-.267	.140	.277	1.07***
	(.187)	(.338)	(.188)	(.146)	(.309)	(.283)
SimGDPPC^2_{ijt}	-.005	.407***	-.203**	-.069	-.095	.157*
	(.073)	(.112)	(.085)	(.046)	(.132)	(.083)
Remote_{ij}	-3.40	-8.71**	-3.81	-1.12	5.35	-1.18
	(2.15)	(3.90)	(2.43)	(1.80)	(4.51)	(2.21)
Drowkl_{ij}	1.36***	-2.52***	1.70***	-.160	1.04***	-1.99***
	(.239)	(.761)	(.244)	(.224)	(.371)	(.326)
log Distance_{ij}	-.338***	-.492***	-.029	-.286***	-.276***	-.197***
	(.026)	(.068)	(.029)	(.022)	(.032)	(.037)
Common Border_{ij}	.019	-.342*	.055	-.250***	-.091	-.262**
	(.079)	(.179)	(.086)	(.083)	(.109)	(.113)
Common Language_{ij}	.452***	.161	.055	.016	-.212***	-.181**
	(.044)	(.149)	(.053)	(.045)	(.081)	(.092)
Same Continent_{ij}	.161***	.267**	.385***	.132***	-.009	.026
	(.044)	(.104)	(.046)	(.038)	(.058)	(.064)
WTO Member_{ijt} (one)	-.251***	.025	-.036	.339***	.159	-.188
	(.088)	(.239)	(.161)	(.104)	(.199)	(.183)
WTO Member_{ijt} (both)	.251**	.531	.596***	.411***	.206	-.530***
	(.112)	(.449)	(.163)	(.123)	(.213)	(.191)
Landlocked_{ij} (one)	.004	.623***	-.334***	.079***	.184***	-.138***
	(.038)	(.102)	(.043)	(.029)	(.047)	(.052)
Landlocked_{ij} (both)	.149*	1.34***	-.500***	.194**	.396***	-.273***
	(.092)	(.162)	(.122)	(.084)	(.123)	(.086)
CDWar_{ijt}	-.0004***	.0001*	-.0003	-.0001*	1.56e-06	.0001
	(.0001)	(.00004)	(.0002)	(.00004)	(.00003)	(.00004)
DiffYearWar_{ijt}	.006*	-.011**	.001	.0003	-.001	-.008
	(.003)	(.005)	(.003)	(.003)	(.003)	(.010)
DiffRegDur_{ijt}	.001	.001	-.002***	.001***	.003***	-.003***
	(.001)	(.002)	(.001)	(.001)	(.001)	(.001)
$\text{DiffPolFreed}_{ijt}$	-.017***	-.012	-.010***	.001	-.0003	.0002
	(.003)	(.008)	(.003)	(.002)	(.003)	(.004)

Table 19: CORRELATIONS OF ERROR TERMS ACROSS EQUATIONS IN DYNAMIC MULTIVARIATE TREATMENT MODEL WITH 6 PEIA MODES

Mode/ Mode	DGTA	SGTA	STA	DTT	BIT	CUA
DGTA	.	.	.	.	.	.
	.	.	.	.	.	.
SGTA	-.069	.	.	.	.	.
	(.080)	.	.	.	.	.
STA	.585***	-.035	.	.	.	.
	(.019)	(.054)	.	.	.	.
DTT	.028	.017	.032	.	.	.
	(.027)	(.026)	(.026)	.	.	.
BIT	-.017	-.015	.003	.124***	.	.
	(.031)	(.041)	(.041)	(.038)	.	.
CUA	.080	-.042	.089*	-.014	-.030	.
	(.051)	(.047)	(.050)	(.041)	(.039)	.

Notes: The LR-statistic testing whether the disturbances are jointly independent amounts to 717.33 and is distributed as $\chi^2(15)$. *** and * indicate that correlation coefficients are significantly different from zero at 1 and 10 percent, respectively.

Table 20: MATTHEWS' CORRELATION COEFFICIENTS AND OPTIMAL PROBABILITY CUT-OFFS FOR STATIC AND DYNAMIC 5-PEIA MODELS

	Estimated Model	
PEIA	Static	Dynamic
GTA	68.53	96.22
	(0.56)	(0.56)
STA	67.51	97.43
	(0.69)	(0.73)
DTT	66.57	96.34
	(0.70)	(0.65)
BIT	69.28	96.00
	(0.76)	(0.26)
CUA	66.07	89.03
	(0.65)	(0.68)

Notes: Figures in the Table are maximum attainable Matthews' correlation coefficients in the estimated models. The values reported materialize at the probability cutoff values reported in parentheses.

Table 21: Long-run Effects of PEIAs on the Probability of Positive Bilateral Services Exports (Extensive Country-pair Margin)

	Controls									
Treatment	00000	00001	00010	00011	00100	00101	00110	00111	01000	01010
00000	.	-0.16	-0.07	-0.02	-0.21	-0.06	-0.07	-0.05	-0.06	-0.07
	.	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01
00001	0.20	.	-0.02	-0.03	-0.02	-0.02	-0.03	-0.02	0.05	.
	0.02	.	0.02	0.02	0.02	0.02	0.02	0.02	0.02	.
00100	0.02	0.01	0.00	0.00	.	0.00	0.00	0.00	0.01	0.00
	0.01	0.02	0.00	0.00	.	0.00	0.00	0.00	0.03	0.00
00110	0.02	0.00	0.00	0.00	0.00	0.00	.	0.00	0.01	0.00
	0.02	0.03	0.00	0.00	0.00	0.00	.	0.00	0.04	0.00
01000	0.10	-0.01	-0.07	-0.07	-0.06	-0.10	-0.06	-0.09	.	-0.05
	0.02	0.04	0.01	0.02	0.01	0.03	0.01	0.02	.	0.02
10000	0.11	-0.09	-0.09	-0.12	-0.08	-0.14	-0.09	-0.13	-0.06	-0.17
	0.02	0.04	0.03	0.03	0.02	0.04	0.02	0.03	0.03	0.05
10100	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	.
	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	.
11000	0.15	0.01	-0.02	-0.03	-0.02	.	-0.02	-0.03	0.04	-0.02
	0.02	0.03	0.02	0.02	0.01	.	0.01	0.02	0.02	0.02
11100	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
11101	.	.	.	.	0.00	.	.	.	.	.
	.	.	.	.	0.00	.	.	.	.	.
11110	0.09	.	0.00	.	0.00	0.00	0.00	0.00	0.03	0.00
	0.01	.	0.00	.	0.00	0.00	0.00	0.00	0.02	0.00

Table 22: Long-run Effects of PEIAs on the Probability of Positive Bilateral Services Exports (Extensive Country-pair Margin) Cont'd

	Controls										
Treatment	01100	01110	10000	10010	10100	10110	11000	11001	11010	11100	11101
00000	-0.11	-0.06	0.10	-0.06	-0.12	-0.02	-0.02	-0.05	-0.05	-0.05	-0.01
	0.01	0.01	0.03	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.00
00001	-0.03	.	0.06	.	-0.02	.	.	-0.02	.	-0.02	-0.03
	0.02	.	0.02	.	0.02	.	.	0.02	.	0.02	0.02
00100	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	0.00	0.00	0.00
	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00
00110	0.00	0.00	0.01	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00
	0.00	0.00	0.04	0.00	0.00	0.00	0.02	.	0.00	0.00	0.00
01000	-0.06	-0.06	0.01	-0.08	-0.09	-0.08	-0.06	.	-0.07	-0.07	-0.08
	0.01	0.02	0.03	0.03	0.02	0.02	0.02	.	0.02	0.01	0.03
10000	-0.10	-0.15	.	-0.13	-0.08	-0.10	-0.08	-0.10	-0.09	-0.09	-0.10
	0.02	0.04	.	0.03	0.02	0.03	0.02	0.04	0.03	0.02	0.03
10100	0.00	0.00	0.02	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.02	0.00	.	0.00	0.02	0.00	0.00	0.00	0.00
11000	-0.02	-0.02	0.06	-0.03	-0.02	-0.04	.	-0.03	-0.02	-0.02	-0.03
	0.01	0.02	0.02	0.02	0.01	0.02	.	0.02	0.01	0.01	0.02
11100	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	.	0.00
	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	.	0.00
11101	.	.	.	.	0.00	.	.	.	.	0.00	.
	.	.	.	.	0.00	.	.	.	.	0.00	.
11110	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00

Table 23: LONG-RUN EFFECTS OF PEIAS ON THE LOG BILATERAL GOODS EXPORTS (INTENSIVE COUNTRY-PAIR MARGIN)

	Controls									
Treatment	00000	00001	00010	00011	00100	00101	00110	00111	01000	01010
00000	.	-2.25	-4.24	-4.06	-2.88	-4.75	-4.21	-4.59	0.12	-3.91
	.	0.54	0.32	0.70	0.20	0.88	0.27	0.44	0.27	0.78
00001	2.60	.	-1.85	-2.97	-1.73	-3.66	-3.03	-3.61	2.19	.
	0.46	.	0.60	0.82	0.48	0.74	0.50	0.56	0.51	.
00100	2.37	1.28	-0.97	-1.25	.	-1.25	-1.64	-1.71	0.40	-1.92
	0.15	0.64	0.28	0.68	.	0.66	0.18	0.37	0.52	0.71
00110	3.49	2.17	0.93	-0.16	1.00	-0.48	.	-0.24	2.91	1.05
	0.20	0.81	0.32	0.67	0.19	0.70	.	0.34	0.55	0.72
01000	0.71	-3.23	-4.48	-5.42	-4.28	-6.99	-5.80	-6.28	.	-4.18
	0.20	1.20	0.42	0.78	0.34	1.11	0.31	0.61	.	0.71
10000	2.32	-0.10	-3.34	-3.89	-2.22	-3.71	-4.38	-3.98	0.95	.
	0.27	0.89	0.44	0.80	0.38	0.82	0.36	0.62	0.43	.
10100	2.23	1.43	-1.58	-2.81	-0.97	-1.63	-2.77	-2.64	1.64	.
	0.32	0.76	0.43	0.79	0.31	0.70	0.32	0.42	0.49	.
11000	3.04	-0.31	-2.61	-3.84	-2.09	.	-3.62	-3.84	2.04	-2.31
	0.33	0.90	0.47	0.78	0.39	.	0.40	0.58	0.38	0.80
11100	4.44	3.03	0.68	-0.90	0.78	-0.29	-0.36	-0.54	4.88	0.83
	0.25	0.65	0.39	0.83	0.25	0.68	0.25	0.43	0.33	0.66
11101	.	.	.	.	1.15	.	.	.	.	.
	.	.	.	.	0.31	.	.	.	.	.
11110	4.84	.	1.20	.	1.26	-0.33	0.45	0.17	4.58	1.48
	0.22	.	0.34	.	0.24	0.67	0.23	0.36	0.33	0.70

Table 24: Long-run Effects of PEIAs on the Log Bilateral Goods Exports (Intensive Country-pair Margin) Cont'd

	Controls											
Treatment	01100	01110	10000	10010	10100	10110	11000	11001	11010	11100	11101	11110
00000	-2.32	-4.56	0.17	-2.83	-2.10	-1.98	0.00	-1.42	-3.25	-3.83	-1.90	-3.07
	0.75	0.85	0.45	0.72	0.40	0.54	0.50	1.83	0.97	0.39	0.50	0.43
00001	-0.70	.	1.26	.	-1.35	.	.	-1.67	.	-3.53	-4.17	-3.52
	0.78	.	0.52	.	0.54	.	.	1.42	.	0.51	0.56	0.64
00100	-0.99	-3.52	1.26	-0.93	-0.11	-0.77	-0.32	-0.36	-2.42	-1.91	-2.96	-2.51
	0.68	0.63	0.48	0.65	0.31	0.42	0.59	1.50	0.64	0.23	0.40	0.22
00110	1.44	-1.00	3.36	2.01	1.15	0.72	2.06	.	-0.71	-0.73	-1.28	-0.57
	0.79	0.58	0.53	0.64	0.42	0.58	0.60	.	0.63	0.33	0.31	0.23
01000	-3.11	-6.09	-0.26	-4.27	-5.06	-5.46	-1.91	.	-6.40	-4.96	-5.56	-6.48
	0.60	0.59	0.47	1.01	0.71	0.89	0.45	.	0.83	0.40	0.82	0.46
10000	-2.49	-4.98	.	-3.70	-2.60	-3.53	-2.11	-3.21	-5.11	-4.67	-6.05	-5.32
	0.72	0.67	.	0.69	0.37	0.66	0.49	1.73	0.70	0.35	0.41	0.35
10100	-1.13	-3.31	1.45	-0.61	.	-2.15	-0.03	-2.38	-2.52	-2.35	-2.19	-3.08
	0.70	0.64	0.37	0.67	.	0.51	0.48	1.46	0.66	0.33	0.51	0.31
11000	-1.13	-4.08	1.24	-2.15	-1.36	-3.94	.	-2.90	-4.23	-3.54	-4.87	-4.22
	0.67	0.87	0.40	0.72	0.46	0.71	.	1.75	0.75	0.39	0.52	0.43
11100	2.37	-0.17	3.62	1.40	1.60	-0.24	2.96	-0.47	-0.39		-0.85	-0.76
	0.56	0.71	0.36	0.67	0.40	0.58	0.40	1.62	0.63		0.32	0.27
11101	.	.	.	.	1.57	.	.	.	.	0.33	.	.
	.	.	.	.	0.46	.	.	.	.	0.34	.	.
11110	2.80	0.99	3.98	1.97	1.97	1.29	3.40	2.01	0.84	0.48	-0.28	.
	0.57	0.75	0.41	0.67	0.38	0.40	0.40	1.38	0.64	0.26	0.30	.

Table 25: Long-run Effects of PEIAs on the Probability of Positive Bilateral Services Exports (Extensive Country-pair Margin)

	Controls									
Treatment	00000	00001	00010	00011	00100	00101	00110	00111	01000	01010
00000	.	-0.06	-0.16	-0.19	-0.19	-0.39	-0.40	-0.52	0.05	0.07
	.	0.05	0.09	0.22	0.03	0.14	0.07	0.16	0.00	0.01
00001	0.07	.	-0.06	-0.19	-0.14	-0.08	-0.28	-0.36	0.13	.
	0.03	.	0.08	0.22	0.04	0.10	0.05	0.11	0.04	.
00100	0.12	0.11	-0.01	0.03	.	0.04	-0.18	-0.16	0.18	0.19
	0.02	0.05	0.07	0.22	.	0.10	0.04	0.13	0.02	0.03
00110	0.31	0.31	0.14	0.13	0.12	0.26	.	-0.13	0.46	0.46
	0.03	0.07	0.09	0.22	0.04	0.12	.	0.12	0.04	0.05
01000	-0.01	-0.07	-0.15	-0.13	-0.11	-0.29	-0.35	-0.58	.	0.00
	0.01	0.08	0.10	0.24	0.04	0.17	0.06	0.19	.	0.00
10000	-0.01	-0.04	-0.21	-0.23	-0.13	-0.16	-0.46	-0.25	0.00	0.00
	0.01	0.06	0.08	0.23	0.04	0.11	0.06	0.18	0.00	0.00
10100	-0.04	-0.02	-0.16	-0.33	-0.26	-0.11	-0.41	-0.42	0.05	.
	0.02	0.06	0.09	0.24	0.03	0.10	0.05	0.12	0.03	.
11000	0.00	-0.02	-0.14	-0.21	-0.14	.	-0.40	-0.32	0.02	0.03
	0.01	0.06	0.09	0.22	0.03	.	0.06	0.16	0.01	0.02
11100	0.29	0.30	0.19	-0.23	0.08	0.27	-0.11	-0.03	0.36	0.38
	0.04	0.08	0.10	0.27	0.05	0.11	0.06	0.15	0.04	0.05
11101	.	.	.	.	0.50	.	.	.	.	.
	.	.	.	.	0.06	.	.	.	.	.
11110	0.67	.	0.51	.	0.44	0.64	0.25	0.28	0.71	0.75
	0.05	.	0.10	.	0.05	0.11	0.07	0.13	0.05	0.05

Table 26: Long-run Effects of PEIAs on the Probability of Positive Bilateral Services Exports (Extensive Country-pair Margin) Cont'd

	Controls										
Treatment	01100	01110	10000	10010	10100	10110	11000	11001	11010	11100	11101
00000	0.05	0.08	0.05	0.07	0.04	-0.17	0.05	0.09	0.05	-0.02	-0.48
	0.01	0.01	0.01	0.01	0.03	0.10	0.02	0.02	0.21	0.09	0.10
00001	0.18	.	0.12	.	0.11	.	.	0.18	.	-0.19	-0.71
	0.05	.	0.04	.	0.04	.	.	0.05	.	0.06	0.06
00100	0.17	0.18	0.24	0.23	0.22	0.06	0.12	0.24	-0.07	-0.06	-0.59
	0.02	0.02	0.02	0.03	0.02	0.08	0.03	0.04	0.13	0.05	0.07
00110	0.44	0.46	0.38	0.45	0.37	0.14	0.43	.	0.12	-0.02	-0.34
	0.04	0.04	0.04	0.04	0.04	0.11	0.04	.	0.14	0.07	0.06
01000	0.00	0.00	0.00	0.00	-0.07	-0.62	0.00	.	-0.01	-0.02	-0.67
	0.00	0.00	0.01	0.00	0.05	0.16	0.02	.	0.16	0.07	0.13
10000	0.01	0.00	.	0.01	-0.02	-0.16	-0.02	0.02	-0.31	-0.22	-0.87
	0.01	0.00	.	0.01	0.02	0.10	0.02	0.02	0.13	0.05	0.05
10100	0.05	0.06	0.03	0.03	.	-0.09	-0.03	0.07	-0.18	-0.23	-0.46
	0.03	0.03	0.02	0.02	.	0.08	0.02	0.03	0.12	0.05	0.08
11000	0.02	0.02	0.01	0.03	0.00	-0.24	.	0.03	-0.17	-0.22	-0.82
	0.02	0.02	0.01	0.02	0.02	0.10	.	0.02	0.14	0.05	0.07
11100	0.35	0.35	0.35	0.35	0.32	0.06	0.31	0.38	0.08	.	-0.45
	0.04	0.04	0.04	0.05	0.05	0.11	0.04	0.05	0.14	.	0.06
11101	.	.	.	.	0.81	.	.	.	.	0.42	.
	.	.	.	.	0.06	.	.	.	.	0.07	.
11110	0.69	0.68	0.70	0.75	0.67	0.54	0.68	0.77	0.42	0.36	-0.11
	0.05	0.05	0.05	0.05	0.05	0.09	0.05	0.06	0.14	0.07	0.07

Table 27: Long-run Effects of PEIAs on Log Bilateral Services Exports (Intensive Country-pair Margin)

	Controls								
Treatment	00000	00001	00010	00100	00110	00111	10110	11100	11101
00000	.	-0.47	.	-1.19	-0.55	.	.	.	.
	.	0.57	.	0.28	0.41	.	.	.	.
00100	1.58	1.02	0.48	.	-0.30	1.46	.	-1.76	-2.05
	0.21	0.60	0.59	.	0.28	0.69	.	0.45	0.32
00110	1.54	1.54	1.15	-0.03	.	0.77	.	-1.61	-2.20
	0.28	0.67	0.65	0.28	.	0.71	.	0.48	0.33
11101	.	.	.	0.23	.	.	.	-0.09	.
	.	.	.	0.36	.	.	.	0.51	.
11110	.	.	.	-0.05	0.41	.	0.94	-0.77	-1.23
	.	.	.	0.29	0.33	.	1.32	0.44	0.32

Table 28: Long-run Effects of PEIAs on the Probability of Positive Bilateral Stocks of Outward FDI (Extensive Country-pair Margin)

	Controls									
Treatment	00000	00001	00010	00011	00100	00101	00110	00111	01000	01010
00000	.	-0.11	-0.29	-0.31	-0.02	-0.28	-0.12	-0.17	0.01	0.03
	.	0.05	0.09	0.24	0.03	0.15	0.06	0.13	0.01	0.01
00001	0.13	.	-0.05	-0.32	0.04	-0.09	-0.01	-0.07	0.14	.
	0.04	.	0.09	0.23	0.04	0.11	0.05	0.10	0.04	.
00100	0.08	-0.12	-0.19	-0.23	.	-0.08	-0.05	-0.04	0.06	0.04
	0.01	0.05	0.08	0.23	.	0.11	0.03	0.11	0.02	0.02
00110	0.13	0.06	-0.14	-0.25	-0.01	-0.12	.	-0.01	0.17	0.22
	0.03	0.07	0.09	0.23	0.03	0.12	.	0.10	0.04	0.04
01000	0.00	-0.20	-0.28	-0.26	-0.05	-0.30	-0.17	-0.26	.	0.02
	0.01	0.10	0.11	0.25	0.03	0.18	0.05	0.15	.	0.01
10000	0.06	0.02	-0.15	-0.24	-0.07	0.00	-0.11	-0.01	0.07	0.12
	0.02	0.07	0.10	0.25	0.03	0.12	0.05	0.15	0.02	0.04
10100	0.01	-0.06	-0.28	-0.45	-0.12	-0.07	-0.09	-0.13	0.03	.
	0.02	0.06	0.09	0.25	0.03	0.11	0.04	0.10	0.03	.
11000	0.12	-0.02	-0.11	-0.30	0.01	.	-0.07	-0.01	0.12	0.12
	0.03	0.07	0.10	0.23	0.04	.	0.05	0.13	0.03	0.04
11100	0.37	0.30	0.16	-0.22	0.21	0.19	0.21	0.31	0.41	0.46
	0.05	0.08	0.11	0.29	0.05	0.12	0.06	0.13	0.05	0.06
11101	.	.	.	.	0.21	.	.	.	.	.
	.	.	.	.	0.07	.	.	.	.	.
11110	0.23	.	0.06	.	0.05	-0.04	0.09	0.03	0.28	0.31
	0.05	.	0.10	.	0.05	0.12	0.06	0.11	0.06	0.06

Table 29: Long-run Effects of PEIAs on the Probability of Positive Bilateral Stocks of Outward FDI (Extensive Country-pair Margin) Cont'd

	Controls										
Treatment	01100	01110	10000	10010	10100	10110	11000	11001	11010	11100	11101
00000	-0.33	0.02	-0.02	-0.29	0.02	-0.01	-0.02	-0.48	-0.27	-0.27	-0.69
	0.11	0.19	0.03	0.20	0.04	0.07	0.06	0.35	0.22	0.10	0.13
00001	0.05	.	0.10	.	0.11	.	.	-0.04	.	-0.22	-0.31
	0.09	.	0.04	.	0.05	.	.	0.26	.	0.06	0.08
00100	-0.15	-0.25	-0.01	-0.15	0.05	0.04	-0.26	-0.23	-0.18	-0.27	-0.33
	0.09	0.13	0.03	0.18	0.03	0.06	0.06	0.29	0.14	0.05	0.10
00110	0.01	0.04	0.08	-0.09	0.08	0.02	-0.02	.	-0.28	-0.25	-0.33
	0.11	0.13	0.05	0.18	0.04	0.08	0.07	.	0.14	0.07	0.08
01000	-0.12	-0.08	-0.03	-0.03	0.01	-0.27	-0.07	.	-0.30	-0.23	-0.63
	0.08	0.12	0.03	0.26	0.04	0.10	0.04	.	0.18	0.08	0.17
10000	-0.03	-0.01	.	-0.08	0.01	0.04	-0.06	0.00	-0.41	-0.32	-0.40
	0.09	0.12	.	0.18	0.03	0.08	0.05	0.31	0.14	0.06	0.07
10100	-0.06	-0.17	-0.06	-0.14	.	-0.11	-0.15	-0.11	-0.39	-0.37	-0.50
	0.09	0.13	0.03	0.18	.	0.06	0.05	0.27	0.14	0.05	0.12
11000	-0.14	0.01	0.07	-0.05	0.08	-0.03	.	0.06	-0.16	-0.23	-0.33
	0.08	0.18	0.04	0.18	0.04	0.08	.	0.32	0.15	0.06	0.10
11100	0.25	0.31	0.31	0.24	0.34	0.29	0.26	0.32	0.06	.	-0.06
	0.08	0.16	0.05	0.19	0.05	0.09	0.06	0.31	0.15	.	0.08
11101	.	.	.	.	0.39	.	.	.	.	0.08	.
	.	.	.	.	0.08	.	.	.	.	0.09	.
11110	0.12	0.16	0.22	-0.10	0.23	0.21	0.11	0.09	-0.20	-0.12	-0.23
	0.09	0.17	0.06	0.19	0.06	0.08	0.06	0.27	0.15	0.07	0.08

Table 30: Long-run Effects of PEIAs on Log Bilateral Services Exports (Intensive Country-pair Margin)

	Controls						
Treatment	00000	00001	00100	00110	11000	11100	11101
00000	.	.	-0.98	-2.37	.	-1.23	.
	.	.	0.69	0.74	.	0.83	.
00100	2.33	0.60		-0.47	.	1.09	-0.49
	0.60	0.80		0.60	.	0.75	1.05
11100	.	.	-0.71	-1.16	0.13	.	-0.30
	.	.	0.59	0.60	0.71	.	0.94

Table 31: Average Treatment Effect (ATE) of More versus Less PEIAs on the Propensity of Positive Bilateral Economic Activity (Based on 5-PEIA Model Long-Run Results

♯ PEIAs of Treated	♯ PEIAs of Controls 0	1	2	3
ATE on goods exports propensity				
1	0.09	.	.	.
2	0.07	0.04	.	.
3	0.05	0.05	0.01	.
4	0.06	0.03	0.00	0.00
ATE on services exports propensity				
1	0.05	.	.	.
2	0.09	0.04	.	.
3	0.11	0.15	0.10	.
4	0.61	0.63	0.76	0.51
ATE on outward FDI propensity				
1	0.08	.	.	.
2	0.14	0.05	.	.
3	0.22	0.17	0.15	.
4	0.39	0.25	0.20	0.05

Notes: Figures in the Table are fractions of unity and represent weighted averages of average treatment effects of the treated (ATT) and negative average treatment effects of the untreated (ATU).

Table 32: AVERAGE TREATMENT EFFECT (ATE) OF MORE VERSUS LESS PEIAS ON LOG POSITIVE BILATERAL ECONOMIC ACTIVITY (BASED ON 5-PEIA MODEL LONG-RUN RESULTS

♯ PEIAs of Treated	♯ PEIAs of Controls 0	1	2	3
ATE on log positive goods exports				
1	1.90	.	.	.
2	2.99	2.14	.	.
3	3.44	3.51	1.84	.
4	3.66	3.66	2.81	0.93
ATE on log positive services exports				
1	1.08	.	.	.
2	1.04	0.92	.	.
3	.	0.15	0.42	.
4	.	2.05	1.31	0.61
ATE on log positive outward FDI				
1	1.65	.	.	.
2	2.37	0.47	.	.
3	1.23	-1.09	.	.
4	.	0.49	.	0.30

Notes: Figures in the Table are weighted averages of average treatment effects of the treated (ATT) and negative average treatment effects of the untreated (ATU) on log bilateral economic activity.

Table 33: Dynamic treatments

ATT	Switch (from-into)	# Treat	Outocme
-1.668	00001-00000	49	log Goods trade (lgt)
.	00001-00000	0	log Service trade (lst)
-2.705	00001-00000	10	log FDI stocks (lfdi)
-.019	00001-00000	52	P(goods trade>0)
-.035	00001-00000	50	P(service trade >0)
.065	00001-00000	52	P(FDI stocks >0)
-.099	00001-00000	48	lgt_{t+1}–lgt_t
.107	00001-00000	47	lgt_{t+2}–lgt_t
.	00001-00000	0	lst_{t+1}–lst_t
.	00001-00000	0	lst_{t+2}–lst_t
.266	00001-00000	8	lfdi_{t+1}–lfdi_t
-.107	00001-00000	6	lfdi_{t+2}–lfdi_t
2.770	00000-00001	97	log Goods trade (lgt)
.	00000-00001	0	log Service trade (lst)
1.592	00000-00001	9	log FDI stocks (lfdi)
.027	00000-00001	99	P(goods trade>0)
.000	00000-00001	99	P(service trade >0)
-.048	00000-00001	99	P(FDI stocks >0)
.400	00000-00001	95	lgt_{t+1}–lgt_t
.120	00000-00001	96	lgt_{t+2}–lgt_t
.	00000-00001	0	lst_{t+1}–lst_t
.	00000-00001	0	lst_{t+2}–lst_t
-.171	00000-00001	9	lfdi_{t+1}–lfdi_t
.481	00000-00001	9	lfdi_{t+2}–lfdi_t

Table 34: Dynamic treatments

ATT	Switch (from-into)	# Treat	Outocme
.868	00000-00100	372	log Goods trade (lgt)
.	00000-00100	15	log Service trade (lst)
.677	00000-00100	79	log FDI stocks (lfdi)
-.013	00000-00100	378	P(goods trade>0)
.032	00000-00100	370	P(service trade >0)
-.499	00000-00100	378	P(FDI stocks >0)
.062	00000-00100	345	$\text{lgt}_{t+1}-\text{lgt}_t$
.652	00000-00100	310	$\text{lgt}_{t+2}-\text{lgt}_t$
.	00000-00100	13	$\text{lst}_{t+1}-\text{lst}_t$
.	00000-00100	7	$\text{lst}_{t+2}-\text{lst}_t$
.169	00000-00100	73	$\text{lfdi}_{t+1}-\text{lfdi}_t$
.670	00000-00100	65	$\text{lfdi}_{t+2}-\text{lfdi}_t$
-1.568	00100-00110	111	log Goods trade (lgt)
.	00100-00110	0	log Service trade (lst)
-1.755	00100-00110	4	log FDI stocks (lfdi)
-.049	00100-00110	119	P(goods trade>0)
.000	00100-00110	113	P(service trade >0)
-.169	00100-00110	119	P(FDI stocks >0)
.539	00100-00110	110	$\text{lgt}_{t+1}-\text{lgt}_t$
-.125	00100-00110	110	$\text{lgt}_{t+2}-\text{lgt}_t$
.	00100-00110	0	$\text{lst}_{t+1}-\text{lst}_t$
.	00100-00110	0	$\text{lst}_{t+2}-\text{lst}_t$
.110	00100-00110	4	$\text{lfdi}_{t+1}-\text{lfdi}_t$
2.765	00100-00110	4	$\text{lfdi}_{t+2}-\text{lfdi}_t$

Table 35: Dynamic treatments

ATT	Switch (from-into)	# Treat	Outocme
3.293	00000-10000	16	log Goods trade (lgt)
.	00000-10000	0	log Service trade (lst)
1.610	00000-10000	2	log FDI stocks (lfdi)
-.169	00000-10000	20	P(goods trade>0)
.000	00000-10000	18	P(service trade >0)
-.019	00000-10000	20	P(FDI stocks >0)
.239	00000-10000	15	lgt_{t+1}–lgt_t
-.151	00000-10000	16	lgt_{t+2}–lgt_t
.	00000-10000	0	lst_{t+1}–lst_t
.	00000-10000	0	lst_{t+2}–lst_t
-1.109	00000-10000	1	lfdi_{t+1}–lfdi_t
-.956	00000-10000	2	lfdi_{t+2}–lfdi_t
-.003	10000-10100	58	log Goods trade (lgt)
.	10000-10100	0	log Service trade (lst)
3.341	10000-10100	9	log FDI stocks (lfdi)
.227	10000-10100	58	P(goods trade>0)
.000	10000-10100	52	P(service trade >0)
-.009	10000-10100	58	P(FDI stocks >0)
.229	10000-10100	51	lgt_{t+1}–lgt_t
-.624	10000-10100	48	lgt_{t+2}–lgt_t
.	10000-10100	0	lst_{t+1}–lst_t
.	10000-10100	0	lst_{t+2}–lst_t
.	10000-10100	6	lfdi_{t+1}–lfdi_t
.	10000-10100	4	lfdi_{t+2}–lfdi_t
1.970	00100-11100	43	log Goods trade (lgt)
.364	00100-11100	13	log Service trade (lst)
.381	00100-11100	28	log FDI stocks (lfdi)
.013	00100-11100	43	P(goods trade>0)
.274	00100-11100	43	P(service trade >0)
.375	00100-11100	43	P(FDI stocks >0)
-.005	00100-11100	41	lgt_{t+1}–lgt_t
-.173	00100-11100	17	lgt_{t+2}–lgt_t
.465	00100-11100	12	lst_{t+1}–lst_t
.	00100-11100	0	lst_{t+2}–lst_t
.032	00100-11100	26	lfdi_{t+1}–lfdi_t
.082	00100-11100	7	lfdi_{t+2}–lfdi_t

Table 36: DYNAMIC TREATMENT BEHAVIOR 1 (MOST FREQUENT CASES)

	Combinations (2 Switches)		
#	initial treat	switch into	switch into
59	00000	00100	00110
49	00000	00010	00110
49	00000	10000	10100
28	00000	00100	11100
22	00100	00110	11110
17	00000	00001	00000
10	00100	00000	00100

Table 37: DYNAMIC TREATMENT BEHAVIOR 2 (MOST FREQUENT CASES)

	Combinations (3 Switches)			
#	initial treat	switch into	switch into	
9	00000	00010	00110	11110
7	00000	00001	00101	11101
6	00000	00100	00101	11101
6	00000	00100	00110	10110
4	00000	00010	00110	10110
3	00000	00100	11100	11101
3	00100	00000	00010	00110

Table 38: DYNAMIC TREATMENT BEHAVIOR 3 (MOST FREQUENT CASES)

		Combinations (4 Switches)			
#	initial treat	switch into	switch into	switch into	switch into
3	00000	10000	10100	10110	11110
2	00000	00001	00000	00100	11100
2	00000	00100	00110	10110	00110