The New Regionalism and Policy Interdependence

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Abstract

Over the last twenty years, the number of bilateral and regional preferential trade agreements in existence has increased very rapidly. Explanations of this development emphasize factors such as the spread of democracy, deadlock in multilateral trade negotiations, and learning. Our argument is that policy diffusion as a result of competition over market access is a major driving force behind what has become known as the "new regionalism". The causal reasoning is that facing trade diversion, exporters excluded from a preferential trade agreement are likely to mobilize and push their government into signing an agreement with the country in which their exports are threatened. We test our argument against alternative explanations in a quantitative analysis of the proliferation of preferential trade agreements among 168 countries between 1990 and 2007. By showing that competition is indeed a major cause of the new regionalism, the paper contributes to the literatures on regionalism and policy diffusion.

Key words: preferential trade agreements, policy diffusion, interest groups, spatial interdependence, Cox model.

INTRODUCTION

A casual overview of major trade policy developments over the last two hundred years suggests that preferential trade policies are contagious. The Cobden-Chevalier agreement between France and the United Kingdom (1860) was the first of a large number of preferential trade agreements that were concluded in the second half of the nineteenth century.[1] In the interwar years, major European powers moved in parallel to establish sizeable preferential trading systems with their colonies. The 1960s saw the spread of regional trade agreements that clearly were a response to the creation of the European Economic Community (1958). Finally, since the early 1990s many countries in the world have decided to adopt preferential trade policies, leading to the sharp increase in the number of preferential agreements in existence that is known as the "new regionalism".[2]

Several potential explanations exist for these developments. Different countries concluding preferential trade agreements at the same time may be the result of a "domino effect".[3] In this view, the negative externalities from the conclusion of an agreement make excluded countries scramble for new agreements.[4] Alternatively, learning and the spread of ideas may make countries adopt similar trade policies at the same time. Still another explanation for parallel trade policy choices can be found in the security externalities that trade can have.[5] If a trade agreement provides security benefits to participating countries, in an anarchic world in which all countries strive for survival, excluded countries will be pushed to conclude agreements as well. Moreover, if democracies find it beneficial to conclude preferential trade agreements, a spread of democracy may create the impression of contagion

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[1] Lazer 1999; Pahre 2008.
[2] Mansfield and Milner 1999.
[3] Baldwin 1993.
[4] See for example, Oye 1992; Mansfield 1998; Lazer 1999; Gruber 2000; Manger 2005; Dür 2007b.
[5] Gowa 1994; Skålnes 1998.

among trade policies.[6] Finally, developments in the international trading system may create incentives for all or many countries to pursue similar trade policies.[7] For instance, stagnation of the process of multilateral trade liberalization may stimulate several countries at the same time to pursue preferential trade policies. In short, a variety of explanations exist that at first sight provide plausible accounts of the empirical observations outlined above.

In this paper, building on the "domino theory" proposed by Richard Baldwin[8], we argue that the proliferation of preferential trade agreements over the last two decades is an indication of policy interdependence. Countries excluded from a preferential trade agreement react by signing their own agreements, thus driving the phenomenon that we know as the new regionalism. What we add to this explanation is a logic that makes explicit the political processes at the domestic level that impel the domino effect. The puzzle is that before facing commercial discrimination, excluded countries are satisfied with the *status quo*, but once they feel the negative effects of a preferential trade agreement from which they are excluded, their trade-policy orientation changes. What are the underlying domestic political processes that drive this change in trade-policy orientation? Our response is that exporters lobby more against losses of foreign market access than in favor of opportunities, hence causing a shift in the balance of domestic interests once a country faces discrimination abroad.

We test this argument against alternative explanations in a quantitative analysis of the proliferation of preferential trade agreements among 168 countries between 1990 and 2007. In this empirical analysis, rather than only show that preferential trade agreements are contagious, our aim is to show *why* they are so: because of competitive pressures, emulation, or security externalities? In carrying out the analysis, we introduce several improvements

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[6] Mansfield et al. 2002.
[7] Mansfield and Reinhardt 2003.
[8] Baldwin 1993; 1997; 2006.

with respect to data and method to the quantitative literature on preferential trade agreements. Most importantly, we invested substantial effort in establishing an authoritative list of trade agreements. We also were very cautious in operationalizing our variables in order to allow for an analysis that comes as close as possible to testing our causal mechanism. The findings provide strong support for our argument. The choice by different countries to enter preferential trade agreements is indeed interdependent; and the interdependence increases as the negative externalities from existing agreements increase.

The paper hence is of relevance to the literature on regionalism in the world economy. At the same time, we also make a contribution to a growing literature on policy diffusion and policy interdependence.[9] Increasingly, scholars of international political economy realize that dyads are not independent of each other, and try to model the interdependence among them.[10] Policy interdependence, for example, has been shown to be a driving force of the diffusion of bilateral investment treaties.[11] We add to this literature by taking seriously a recent call for accepting that "space is more than geography"[12] when establishing the spatial weights matrix that is used to examine policy diffusion. Moreover, we introduce a new way of measuring the degree of dependence among two observations, which includes attention to extra-dyadic relationships.

In the following, we first briefly outline the existing literature on the spread of preferential trade agreements. This discussion shows that a large number of different explanations for the new regionalism exist. We then establish our argument that focuses on attempts at regaining market access as driving factor behind the sharp increase in the number of preferential agreements over the last twenty years. After discussing our data and approach

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[9] See for example, Gleditsch and Ward 2000; Braun and Gilardi 2006; and Franzese and Hays 2008.
[10] Neumayer and Plümper 2008.
[11] Elkins et al. 2006.
[12] Beck et al. 2006.

to testing the argument, we present our empirical findings. In the conclusion, we stress the implications of our findings for studies on new regionalism and policy interdependence.

EXPLAINING THE NEW REGIONALISM

Over the last fifteen years, the number of dyads forming part of a preferential trade agreement has increased sharply (see Figure 1). While in 1990, only about 250 pairs of countries had a preferential trade agreement between them, the number stood at 1829 in 2007.[13] With 14,028 dyads in our dataset in 2007[14], this means that no fewer than 13 percent of all dyads have a preferential trade link among them. Obviously, the European Union, owing to its large number of member countries and agreements concluded with third countries, accounts for a sizeable number of these dyads. The signature of the EU accession treaties with ten Central and Eastern European countries, for example, explains a large part of the peak in agreements signed in 2003. This does not mean that the process is limited to the EU, however. Our data show that across the world, the number of agreements being signed is increasing. In particular, there is a growing number of South-South agreements and of agreements involving Asian countries. Moreover, the EU's increasing membership and continued attractiveness as partner for preferential trade agreements is itself support for our argument.

FIGURE 1 APPROXIMATELY HERE

What explains this proliferation of preferential trade agreements across the world? A sizeable literature has been written that provides a series of different responses to this

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[13] Below we explain in some detail how we arrive at these numbers.
[14] Since some countries, for example states in the area of the former Soviet Union, enter the dataset later than 1990, only 13,800 dyads are included for the whole period.

question. We distinguish five broad explanations, stressing the spread of ideas and emulation, geopolitical balancing, common external shocks, common changes at the domestic level, and competitive pressures. A first explanation for the new regionalism stresses the spread of ideas and emulation. If specific trade policy ideas influence the trade policies of different countries at the same time, such countries may all move in the same direction, giving the impression of policy interdependence. Charles Kindleberger, for example, contended that the period of free trade that Europe experienced in the nineteenth century was a result of the spread of free trade ideas. In his words, "the countries of Europe in this period should not be considered as independent economies whose reactions to various phenomena can properly be compared, but rather as a single entity which moved to free trade for ideological or perhaps better doctrinal reasons."[15]

Alternatively, the perceived success of the trade policies of one or several countries may lead to learning and emulation. Again, this would lead to the observation of parallel trade policy choices. Suggesting such an influence, the economist Friedrich List, who in 1819 set up a pressure group to lobby for German economic unification, compared the situation in Germany to that of France: "With envious eyes [traders from Germany] gaze across the Rhine where a great nation can trade freely from the Rhine to the Pyrenees, from the Dutch frontier to Italy without meeting with a single customs-house officer."[16] In the debate over Great Britain's unilateral adoption of free trade in the first half of the nineteenth century, the argument that this would induce other countries to follow suit again had a prominent place.[17] The principal idea was that other countries would perceive the benefits Great Britain accrued from its free-trade policy and thus be convinced to follow the same course of action. Finally,

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[15] Kindleberger 1975, 51.
[16] Cited in Birnie 1930, 72.
[17] O'Brien 1976, 553.

the economic successes of the member countries of the European Economic Community might have motivated economic integration in Latin America and Africa in the 1960s.[18]

Second, a spread of preferential trade agreements may result from the need for balancing the trade-policy choices of other countries. Neorealist International Relations theory argues that the anarchic structure of the international system makes states apprehensive of increases in the power of other states, as these states may use their new capabilities to attack them.[19] Since preferential trade agreements that stimulate trade flows may increase the wealth and hence the power of a country, excluded countries may be concerned about such agreements.[20] An agreement between two countries may thus force other dyads to follow suit, to retain their current relative position vis-à-vis these countries. According to this view, what we should witness is the development of rival trade blocs that mirror security alliances.

Third, parallel trade policy choices can be a result of external shocks that affect all countries in the system equally. The stagnation of the multilateral process of trade liberalization, for example, may create incentives for states to pursue preferential trade liberalization. Realizing that they cannot achieve better access to foreign markets by way of a multilateral trade agreement, exporters in different countries may decide to lobby their governments for the pursuit of preferential trade agreements. Alternatively, states may be pushed to sign preferential trade agreements during multilateral trade talks, as such agreements may increase their bargaining power at the level of the World Trade Organization.[21] The drawn out negotiations in the Uruguay Round and in the Doha Development Agenda hence may explain the current proliferation of preferential trade

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[18] Pomfret 2001, 358.
[19] Waltz 1979.
[20] Gowa 1994.
[21] Mansfield and Reinhardt 2003.

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agreements. A final external shock that may explain the spread of preferential trade agreements is the reduction of trade distance as a result of technological progress. Previous research has shown that the distance between two countries and the remoteness of a dyad from the rest of the world can explain whether a dyad forms part of the same trade agreement.[22] A decrease in trade distance hence may explain the boost in the number of trade agreements that we observe over the last two decades.

Fourth, there may be changes at the domestic level that affect different countries at the same time. Existing research has shown that democratic dyads are more likely to sign a preferential trade agreement.[23] The theoretical rationale given for this finding is that democratic governments may use trade agreements as a signaling device vis-à-vis domestic constituents. Following this view, the spread of democracy since the 1980s, which saw countries in Latin America, Central and Eastern Europe, and Asia move towards democracy, may thus explain the concurrent proliferation of preferential trade agreements.

Finally, competition for market access may explain the proliferation of trade agreements. In this view, preferential trade agreements impose costs on excluded countries, making the latter eager to join or to set up a rival agreement. Following this line of reasoning, Kenneth Oye argued that discriminatory trade policies in the 1930s and the 1980s had the unintended consequence of promoting further openness.[24] Lloyd Gruber proposed that the North American Free Trade Agreement (1994) was a consequence of Mexico's reaction to the creation of the Canada-United States free trade agreement (1988).[25] Marc Manger demonstrated that Japan concluded a trade agreement with Mexico because it feared

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[22] Baier and Bergstrand 2004.
[23] Mansfield *et al.* 2002.
[24] Oye 1992.
[25] Gruber 2000.

exclusion from the North American Free Trade Agreement (NAFTA, 1994).[26] Finally, Andreas Dür showed how European discriminatory trade policies in the 1930s and the 1960s led to an American reaction.[27] In the following, we provide an argument that builds on these studies.

THE PROTECTION-FOR-EXPORTERS ARGUMENT

The protection-for-exporters argument that we set out to explain the spread of trade agreements over the last two decades builds on the "domino theory of regionalism".[28] At its most general, this theory postulates that preferential trade policies hurt outsiders by way of trade diversion.[29] Outsiders then feel compelled to react, either by joining a preferential trade agreement or by setting up an alternative one. Over time, this leads to the spread of preferential trade agreements.

This idea has been developed in most detail by Richard Baldwin.[30] Baldwin starts from a political economy model according to which governments maximize a function of interest-group donations, general welfare, and support from groups that oppose membership for non-economic reasons. To explain why governments react to losses rather than maximize gains, Baldwin assumes that losers from policies lobby more than do winners because winners cannot profit from their gains in a competitive setting. He legitimizes this assumption by arguing that if returns to investments increase in a sector, more firms will be attracted to that sector, increase competition, and cause gains to be lost again. Consequently, there is no incentive to lobby for gains; exporters will become active only when facing losses, such as those stemming from foreign preferential trade policies. This logic, however, is

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[26] Manger 2005.
[27] Dür 2007b.
[28] Baldwin 1993.
[29] For the concept of trade diversion, see Viner 1950.
[30] Baldwin 1993; 1997; 2006.

challenged by the fact that many industries are characterized by high barriers to entry. Among them are not only declining sectors, but also ones that are able to export exactly because they gain oligopolistic rents in the home market. Such industries, therefore, will favor voice over exit with or without foreign discrimination. Following this explanation, whether or not an industry lobbies should be determined by the industry's barriers to entry of new capital, but not by its trade orientation (that is, whether it is an exporting or an import-competing sector).

We formulate a slightly different explanation that resolves this problem. The resulting "protection-for-exporters" argument assumes the existence of two trade policy constituencies, exporters and import-competitors. Exporters benefit from better foreign market access and import-competitors from continued protection of their sector against foreign competition. While import-competitors tend to be highly mobilized in defense of their interests, we expect exporters in most circumstances to be hardly politically active. The reason is that they face substantial uncertainty with respect to the potential benefits from engaging in lobbying for better foreign market access. Not only do they face the uncertainty of whether they will be able to convince their own government to pursue their preferences (an uncertainty that is shared by import-competitors), but they also face uncertainty about the willingness of a foreign government to reduce its trade barriers. The uncertainty is even further enhanced by the fact that trade negotiations tend to go on over quite a substantial time, making it difficult to know the competitive situation of an exporter at the time the agreement enters into effect. As a result, it is difficult for an exporter to predict whether she or rather another exporter from the same country (or an exporter from another country that may also benefit from trade liberalization) will reap the benefits of better foreign market access.

In short, uncertainty strongly inhibits exporters' lobbying for gains. In this situation, even if some exporters manage to overcome the uncertainty and become politically active, the balance of domestic interests will be biased in favor of import-competing interests. It seems reasonable to expect that a government will take into account this balance of interests when formulating its trade policy, even if domestic interests do not perfectly translate into government policies.[31] The balance of domestic interests is an important consideration for decision-makers that want to stay in power because organized interests that are dissatisfied with government policy will try to mobilize the public. The expectation hence is for governments to pursue policies that satisfy import-competing interests, even if they do not close their markets completely as there always are some offsetting pressures from the broad public that cares about economic efficiency and producers who depend on imports. For the puzzle at hand, the prediction is for few regional trading arrangements to come into existence under these circumstances.

Exporters' incentives to mobilize are substantially different when facing losses, caused, for example, by the creation of a preferential trading arrangement among foreign countries. In this situation, rather than having to invest in monitoring foreign markets to gather information about export opportunities, they can simply react in a fire-brigade manner to any losses they experience form the trade policy choices of foreign countries. Moreover, they can be quite certain about the consequences of their lobbying activity. If they manage to achieve the re-establishment of the market conditions that existed before the creation of the preferential trade agreement, they should be able to regain their share of that market. Exporters' uncertainty of lobbying against losses, consequently, is lower than the uncertainty of lobbying for gains. The expectation derived from this argument is that a

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[31] This assumption is common to a large number of studies in the field of International Political Economy. See, for example, Milner 1988; Gilligan 1997; Chase 2005.

stronger lobby effort by exporters should be visible in response to losses.[32] To the extent that governments are receptive to changes in the relative balance of different interests in a country, this shift in the domestic balance of interests should give more prominence to exporter concerns in the country's trade policy. In particular, we expect that the country should enter into negotiations for a trade agreement with the country in which exporters face a loss of market access.

The strength of the effect just set out depends on the amount of trade diversion that an agreement causes for an excluded country. The amount of trade diversion, in turn, depends on the extent to which the exporters of the excluded country directly compete with a member country of a preferential trade agreement in the market of the other member country. Simplifying, it can be expected that an agreement between two developed countries will have a high pull effect for other developed countries, but a low pull effect for developing countries. An agreement between two developing countries, by contrast, will have the largest effect on other developing countries. A North-South agreement, finally, should stimulate other agreements between developed and developing countries. The logic also suggests that the impact of a preferential agreement should be particularly severe for countries that see a significant amount of their exports go to one of the member countries. The reason is that the larger the share of exports concerned, the larger the potential costs, and the larger also the political power of the exporters concerned. Summarizing, this means that the likelihood of an agreement between countries A and B increases as the number of preferential trade agreements A and B form part of increases; the share of exports from A going to B and B going to A increases; and the degree of competitiveness between the

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[32] The same expectation of mobilization against losses can be derived from prospect theory (Kahneman and Tversky 1979; Fannis 2004). According to prospect theory, actors are more willing to engage in risky behaviour if they expect losses. While in this paper we cannot empirically test the two approaches against each other, we find the approach based on uncertainty theoretically more appealing.

exports of A (B) and the partner countries (C, D,…) of the other side increases. In the form of a hypothesis:

Hypothesis: The probability of a preferential trade agreement between two countries increases as the number of preferential agreements in which each of them participates and the discriminatory trade effects of these agreements increases.

It is important to stress that our argument leads to the expectation that *both* conditions included in this hypothesis are necessary for the diffusion effect to come about. Preferential trade agreements should not have an effect on the trade policy choices of third countries unless they generate trade diversion. If we were to see that preferential agreements spread to countries that do not suffer from trade diversion, this would be an indication that alternative diffusion mechanism are at play, a question that we take up below.

Any explanation relying on a domino effect begs the question of what the initial stimulus for the domino effect is, that is, what makes the first domino stone fall. The endogenous explanation is that in some cases, governments may be able to design an agreement that imposes costs on third countries rather than domestic import-competing interests. In such a case, in the absence of lobbying by import-competitors, governments may have an incentive to conclude an agreement.[33] An initial agreement should be particularly probable between adjacent countries, as in such a case exporters' uncertainty about the potential benefits of such a move is likely to be smallest. For some agreements, an

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[33] Grossman and Helpman 1995, 680.

explanation may also require consideration of exogenous factors, such as the geopolitical interests of countries.

Countries could also be expected to conclude preferential trade agreements because they expect to benefit from the external effect that we describe here. In fact, there are some historical examples of countries using preferential trade agreements to put pressure on third countries. Some evidence, for example, suggests that the Asian and Pacific countries may have used the threat of preferential liberalization as part of the Asia Pacific Economic Cooperation (APEC) to force the EU into accepting the conclusion of the Uruguay Round.[34] The empirical record, however, suggests that in many cases, decision-makers did not anticipate the external consequences of a preferential trade agreement. In some cases, they even were surprised by these effects. Few people, for example, had predicted that the deepening of European integration in the 1980s would have a major pull effect on third countries, which led to the creation of the European Economic Area and the negotiation of a series of Mediterranean agreements.

An aspect of the argument that we have ignored so far is why a member country of a preferential agreement (country A) should accept the conclusion of a trade agreement with an excluded country (country B). As country A recently concluded a preferential agreement with country C, it could be hypothesized that its domestic interests will not lobby in favor of another agreement. Import-competitors will be particularly sensitive about a further agreement at a time when they suffer from the consequences of the initial agreement, while exporting interests will be eager to exploit the new market opportunities. Our argument is that country A will accept an agreement only if its exporters face losses in country B (the

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[34] Richardson 1993.

inverted logic) or because country B is so eager to reach an agreement with A that it is willing to make major concessions.

Although we have formulated our argument using the example of *bilateral* agreements, the logic also applies to *plurilateral* preferential agreements. For exporters in third countries, a multilateral agreement has the same effect as a set of bilateral agreements: it threatens access to several markets at the same country. A multilateral agreement between countries A, C, D, and E therefore is likely to have a major pull effect on country B, if it has major export interests in at least one of these markets and its exports are in competition in that market with those from at least one of the other member countries. The precise reaction of country B to this plurilateral agreement will depend on its export interests. If its exports are concentrated in A, it will conclude a bilateral agreement with that country. If it has export interests in more than one of these markets, however, it may decide to join the existing agreement. This is the explanation that we provide for the repeated rounds of enlargement of the European Union.

What we do no consider in this paper is that a country may react to discrimination in ways other than signing a trade agreement with one of more of the member countries of a preferential agreement. For one, it may threaten with retaliation against countries that impose costs on its exporters. When the European Union moved towards a deepening of integration in the late 1980s, the U.S. responded with threats to all proposals that had the potential of imposing costs on its exporters. Such threats can only be used by structurally powerful countries, however. Weaker countries responded to the Single Market Program with requests for bilateral agreements, as set out in this paper. A second possible response to discrimination is a call for multilateral trade liberalization. Again the U.S. reaction to European integration best illustrates this tactic. The creation of the European Economic

Community in the late 1950s caused concern among American exporters. Instead of signing a preferential agreement with the new trading entity, the U.S. used the Kennedy Round of world trade negotiations (1964-67) to reduce the discrimination resulting from the European move.[35] Finally, a government may decide to compensate exporters that face costs from trade diversion by way of a subsidy. World trade rules, however, impose strict limits on the use of subsidies; governments violating these rules have to fear the imposition of countervailing duties. Disregarding these alternative tactics leads us to underestimate the external effect of preferential trade agreements.

DATA AND OPERATIONALIZATION

Only very few studies have tried to quantitatively test the basic idea underlying the argument about interdependence in the creation of preferential trade agreements.[36] What is more, these existing studies are characterized by a series of shortcomings. Early quantitative studies, for example, did not explicitly model the spatial correlation at the heart of the theoretical argument. More recent studies using spatial weights matrixes either restrict the analysis to a small sample of countries or take a cross-section approach.[37] By using time-series rather than cross-sectional data, establishing an authoritative list of trade agreements, designing a quantitative test that captures the trade diversion logic that underlies our argument as closely as possible, and controlling for alternative diffusion mechanism, we improve on the existing literature with respect to both data and operationalization.

We test our argument on a database of preferential trade agreements among 168 countries between 1990 and 2007. As is evident from Figure 1 above, relatively few

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[35] Dür 2008.

[36] Among the exceptions are Mansfield 1998; Rieder 2006; Egger and Larch 2008.

[37] Rieder (2006) restricts the analysis to 25 developed countries and Egger and Larch (2008) adopt a cross-section approach.

agreements were signed before 1990, legitimating our choice to start the analysis in that year. Starting in 1990 also makes sense from a methodological point of view. By extending the dataset to the years before 1990, we would have to tackle the fact that the Cold War environment was quite distinct for most countries than the post-Cold War environment. As Kevin Clarke has forcefully shown, including control variables to deal with omitted variable bias associated with such a shift may increase rather than reduce this bias.[38] We thus follow his recommendation of substituting research design for control variables by limiting the dataset to the post-Cold War period. With respect to country coverage, while we have tried to include as many countries as possible in our analysis, we had to exclude some (mostly very small) countries owing to data restrictions. This leads to the elimination of a few dyads with preferential trade agreements, especially in the Caribbean region. We also exclude Montenegro as it only came into existence in 2006 and hence would have been in the database for only two years. A few other countries that became independent after 1990 enter the database in the year of their independence.

The dyads included in the analysis are non-directional, that is, we do not distinguish between the country pair Albania-Argentina and the reverse country pair Argentina-Albania. The reason for using non-directed dyads is that we do not know which country started the negotiations for a preferential trade agreement. While in single case studies it may be possible to find out exactly which country made the first step in calling for a trade agreement, doing so for the large number of agreements included in our analysis is not practical. What is more, using non-directed dyads makes sense from a theoretical point of view: we expect an agreement to come about only if both countries feel some pressure to engage in negotiations. In most cases, therefore, we would expect the future member countries to

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[38] Clarke 2005.

informally agree on the need for an agreement before they formally launch the negotiations. In total, we consider up to 14,028 dyads per year for a total number of 225,833 observations.

The dependent variable in our analysis is whether two countries sign a preferential trade agreement in a specific year. We opted for the year of signature rather than the year of entry into force of an agreement, as signing an agreement is an important indication that governments respond to exporter lobbying. The year of signature is also important for the effect that agreements have, since it is in this moment that exporters in third countries should become worried about the potential negative consequences for them. We invested substantial effort in establishing an authoritative list of trade agreements signed between 1990 and 2007. Using three different databases, namely the list of regional trade agreements notified with the World Trade Organization, the Tuck Trade Agreements Database, and the McGill Faculty of Law Preferential Trade Agreements Database, but excluding partial-scope agreements and agreements that include no preferential treatment, we find that 1600 dyads formed a preferential trade agreement between 1990 and 2007.[39]

For our analysis, we also needed to know which dyads already formed part of a preferential trade agreement in 1990, since dyads with an agreement drop out from our analysis. Our database hence includes all agreements effectively implemented between 1945 and 1989 that were still in existence in 1990, and all new agreements signed between 1990 and 2007. We exclude a few agreements from our database that formally were in existence in 1990 but had not been effectively implemented. Examples are the Latin American Integration Association, which did not lead to any significant preferential tariff reductions, and the Economic Community of Central African States (until 1993, when member countries signed a revised agreement). Such agreements, which only exist on paper, do not

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[39] These databases are available at http://www.wto.org/english/tratop_e/region_e/summary_e.xls; http://www.dartmouth.edu/~tradedb/; and http://ptas.mcgill.ca/ [all last accessed August 18, 2008].

have an external effect, and thus should not contribute to the domino effect we are interested in. The agreements that we consider to be effectively implemented with discriminatory consequences as of 1 January 1990 are: the EU; the European Free Trade Association (EFTA); the agreements between the EU and EFTA countries; the agreements between the EU and Cyprus, Israel, and Malta; the agreements between the U.S. and Canada and Israel; the Caribbean Community; and the South African Customs Union.

We do not consider second or third agreements signed between two countries. This is an important restriction especially for European dyads, where we see a stepwise deepening of integration. We also see a transformation of bilateral agreements between the European Union and third countries across Europe into accession treaties. All Central and Eastern European countries, for example, signed bilateral free trade agreements with the EU in the early 1990s. Since dyads are ignored once they concluded an agreement, events such as the accession to the EU of ten of these countries in 2004 do not figure in our analysis. While the deepening of integration can have effects similar to those captured by our theoretical argument (and can be a reaction to preferential trade agreements among third countries), we decided to exclude these cases from our analysis to secure unit homogeneity (as the political economy of deepening an agreement may be slightly different from the political economy of an initial agreement). More generally, by opting for a dichotomous dependent variable, we abstract from the fact that some preferential agreements are more far-reaching, and hence potentially more trade-diverting, than others.

Policy Diffusion: Competition and Emulation

The model that we estimate includes a spatial weights matrix and control variables for both the dyad under consideration and potential external shocks. We thus estimate the following equation:

$$y_{it} = \beta x_{it} + \delta w_i y_{t-1} + \varepsilon_i \tag{1}$$

where β and δ are the coefficients and w_i is the ith row of the spatial weights matrix. We use three different approaches to estimate this model. First, in line with earlier research, we estimate a Cox proportional hazards model, adjusted for clustering on dyads.[40] The advantage of using the Cox model is that it does not require any assumption about the shape of the underlying survival distribution. As is common practice in recent research on the statistical analysis of panel data with a binary dependent variable, we base significance test on Huber (robust) standard errors.[41] These standard errors can take account of possible heteroskedasticity (serial correlation) or *intra-group* correlation of the data. Second, we use a frailty model (Gamma distributed) to control for the heterogeneity *between groups*, which turns out to be statistically significant in our case. As Janet Box-Steffensmeier and Bradford Jones argue, heterogeneity can result from the omission of relevant variables.[42] Not dealing with heterogeneity can lead to an underestimation of the effect of covariates that increase the hazard rate and an overestimation of the effect of covariates that reduce the hazard rate. Finally, since our dataset is heavily zero-inflated, we also estimate the models using a rare events logistic regression.[43] The use of this approach is recommended since common logistic regression underestimates the impact of the explanatory variables on the probability of the rare event. In addition, there is the risk that the standard errors are biased with a large number of zeros in the dependent variable.

The main independent variable is an N*N*t spatial weights (also called connectivity) matrix. A spatial weight matrix measures the impact of a policy change in a dyad on all other

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[40] The study by Elkins et al. on the diffusion of bilateral investment agreements is also based on the Cox model. Darmofal (forthcoming) provides an extensive analysis of the use of survival models with spatial effects.
[41] Beck 2008, 486.
[42] Box-Steffensmeier and Jones 2004, 141.
[43] In our dataset, only about 0.7 percent of the dyads have a score of 1.

dyads. It weighs the policy change by specific factors, such as spatial proximity or degree of economic interdependence. In our case, the policy change is whether a dyad signed an agreement in the last five years. We opt for a five year period as we think that while it may take some time for exporters in third countries to react to the creation of a preferential trade agreement, and for this reaction to have an impact on the trade policies of a country, after some time the external effect of a preferential trade agreement should disappear. After five years, exporters will either have been successful in convincing their government to reach an agreement with the members of a preferential trade agreement or will have adapted to the new situation.

We weigh the influence of the policy change in other dyads in a way that approximates the trade diversion logic as directly as possible. The hypothesis set out above leads us to the expectation that the pressure on country B to respond to a preferential trade agreement between countries A and C by signing an agreement with A should depend on the importance of market A for B and the degree of competition between the exports to A by B and C. In form of a formula, the spatial weight for dyad AB is as follows:[44]

$$k_{ab} = \sum_{c,d,...}\left[\frac{e_{ab}}{c_{a\_c,d...}} * n_{b\_c,d,...}\right] + \sum_{k,l,...}\left[\frac{e_{ba}}{c_{b\_c,d...}} * n_{a\_c,d,...}\right] \qquad (2)$$

where k_{ab} is greater than 0 if countries A and B are connected. In this formula, e is the share of a country's exports going to the other country, c is the degree of competition between two countries and n a variable that takes on the value 1 if country A (B) signed an agreement with countries C, D, and so on between one and five years ago. The variable is lagged by one year

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[44] The spatial matrices have been calculated using the software MATLAB 7.0 employing a program designed by the authors for this purpose. Although frequently done in the literature (see Freanzese and Hays 2008, 580), we do not row-standardize our connectivity matrix since we do not have any theoretical reason to do so and since row-standardization may influence the results and may impact inference (see Plümper and Neumayer 2008, 26).

to avoid simultaneity bias. This may lead to an underestimation of the spatial effect, if countries already react to other countries' negotiations of preferential trade agreements. An example of this would be African countries that initially are reluctant to sign an Economic Partnership Agreement with the EU, and then still jump on the bandwagon as they fear exclusion from agreements signed by the EU and other African countries. The subscripts a, b, and so on denote the countries.

The formula has two parts: the first part assesses the pressure on A resulting from B's trade agreements and the second part the pressure on B resulting from A's trade agreements. The additive term captures the idea that the probability that A and B sign an agreement depends on both sides' incentive to conclude one. As set out above, an agreement will only come about if either both countries face exclusion in the other's market or one country faces very large costs and thus will be willing to make major concessions to achieve an agreement.

With respect to the importance of the other country's market, we use dyadic exports as a share of a country's total exports. A potential problem with this is that export shares are partly endogenous to our argument. The share of exports of country A going to country B should decrease as country B signs a preferential trade agreement with country C, at least as long as countries A and C export the same goods. We deal with this endogeneity problem by lagging the matrix by one year. The term used to denote this matrix below is "trade and competition".

One way of measuring the degree to which two countries compete on the same market is to disaggregate trade flows to the sector or even product level and then correlating the direction of trade flows. However, weak trade data for many of the countries that we

include in our analysis made us opt for a proxy measure instead.[45] We use the (natural log of the) difference between the *per capita* Gross Domestic Product (GDP) of countries B and C as a proxy for the extent that these two countries compete in the market of country A.[46] The assumption underlying this operationalization is that countries with a similar GDP per capita have a similar factor endowment and thus should export the same goods. A North-North agreement should have an impact on other Northern countries[47]; a South-South agreement on other Southern countries; and a North-South agreement should make Northern countries conclude an agreement with the Southern and Southern countries with the Northern member of the agreement. For example, the EU should have reacted to the North American Free Trade Agreement by signing an agreement with Mexico, as it exports similar goods to that country as does the US.[48] That it did not sign an agreement with the US also supports our logic, as the EU's exports to the US do not compete with those from Mexico.

Figures 2a and 2b illustrate how this variable changes for two cases. In Figure 2a, we show the spatial weight for the dyad Bolivia and Chile. On November 29, 1990, the Andean Pact (now Andean Community), of which Bolivia is a member but Chile is not, decided to establish a free trade area by January 1993. This decision increased the pressure on Chile to conclude a trade agreement with Bolivia. The pressure on Chile grew even stronger as a result of the September 10, 1994, free trade agreement between Bolivia and Mexico. It is no wonder then that Bolivia and Chile signed an agreement one year later. In Figure 2b, the agreement between the Czech Republic and the EU has only little impact on the dyad Czech

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[45] In fact, even at the aggregate level, dyadic trade data is quite problematic, as it includes many missing values and exhibits major jumps in the time series for less developed countries. See also Gleditsch 2002.

[46] We use natural logarithms of many of the variables, since they are characterized by frequent (economic and geographical variables) or occasional (spatial variables) large observations.

[47] Intra-industry trade, which is important between developed countries at a similar stage of development, lowers the potential for trade diversion. The operationalization used here thus makes us overestimate the pressure that preferential agreements among developed countries exert on other developed countries. The results are consequently biased against our argument.

[48] In fact, this is what happened. See Dür 2007a.

Republic – Bulgaria, as Bulgaria is expected to export different goods to the Czech Republic than the then member states of the EU. The pressure on Bulgaria increased as a result of the agreements between the Czech Republic and Latvia (1993) and the accession of Romania to the Central European Free Trade Agreement (CEFTA) in 1997. The logical result was the conclusion of a trade agreement between the Czech Republic and Bulgaria in 1998, as part of the latter country's accession to CEFTA.

FIGURES 2a and b APPROXIMATELY HERE

As indicated above, several alternative causal mechanisms could drive the diffusion of trade agreements. In the empirical analysis below, we control for the possibility that diffusion is a result of emulation or security externalities. Emulation is defined as ritualistically "following or doing oppositely of others".[49] It is most likely among countries that are culturally close. The expectation thus is that the probability of a preferential trade agreement between countries A and B increases, as the number of preferential agreements that A and B participate in increases and the cultural distance between A and B decreases. Building on work by Zachary Elkins, Andrew Guzman and Beth Simmons, we construct three different spatial weights matrices measuring cultural proximity to capture this effect.[50] Each of the matrices uses a different proxy for cultural distance: whether two countries share the same predominant language, predominant religion, and a common colonial past. We also control for the possibility of diffusion resulting from security externality. To capture this effect, we calculate a spatial weight matrix that increases the probability of countries A and B

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[49] Franzese and Hays 2008, 572.
[50] Elkins *et al.* 2006, 831.

signing an agreement if country C, with which B has had a military conflict since World War II, signed a preferential trade agreement with another country in the last five years.

Control Variables

In our models, we also take into account a series of variables that characterize the dyad under analysis and the context in which a dyad considers concluding an agreement. Doing so is vital to avoid overestimating the effect of the spatial lag, as parallel policy choices may be a result of correlated unit-level factors or exogenous shocks that are common to various dyads.[51] Thus, in accordance with previous studies in the field, we include several economic, geographical, and political variables as control variables in our base model. Most of these variables are lagged by one year to avoid endogeneity problems. In the robustness checks below, we add further control variables.

Concerning the economic variables, we control for the amount of trade between the two countries, as previous research has shown that as trade between countries increases, the probability of forming a preferential trade agreement increases as well (*TRADE*). It can also be hypothesized that signing an agreement between two economies of relatively equal size should be easier that signing one between a large and a small economy. Among the reasons to expect such an effect is that the small country may fear becoming overly dependent on the large country and that for the large country the economic benefits of an agreement with a small country are likely to be small. The welfare gains from an agreement may also increase as the parties to an agreement become more similar in economic size.[52] The measure that we use for this variable is the absolute difference in GDP between the two countries (*SIM*).

We also include a measure of the size of the economy of the two countries to capture the idea that the larger the countries participating in a preferential trade agreement,

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[51] Franzese and Hays, 2008.
[52] Baier and Bergstrand 2004.

the larger the economic gains. As Scott Baier and Jeffrey Bergstrand argue, a preferential agreement between two large economies increases the volume of trade in more varieties than one between two small economies.[53] In addition, the larger increase in trade among two large countries causes a larger net expansion of demand and hence a larger rise in real income. We capture this idea by including the GDP of the smaller of the two countries in a dyad (*GDP*). A further factor that potentially influences the likelihood of an agreement between a pair of countries is the level of development. The more developed the two countries, the easier they should find it to conclude an agreement. This is so for two reasons. First, a country with a highly developed economy is less dependent on tariff revenues. Second, a developed country is in a better position to compensate societal groups that face adjustment costs due to trade liberalization.[54] The variable that captures this argument is the absolute difference in GDP per capita (*GDP PER CAPITA*). As with other variables that are measured at the level of the state, we convert this one into a dyadic variable by opting for the lower of the two values as the one characterizing the dyad.

Two control variables capture domestic and international political factors. At the international level, it is quite straightforward to assume that military allies should be more likely to sign an agreement than other pairs of countries (*ALLIANCE*). At the domestic level, previous research has shown that democratic pairs of countries tend to sign more preferential trade agreements than non-democratic or mixed pairs.[55] We use the seven point Freedom House scale of democracy to measure this variable, with 1 being the value for a completely free and 7 the value for a completely oppressive regime (*DEMOCRACY*).[56] The

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[53] Ibid., 45.
[54] Ruggie 1982.
[55] Mansfield *et al.* 2002.
[56] Freedom House 2007.

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advantage of the Freedom House index over others is that it covers all of the countries in our dataset and provides values for up to 2007.

Finally, we include two variables that measure the geographic distance between countries, as previous research has shown an effect of distance on the likelihood of signing a preferential agreement.[57] On the one hand, neighboring countries can be expected to have a higher probability of signing an agreement. Not only are there on average closer economic links between neighboring countries, but also the political links tend to be stronger. We thus expect countries that share a common border to be more likely to sign an agreement (*CONTIGUITY*). On the other hand, since trade costs increase with distance, geographically closer countries are more likely to form a preferential trade agreement. We thus include the (natural logarithm) distance in kilometers between the two capitals of the pair of countries in our base model (*DISTANCE*).

FINDINGS

In a first step, we estimate four different models (see Table 1). First, we report the findings of a Cox proportional hazards model, adjusted for clusters on dyads, with the restricted set of control variables. The findings are strongly supportive of our argument. The coefficient for the domino effect has the right sign and is statistically significant at the 0.01 level. Some of the variables capturing the alternative diffusion mechanisms are also statistically significant. Countries seem to be influenced in their decision to conclude agreements by the agreements concluded by other countries with the same language and colonial heritage. Religion is the only of these three variables capturing the emulation argument that is not statistically significant. Neither is the rivalry argument supported by the empirical

[57] Krugman 1992; Baier and Bergstrand 2004.

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examination. Countries do not seem to be reacting to the agreements concluded by countries that may pose a military threat.

TABLE 1 APPROXIMATELY HERE

Many of the control variables that have been shown to be important in previous research also turn out to be significant in this model, giving added plausibility to our findings. For one, a pair of countries with a strong trade link is more likely to form a trade agreement. Furthermore, pairs of countries with relatively large economies are more likely to sign an agreement. Security concerns seem to play a role as well, as countries that form part of the same alliance are more likely to form an agreement. Moreover, democratic pairs of countries are less prone to conclude an agreement, thus confirming previous research.[58] Also intuitive is the finding that distance reduces the likelihood of an agreement. Interestingly, however, contiguous countries are *less* likely to form an agreement than countries that do not share a common border.

Model 1 thus provides strong support for the argument that the signing of a preferential agreement among two countries has an effect on the probability of other countries signing a preferential trade agreement with them. We include figures to illustrate the magnitude of this effect (see Figures 3a, 3b, 4a, and 4b). Figure 3a shows the effect of a change in the importance of a market on the diffusion effect. As set out in the hypothesis above, the spatial effect of a trade agreement between two countries on a third country is much stronger if the excluded country has substantial export interests in at least one of these two countries. Figure 3b shows the same effect for the second variable that forms part of the

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[58] Mansfield *et al.* 2002.

trade and competition matrix. The more similar the exports of country B to those of country C, the greater the threat of trade diversion in country A, and thus the greater the incentive for country B to sign an agreement with country A. Figures 4a and 4b compare the substantive effects of the trade and competition matrix and the common colonial heritage matrix. As the graphs show, the effect is stronger for the competition variable.

FIGURES 3a, b and 4a, b APPROXIMATELY HERE

Models 2, 3, and 4 provide further support for our argument. In Model 2, we include additional control variables to check the robustness of our base model. The first of these is economic growth, as an economic downturn may increase the probability of a PTA being formed.[59] We use the average value for the two countries (*GDP GROWTH*). We also control for the export orientation of countries, that is, the importance that exports have as a percentage of the overall economy.[60] The more export oriented a country is, the larger the political influence of export interests should be. With exporters expected to benefit from a preferential trade agreement, an increase in exporters' power should increase the probability that this country signs a preferential agreement. Since members of the World Trade Organization (WTO) tend to have more similar trade policies than countries that do not form part of this international organization, dyads in which both countries are WTO members should be more likely to conclude an agreement (*WTO*).

Furthermore, we consider the possibility that during multilateral trade negotiations in the WTO countries' propensity to conclude preferential trade agreements increases (*WTO*

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[59] See for example Mattli 1999.
[60] As is common in the literature, we measure export orientation by the natural logarithm exports to GDP ratio in year *t-1*. See also Rodrik 1995.

ROUND). We also control for the argument reported above that involvement in trade disputes may influence a pair's propensity to conclude a trade agreement. Having a trade dispute with the other side should decrease the likelihood of an agreement (*TRADE DISPUTE*), while having a dispute with a third party should increase it (*TRADE DISPUTE THIRD PARTY*). As culturally similar countries may find it easier to negotiate an international agreement, we also include three proxies for cultural similarity, namely common language, same religion, and common colonial heritage (*LANGUAGE*, *RELIGION*, and *COLONY*). Finally, since being an island may influence a country's willingness to sign an agreement – namely increasing the willingness to overpass its geographical disadvantages – we also control for this variable in our extended models (*ISLAND*).

The results of the model including these control variables are very similar to those reported in Model 1. Among the new variables, most have the expected effect. For example, a strong export orientation makes countries eager to form preferential agreements. This finding provides support for our causal mechanism, which draws attention to the role of exporters in lobbying for preferential trade agreements. Two member countries of the WTO are more likely to conclude an agreement than if at least one country of a dyad is not a member of the WTO. A trade dispute between the two countries, however, makes them less likely to conclude an agreement. Interestingly, the previous finding by Walter Mattli that a lack of economic growth makes countries sign an agreement is not supported.[61]

In Models 3 and 4 we change the econometric approach, but without that changing the substantive findings. Noteworthy is the fact that in the model in which we use a rare events logistic regression (Model 4), the substantive effect of our key variable is even larger

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[61] Mattli 1999.

than in the other models. Overall, across all four models the support for our argument is thus very strong.

ROBUSTNESS CHECKS

To check the robustness of our results, we made a series of changes to our base model. For all of the changes discussed below, the results are roughly comparable to the ones presented and are available upon request. First, we estimated models in which we assume that preferential trade agreements have an impact on third countries for three and seven years after their signature. These changes control for the robustness of our initial hunch of a five-year effect. Second, with respect to the importance of the export market, we use the inverse of the geographical distance between A and B as a proxy for the amount of trade between the two countries. The advantage of using distance is that the quality of this data is very good (while data on dyadic trade flows is problematic). Moreover, distance has been shown to be a very important determinant of trade flows. This is a result of the fact that trade costs increase with geographic distance. By using distance we also avoid potential endogeneity problems arising with trade flows as discussed below.

Third, we disaggregate the spatial weights matrix set out above into its component parts. On the one hand, we estimate a model in which the spatial weight is purely determined by the difference in *per capita* GDP between the excluded country and the potential competitor. On the other hand, we assess a model with a spatial weights matrix calculated by solely considering the excluded country's exports to the discriminating country. The expectation for these two models is for the spatial effects to be statistically significant but of smaller magnitude than the ones reported above. This expectation is borne out by the analysis.

Finally, we estimated a series of models in which we dropped all dyads with (1) an EU country, (2) an EU or EFTA country, and (3) two Northern countries. The reason for excluding EU and EFTA countries is that both trading entities may be considered unitary actors in the international trading system. Our expectation was that relying on member states (as done above) rather than the aggregate trading entities should make us *under*estimate the competition effect in which we are interested. The following example illustrates this expectation: the agreement between the EU and Mexico (2000) is best seen as a response to the North American Free Trade Agreement.[62] The countries within the EU that pushed for this agreement were Spain, France and Germany. By coding this agreement for 15 EU member countries, including countries such as Ireland and Finland that had no interest in the agreement with Mexico, the competition effect is diluted. The EU creates further difficulties for our analysis: joining the EU means that the new member country has to sign up to all trade agreements that the EU forms part of at the time of accession. While a country such as Hungary may have joined the EU because of the logic set out in our argument, it was probably hardly interested in signing an agreement with Mexico. Nevertheless, in our analysis, there is no difference between accession and accepting agreements with third countries.

TABLE 2 APPROXIMATELY HERE

Table 2 shows the results of the models excluding EU and EFTA countries. In fact, as expected, the competition effect is stronger than in the base model. The fact that the values for all other variables are very similar to those reported above provides a strong

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[62] Dür 2007a.

indication that our results are very robust. The one variable that becomes statistically significant in Models 5 and 6 is rivalry. This is very intuitive, as military conflict has not played a role in Europe since World War II, but it does play a role in other continents. The most interesting finding, however, is that democracy no longer plays a role once the European countries are excluded from the dataset. This suggests that earlier findings of pairs of democracies being more likely to sign an agreement were driven by the European countries alone.[63] In Model 7, we dropped all the dyads between two developed economies to show the impact of policy diffusion on North-South and South-South preferential agreements that are a special feature of the current wave of regionalism. Again the results concur with the previous models.

CONCLUSION

This analysis has shown that the formation of preferential trade agreements is indeed an interdependent process. A country forms an agreement with another country if it competes on that market with third countries that already have preferential access. In making this point, we have contributed a quantitative test of an argument that is quite prominent in the literature on regionalism. Existing research offers several qualitative case studies of how excluded countries react to the creation of a preferential trade agreement. Nevertheless, quantitative research on this issue has so far been limited to a very small number of studies, which moreover are hampered by several shortcomings. We have been careful in designing a direct test of the argument and gathering more reliable data on the existence of preferential trade agreements than had been done before.

Our paper also contributes to the literature on spatial effects (policy diffusion), by calculating a trade-weighted matrix rather than one based solely on geographical distance,

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[63] Mansfield *et al.* 2002.

and by taking into account extra-dyadic relations. The time-varying nature of trade flows created major problems for earlier studies, which we overcome in this problem. To our knowledge, so far there has not been any attempt made at including extra-dyadic relationships in the definition of spatial lags, although doing so may be consistent with theory in many instances. For example, in the diffusion of bilateral investment treaties, the effect of one agreement on other countries' willingness to conclude an agreement may also depend on the relationship between the third country and the developing country that signed the initial agreement.

In future research, the present analysis could be extended in several respects. For one, it would be interesting to take into account excluded countries' possibility of forming a rival agreement, rather than signing an agreement with a member country of a preferential trade agreement. The classic case for such a rival agreement is the formation of the European Free Trade Agreement in response to the creation of the European Economic Community. Moreover, it would make sense to consider the fact that some dyads may deepen their agreements in response to other dyads concluding agreements, and that the deepening of agreements may lead other countries to seek an agreement as well. For example, the Single European Act (1987) arguably increased the interest among Mediterranean countries in signing a trade agreement with the EU. Finally, a good argument can be made that current preferential trade agreements not only threaten trade but also foreign direct investments. The North American Free Trade Agreement, for example, not only created problems for European companies exporting to Mexico, but also to European companies interested in investing in Mexico. A future study may take into account the contents of agreements and foreign investment flows in providing an even more comprehensive examination of the diffusion story.

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Table 1: Testing the Domino Argument

Covariates	Model 1	Model 2	Model 3	Model 4[64]
Estimation	Cox Model (clusters on dyads)	Cox Model (clusters on dyads)	Cox Model (Gamma Frailty)	ReLogit (clusters on dyads)
Domino theory				
TRADE & COMPETITION	0.24 **	0.24 **	0.23 **	0.36 **
	(0.09)	(0.09)	(0.10)	(0.12)
Alternative diffusion				
SPATIAL LANGUAGE	0.12 **	0.10 **	0.25 **	0.18 **
	(0.03)	(0.03)	(0.03)	(0.03)
SPATIAL COLONY	0.16 **	0.14 **	0.11 **	0.12 **
	(0.04)	(0.03)	(0.03)	(0.04)
SPATIAL RELIGION	-0.01	-0.05	-0.03	-0.06 *
	(0.03)	(0.03)	(0.03)	(0.02)
RIVALRY	0.07	0.12	0.13	0.19
	(0.07)	(0.07)	(0.08)	(0.11)
Control variables				
TRADE	0.08 **	0.07 **	0.08 **	0.12 **
	(0.03)	(0.03)	(0.03)	(0.04)
SIM	0.003	0.04	0.03	-0.03
	(0.13)	(0.02)	(0.03)	(0.03)
GDP	0.31 **	0.34 **	0.48 **	0.58 **
	(0.03)	(0.03)	(0.03)	(0.04)
GDP PER CAPITA	0.003	0.004	0.004	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
ALLIANCE	0.58 **	0.56 **	0.61 **	0.54 **
	(0.06)	(0.07)	(0.08)	(0.09)
DEMOCRACY	-0.12 **	-0.09 **	-0.12 **	-0.13 **
	(0.02)	(0.02)	(0.02)	(0.02)
CONTIGUITY	-0.73 **	-0.77 **	-0.23	-0.22
	(0.17)	(0.16)	(0.18)	(0.23)
DISTANCE	-1.16 **	-1.15 **	-2.24 **	-2.242 **
	(0.07)	(0.07)	(0.05)	(0.06)
GDP GROWTH		-0.01	-0.01 **	-0.01
		(0.004)	(0.004)	(0.01)
EXPORT ORIENTATION		0.10 **	0.10 **	0.03
		(0.03)	(0.04)	(0.04)
WTO		0.25 **	0.38 **	0.24 **
		(0.07)	(0.08)	(0.09)
WTO ROUND		0.68 **	0.78 **	0.82 **
		(0.10)	(0.10)	(0.09)
TRADE DISPUTE		-1.63 **	-1.60 **	-1.72 **
		(0.55)	(0.58)	(0.61)
TRADE DISPUTE THIRD PARTY		0.05	0.01	0.11
		(0.07)	(0.08)	(0.1)
LANGUAGE		-0.03	0.17	0.27 *
		(0.15)	(0.13)	(0.13)
RELIGION		0.27 **	0.33 **	0.58 **
		(0.08)	(0.09)	(0.10)
COLONY		0.28 *	0.20 *	0.25 *
		(0.16)	(0.11)	(0.12)
ISLAND		0.23 **	0.32 **	0.57 **
		(0.07)	(0.07)	(0.09)
Observations	225,833	225,833	225,833	225,833
Number of dyads signing a PTA	1,600	1,600	1,600	1,600
Log likelihood	-13,510.19	-13,460.39	-13,119.20	

*Notes:* standard errors are in parentheses. ** Significant at 1%, * significant at 5%.

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[64] The cubic natural spline functions are not reported. All spline functions are statistically significant at the 1 per cent level.

Table 2: Robustness Checks

Covariates	Model 5 (excluding the EU)	Model 6 (excluding the EU and EFTA)	Model 7 (excluding North-North dyads)
Estimation	Cox Model (clusters on dyads)	Cox Model (clusters on dyads)	Cox Model (clusters on dyads)
Domino effect			
TRADE & COMPETITION	0.31 **	0.28 **	0.24 **
	(0.08)	(0.08)	(0.09)
Alternative diffusion			
LANGUAGE	0.20 **	0.20 **	0.13 **
	(0.03)	(0.03)	(0.03)
COLONY	0.17 **	0.21 **	0.17 **
	(0.05)	(0.05)	(0.04)
RELIGION	-0.02	-0.003	-0.004
	(0.03)	(0.03)	(0.03)
RIVALRY	0.18 *	0.22 **	0.09
	(0.08)	(0.08)	(0.07)
Dyadic controls			
TRADE	0.08 **	0.07 *	0.08 **
	(0.03)	(0.03)	(0.02)
SIM	0.01	0.03	0.01
	(0.02)	(0.02)	(0.02)
GDP	0.30 **	0.28 **	0.34 **
	(0.03)	(0.03)	(0.02)
GDP PER CAPITA	0.03 **	0.03	0.03 **
	(0.01)	(0.01)	(0.01)
ALLIANCE	0.74 **	0.80 **	0.61 **
	(0.08)	(0.09)	(0.07)
DEMOCRACY	-0.02	-0.04	-0.11 **
	(0.02)	(0.02)	(0.02)
CONTIGUITY	-0.40 *	-0.29	-0.72 **
	(0.16)	(0.17)	(0.17)
DISTANCE	-0.97 **	-1.02 **	-1.15 **
	(0.08)	(0.09)	(0.07)
Observations	185,234	176,492	221,561
Number of dyads signing a PTA	1,159	1,053	1,535
Log likelihood	-9,509.64	-8,539.71	-13,460.39

Notes: standard errors are in parentheses. **Significant at 1%, *significant at 5%.

Figure 1: The proliferation of preferential trade agreements, 1990-2007
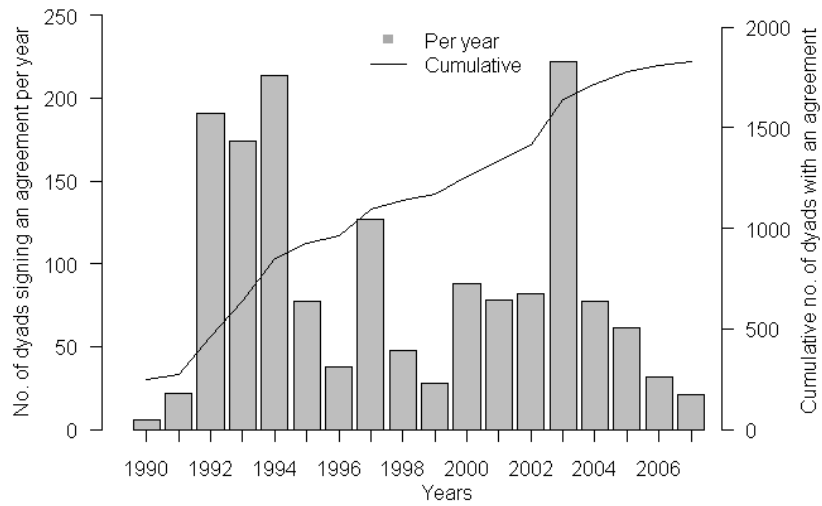
Figures 2a and b: The spatial weights

Bolivia-Chile: Spatial Interdependence

Bulgaria-Czech Rep.: Spatial Interdependence
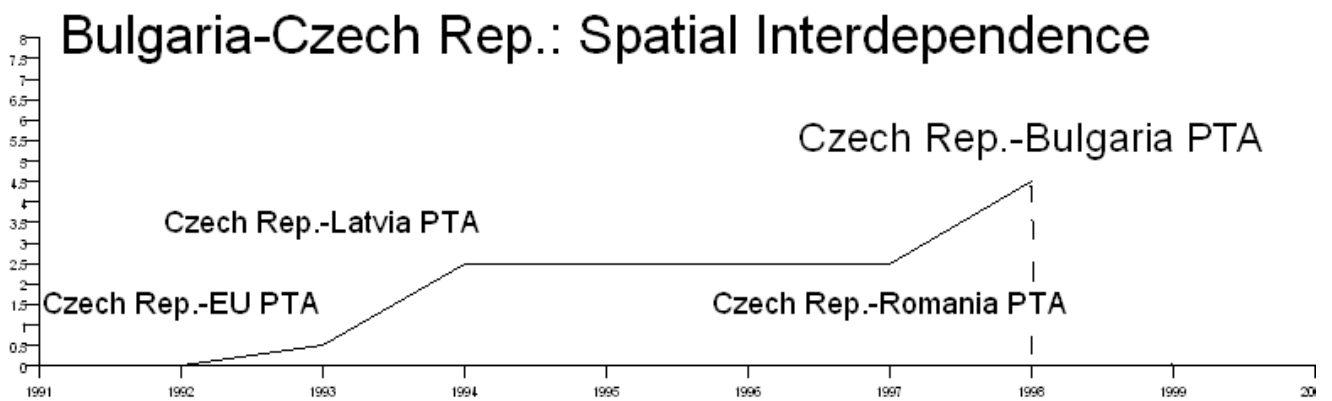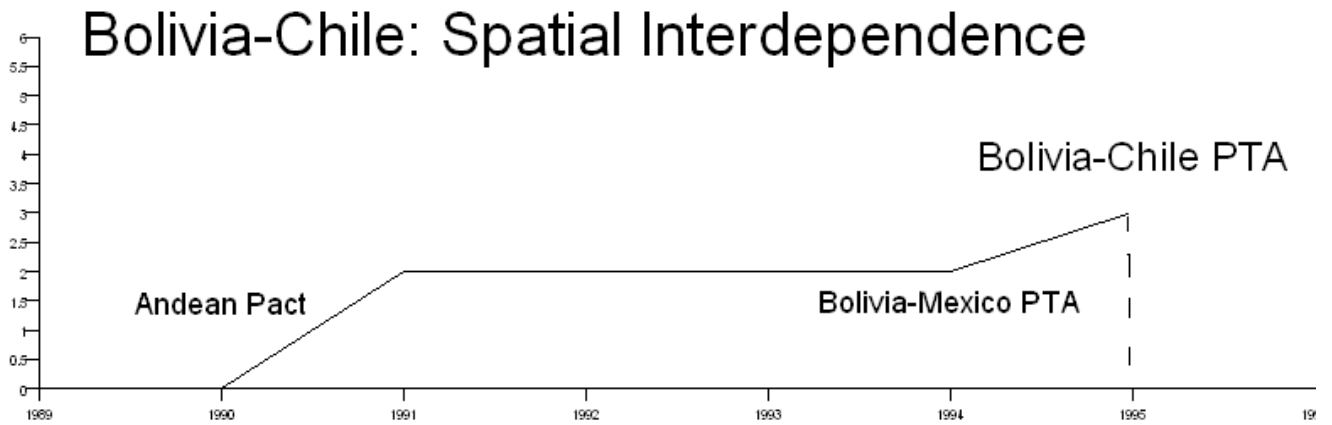
Figures 3a, b. Cox model clusters on dyads: survival estimates for Trade and competition, comparing important versus irrelevant trade partner and close versus not close competitors.
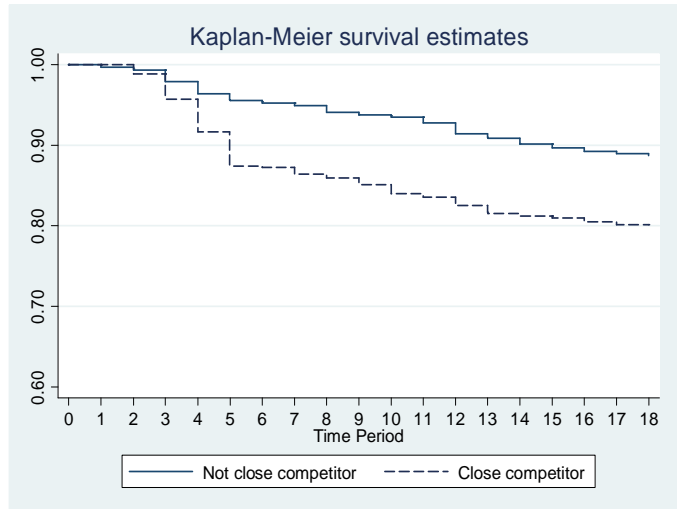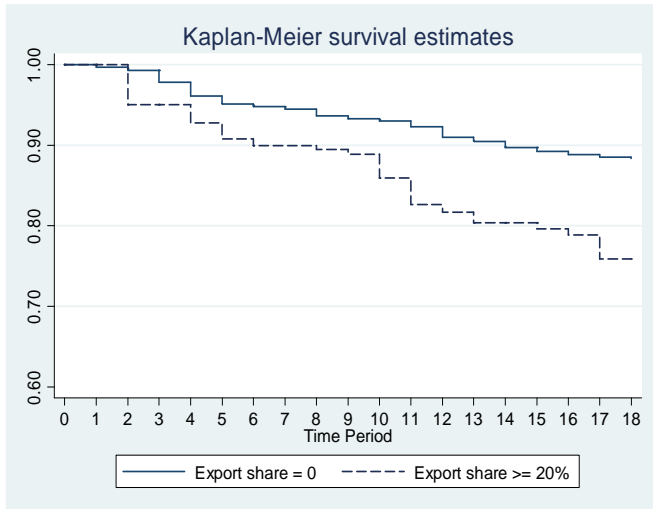
Figures 4a, b. Cox model clusters on dyads: survival estimates for trade & competition and common colonial past.

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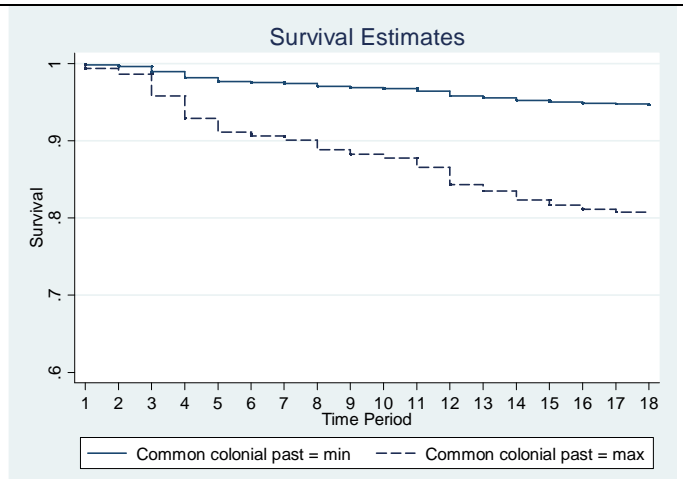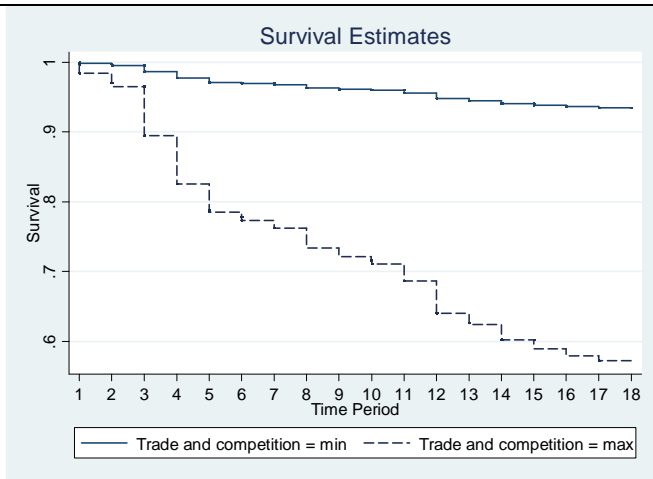
Data Appendix

	Variables	Mean	Std. deviation	Minimum	Maximum	Data sources
Dependent variable	Average survival rate	0.01	0.08	0	1	
Domino effect	DISTANCE AND COMPETITION	0.63	0.90	0	7.99	(1)
	TRADE AND COMPETITION	0.03	0.20	0	6.74	(1)
Competing Arguments	SPATIAL LANGUAGE	0.91	1.32	0	9.36	(2)
	SPATIAL RELIGION	1.58	1.51	0	9.91	(3)
	SPATIAL COLONY	1.68	1.57	0	9.36	(2)
	RIVALRY	0.16	0.41	0	4	(4)
Controls	SIM	3.70	2.07	0	9.49	(1)
	GDP	1.77	1.25	0.10	8.57	(1)
	RLF	9.14	11.46	0	89.82	(1)
	GDP PER CAPITA	1.71	3.46	0	62.91	(1)
	GDP GROWTH	0.33	6.63	-52.6	35.2	(1)
	TRADE	8.84	1.32	3.37	13.68	(1)
	TRADE DEPENDENCE	0.0003	0.04	0	0.59	(1)
	EXPORT ORIENTATION	5.99	1.50	1.55	12.93	(1)
	ALLIANCE	0.13	0.34	0	1	(4)
	DEMOCRACY	4.73	2.01	1	7	(5)
	DISTANCE	8.69	0.75	2.35	9.90	(2)
	CONTIGUITY	0.02	0.14	0	1	(2)
	WTO	0.51	0.50	0	1	(6)
	TRADE DISPUTE	0.005	0.07	0	1	(7)
	DISPUTE WITH THIRD PARTY	0.28	0.45	0	1	(6)
	WTO ROUND	0.65	0.48	0	1	(8)
	LANGUAGE	0.08	0.27	0	1	(3)
	RELIGION	0.15	0.37	0	1	(2)
	COLONY	0.15	0.36	0	1	(2)
	ISLAND	0.28	0.45	0	1	(2)

Sources: (1) IMF; (2) CEPII (2005) (3) Encyclopedia Britannica Book of the Year 2001; (4) Correlates of War dataset; (5) Freedom House (2007); (6) World Trade Organization (2008); (7) Horn and Mavroidis (2006); (8) Compiled by the authors.