Preferential Trade Agreements: Recent Theoretical and Empirical Developments[*]

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Abstract

In recent decades, there has been a dramatic proliferation of Preferential Trade Agreements (PTAs) between countries which, while legal, contradict the non-discriminatory principle of the world trade system. This chapter describes approaches taken in the literature to study the economic consequences of PTAs, the economic and political determinants of PTAs, the design of welfare-improving PTAs and the dynamic implications of PTAs for the evolution of the world trade system.

Keywords: Preferential Trade Agreement, exclusion incentive, free riding incentive, stumbling bloc, building bloc, trade diversion, trade creation, tariff preferences, tariff complementarity.

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1 Introduction

A cornerstone of the World Trade Organization (WTO), is the principle of non-discrimination: member countries may not discriminate against goods entering their borders based upon the country of origin. However, in an important exception to its own central prescript, the WTO, through Article XXIV of its General Agreement on Tariffs and Trade (GATT), does permit countries to enter into preferential trade agreements (PTAs) with one another. Specifically, under Article XXIV, countries may enter into PTAs by liberalizing "substantially" all trade between them "in a reasonable period of time" and not raising trade barriers on outsiders. They are thereby sanctioned to form Free Trade Areas (FTAs), whose members simply eliminate barriers to internal trade while maintaining independent external trade policies, or Customs Unions (CUs), whose members additionally agree on a common external tariff against imports from non-members.[1,2]

Such PTAs have been in vogue for the last few decades. Indeed, the rise in preferential trade agreements between countries stands as the dominant trend in the recent evolution of the international trade system, with hundreds of GATT/WTO-sanctioned agreements having been negotiated during this period and with nearly every member country of the WTO belonging to at least one PTA.[3]

Alongside this evolution of the world trade system towards preferential trade, there has been great interest in the academic literature on the economics and politics of trade preferences. Any discussion of preferential trade liberalization should begin with a basic

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[1] Additional departures to the principle of non-discrimination include the Enabling Clause, which allows tariff preferences to be granted to developing countries and permits preferential trade agreements (which are not subject to the disciplines imposed by Article XXIV) among developing countries in goods trade. See Ornelas (2016) for a survery of the literature on special preferences available for developing countries.

[2] In modeling both positive and normative aspects of PTAs, the theoretical literature has often been guided by an abstraction of these GATT Article XXIV rules that PTAs require immediate elimination of internal trade barriers and not raising external trade barriers. See Lake and Roy (2017) and Saggi et al. (2019) for papers considering hypothetical PTAs that do not eliminate internal tariffs. And, see Mrázová et al. (2012) for an example where PTA members can raise their external tariff on non-members.

[3] Among the more prominent PTAs currently in existence are the North American Free Trade Agreement (NAFTA) and the European Economic Community (EEC), the MERCOSUR (the CU between the Argentine Republic, Brazil, Paraguay, and Uruguay) and the ASEAN (Association of South East Asian Nations) Free Trade Area (AFTA).

consideration of when and why trade liberalization undertaken on a preferential basis in favor of particular trading partners may not have the same welfare consequences as non-discriminatory trade liberalization in favor of all imports? In other words, when should PTAs not be equated with free trade? This question was taken up in the classic analysis of Viner (1950), which elegantly developed an analytical framework whose insights remain crucial in the theoretical and empirical analysis of trade agreements. Viner's point was that preferential trade liberalization by a "home" country in favor of a "partner" may result in two types of possible outcomes. On the one hand, lower trade barriers stimulate trade flows and could thereby generate "trade creation". On the other hand, the preferential access enjoyed by the partner stimulates supply from the partner country even if partner country firms are less efficient than suppliers from the rest of the world and could thereby generate welfare-decreasing "trade diversion."

Taking the Vinerian distinction between "trade creation" and "trade diversion" and the resulting ambiguity in welfare outcomes with preferential trade, the economics literature has proceeded in several different directions, which are surveyed here. Considerable energy was devoted to studying the design of necessarily-welfare-improving PTAs, as discussed in Section 2, while taking care to distinguish between the analysis of FTAs and CUs. Section 3 discusses the arguments made in the theoretical literature on the question of the impact of PTAs on the multilateral system. Section 4 discusses empirical issues. Section 5 concludes.

2   Necessarily Welfare Improving Preferential Trade Areas

The generally ambiguous welfare results provided by Viner provoked an important question relating to the design of necessarily-welfare-improving PTAs. A classic result stated independently by Kemp (1964) and Vanek (1965) and proved subsequently by Ohyama (1972) and Kemp and Wan (1976) provides a welfare-improving solution for the case of CUs. Starting

from a situation with an arbitrary structure of trade barriers, if two or more countries freeze their net external trade vector with the rest of the world through a set of common external tariffs and eliminate the barriers to internal trade (implying the formation of a CU), the welfare of the union as a whole necessarily improves (weakly) and that of the rest of the world does not fall. A Pareto-improving PTA may thus be achieved.

The logic behind the Kemp-Wan theorem is as follows: by fixing the combined, net extra-union trade vector of member countries at its pre-union level, non-member countries are guaranteed their original level of welfare. Moreover, taking the extra-union trade vector as an endowment, the joint welfare of the union is maximized by allowing free trade of goods internally (thus equating the marginal rate of substitution and marginal rate of transformation for each pair of commodities to each other and across all agents in the union). The PTA thus constructed has a common internal price vector, implying further a common external tariff for member countries. This CU is (weakly) welfare improving; the rest of the world is no worse off and the welfare of member countries is jointly improved (weakly). Welfare improvement is achieved even if additional "non-economic" objectives (such as maintaining the output of a sector or its employment of a factor) are introduced as Krishna and Bhagwati (1997) shows. The Kemp-Wan-Ohyama design, by freezing the external trade vector and thus eliminating trade diversion, offers a way to sidestep the complexities and ambiguities inherent in the analysis of PTAs. It has played an important role in shaping the way that economists think about issues relating to the design and implementation of PTAs.

The Kemp-Wan-Ohyama analysis of welfare improving CUs does not extend easily to FTAs, however. In the case of an FTA, member-specific tariff vectors imply that the domestic-price vectors differ across member countries and the FTA generally fails to equalize marginal rates of substitution across its members. Without a common internal price vector, however, the Kemp-Wan-Ohyama methodology lacks application. Nevertheless, Panagariya and Krishna (2002) provided a corresponding construction of necessarily welfare-improving FTAs. The Panagariya-Krishna FTA, in complete analogy with the Kemp-Wan CU, freezes

the external trade vector of the area, with the essential difference that the trade vector of each member country with the rest of the world is frozen at the pre-FTA level. Since, in FTAs, different member countries impose different external tariffs, it is necessary to specify a set of rules-of-origin to prevent a subversion of FTA tariffs by importing through the lower-tariff member country and directly trans-shipping goods to the higher-tariff country (which, if allowed, would bring the FTA arbitrarily close to a CU). The Panagariya-Krishna solution requires that all goods for which any value is added within the FTA are to be traded freely. Importantly, the proportion of domestic value added in final goods does not enter as a criterion in the rules-of-origin.

Theory thus suggests that ensuring welfare improvement requires the elimination of internal barriers and that external tariff vectors eliminate trade diversion so that member countries import the same amounts from the rest of the world as they did initially. Successive expansion of such trade blocs could lead to monotonic welfare improvements until global free trade is reached.[4] It should be noted that this theoretical prescription holds in simple economies, without explicit consideration of the global input-output linkages through what are popularly referred to as "global value chains." The extension of the Kamp-Wan-Ohyama design for CUs and the Panagariya-Krishna design for FTAs to allow for the presence global value chains, whose structure would itself be endogenous to trade policy is an interesting issue for future research.

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[4]The Kemp-Wan and Panagariya-Krishna templates offer a specific path, with particular external tariff choices, through which PTAs could successively expand to reach global free trade while monotonically improving welfare. In an interesting contribution, Krugman (1991) studied welfare implications along an exogenous path of economic integration in which the countries coalesced into n symmetric integrated economic units, while imposing non-cooperative tariffs on non-members. On the one extreme, n was equal to the total number of countries in the word (no trade blocs) while on the other extreme $n = 1$. With optimal tariffs being imposed by member countries on non members, Krugman found that global welfare was non-monotonic in n, reaching its nadir when $n = 3$ - an ominous conclusion at that time – as the world appeared, in the 1990s, to be evolving into 3 separate blocs - one in the Americas, a second in Europe and a third in Asia.

3 Preferential Trade Agreements and the Multilateral Trade System

What are the implications of preferential tariffs for the multilateral trade system? One may begin by asking how the existence of preferential tariffs affects the efficiency of the multilateral trade system. In an influential contribution, Bagwell and Staiger (1999a) argued that the basic principles of GATT have an underlying economic logic. First, the principle of reciprocity ensures that reciprocal tariff concessions only impact a country's trade-weighted terms-of-trade through the bilateral trade weights rather than the bilateral terms-of-trade. Second, non-discrimination via the MFN principle ensures that a country's tariff does not affect its bilateral trade weights. Thus, together they deliver economically efficient outcomes. Put differently, the MFN principle ensures (trade-weighted) terms-of-trade externalities flow through world prices and the principle of reciprocity neutralizes terms-of-trade externalities traveling through world prices. Nevertheless, this insight of Bagwell and Staiger (1999a) also highlights a basic tension between PTAs and a multilateral system based on the principles of reciprocity and non-discrimination: by violating the MFN principle, PTAs undermine the presumption that the multilateral system based on reciprocity will deliver efficient outcomes.[5]

Second, one may ask, whether the successive expansion of PTAs can achieve global free trade by eventually including all trading nations? Or, will economic and political factors inhibit such a path? This has been a long standing question in the literature because of the contrasting nature of liberalization embodied in PTAs versus the various rounds of global trade liberalization (stretching back to the Geneva Round in 1947, to the Uruguay Round in 1994 and the Doha Round). While global trade liberalization through these various rounds was done on a non-discriminatory basis following the MFN principle, PTAs are inherently

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[5]Bagwell and Staiger also contributed to the literature on how PTAs impact the multilateral trade system through the lens of a repeated game framework that looked at how a single PTA impacted the ability of countries to sustain multilateral cooperative tariffs (e.g. Bagwell and Staiger (1997b) and Bagwell and Staiger (1997a)). However, unlike our subsequent focus, this strand of the literature does not look at how the successive expansion of PTAs impacts outcomes of the multilateral trade system.

discriminatory because PTA members eliminate trade barriers between themselves but do not eliminate trade barriers on non-members. Starting with the analyses of Levy (1997) and Krishna (1998), several attempts have been made in the economic literature to understand the phenomenon of preferential trade and its interaction with the multilateral trade system while taking into account the domestic determinants (political and economic) of trade policy.[6]

On the surface, whether PTAs inhibit the degree of global trade liberalization seems like a very complex issue given the various economic and political forces at play. However, at their core, concerns over whether PTAs inhibiting global trade liberalization typically rely on one of two incentives faced by PTA members. Early analyses emphasizing how PTAs could have an adverse effect (e.g. Levy (1997), Krishna (1998)) featured PTA formation where members wanted to exclude non-members. This "exclusion incentive" of PTA members restrained the extent of global liberalization. Later papers (e.g. Ornelas (2005), Saggi and Yildiz (2010)) recognized that PTA non-members themselves may not want to participate in subsequent PTAs, especially if, despite the discriminatory nature of PTAs, non-members derive some kind of benefits when other countries form a PTA. From this view, PTA non-members may hold a "PTA free riding incentive" that restrains the extent of global trade liberalization. These two incentives frame the first layer of our discussion in the following sections.[7]

The second layer of our discussion revolves around how "static" versus "dynamic" considerations shape the impact of PTAs. Intuitively, a static analysis ignores the dimension of time. A common modeling setup in the literature assumes a three country world and asks the following question: do a pair of countries want to form a PTA and, if so, how does this impact the possibility of reaching global free trade relative to the status quo without the PTA? In other static approaches, all countries essentially meet in Geneva on a given day and

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[6] In an earlier contribution, Grossman and Helpman (1995) analyzed the political-economy determinants of PTAs. They reached the worrisome conclusion, also reached by Krishna (1998), that trade diverting agreements were more likely to find domestic political support. However, unlike the focus of our subsequent discussion, they did not consider the implications of PTAs for the multilateral trade system.

[7] In terms of international externalities, the exclusion and free riding incentives in the literature typically depend on terms of trade and/or profit shifting externalities. If governments are not merely motivated by national welfare, the exclusion incentive also reflects a government's desire to redistribute surplus to politically powerful groups through its own tariff.

either decide an all PTAs that will form or negotiate over MFN liberalization. Conversely, approaches with dynamic considerations emphasize the importance played by the sequencing of events and the dimension of time. In the literature, the former can play a meaningful and substantive role for the notion of a "stable" outcome. The latter brings out tensions between the costs and benefits associated with paths of PTAs formed over time; for example, the immediate benefit of PTA formation versus the future cost of other countries responding by forming their own PTAs. Ultimately, static and dynamic considerations shed light on different issues associated with the role of PTAs.

Within these two layers of the exclusion incentive versus the free riding incentive and static considerations versus dynamic considerations, further issues will determine whether PTAs help or hinder the extent of global trade liberalization. One issue is the precise way that global negotiations are modeled. A simple approach asks whether any country vetoes a move to global free trade (e.g. Krishna (1998), Ornelas (2005)). A more sophisticated approach endogenizes which countries engage in, and the degree of, multilateral MFN liberalization (e.g. Saggi and Yildiz (2010), Saggi et al. (2013), Ornelas (2008)). This latter approach gives rise to the possibility that a country may refuse participation in multilateral negotiations to free ride on the MFN liberalization of others. A second issue concerns country asymmetries. In many models, a tension between different forces drives the underlying analysis. In this case, country asymmetries, either in terms of demand-side characteristics or supply-side characteristics, can tip the balance between these forces in one way or the other.

3.1 PTA exclusion incentive

Intuitively, the exclusion incentive creates an a priori expectation that PTAs will adversely impact the extent of global trade liberalization. That is, by forming PTAs, countries gain preferential market access through reciprocal elimination of bilateral tariff barriers and this reduces their incentive to participate in global MFN negotiations which they would happily do in the absence of their PTA. Indeed, this broad logic plays out in a variety of settings.

3.1.1 Static considerations

PTAs as stumbling blocs Levy (1997) and Krishna (1998) considered the question of PTAs in somewhat "static" political economy settings. Here, FTA formation delivers substantial gains to politically powerful groups and these politically powerful groups then oppose multilateral liberalization, defined as a move to global free trade, that they would not have opposed in the absence of the FTA. Given the assumption that these politically powerful groups hold sway over their government's trade policy decisions, each FTA member holds an exclusion incentive and FTAs act as a stumbling bloc.

While the exclusion incentive is more general than the settings in Levy (1997) and Krishna (1998), the particular economic settings in these papers microfound the nature of the exclusion incentive. In Levy (1997), FTA formation in a Heckscher-Ohlin model can deliver disproportionate gains to the median voter who is the politically powerful group. The median voter then fails to support multilateral liberalization even though they would support multilateral liberalization in the absence of the FTA. Krishna (1998) uses an oligopolistic model of imperfect competition where domestic producers are the politically powerful group. Here, FTA-induced trade diversion creates rents for these producers under the FTA that would be eliminated by multilateral liberalization. While these two models rely on politically powerful groups to generate an exclusion incentive, exclusion incentives can also arise when FTA member governments are purely motivated by national welfare.[8]

The general importance of the exclusion incentive can be seen from Aghion et al. (2007). They analyze a model that does not specify a particular model of trade nor a particular government objective function. Rather, they leave government payoffs from different configurations of FTAs as generic objects. Because their setting specifies a "leader" country who makes take-it-or-leave-it offers to two follower countries and these offers include international transfers, one can think of the exclusion incentive as the joint payoff for FTA members exceeding their joint payoff under multilateral liberalization. When the leader country dictates

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[8]See Lemma 1 of Lake (2017) for numerous such examples in an FTA context.

multilateral liberalization, global free trade emerges if the three-country joint payoff under global free trade exceeds their joint payoff in the absence of any agreements. This is a rather unrestrictive condition in models with governments motivated by national welfare. Moreover, a single FTA involving the leader emerges when FTA members hold an exclusion incentive. Thus, in a reasonably large class of settings, FTAs are stumbling blocs in the presence of an exclusion incentive.

The exclusion incentive is also more general the FTA setting. Indeed, the exclusion incentive is generally stronger in CU settings. For a reasonably large class of trade models and government preferences, FTA formation actually induces FTA members to lower their tariffs on non-members. This phenomena is known as tariff complementarity.[9] Importantly, by practicing tariff complementarity, each FTA member imposes a negative externality on its FTA partner by reducing the degree of preferential market access given to its FTA partner. Because CU members coordinate their common external tariffs, CU members can internalize the negative intra-PTA externality of tariff complementarity. As such, CU members generally have a stronger exclusion incentive than FTA members. Indeed, Saggi et al. (2013) show the stumbling bloc nature of FTAs extends to CUs in the presence of exclusion incentives.[10]

While the flavor of the analysis in Saggi et al. (2013) bears close resemblance to the literature discussed above, Saggi et al. (2013) take a rather different approach to modeling multilateral liberalization. Here, "multilateral" liberalization via the MFN principle can take place between two countries rather than the entire world of three countries. Indeed, two-country MFN liberalization creates the natural possibility that the third country may want to free ride on the MFN liberalization of the other two countries.[11] Thus, whether CUs are building blocs or stumbling blocs depends on the relative strength of the CU exclusion

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[9]We discuss empirical evidence regarding tariff complementarity in Section 4.4. Theoretically, important contributions here include Richardson (1993) and Bagwell and Staiger (1999b).

[10]The microfoundations of the exclusion incentive in their model rest on governments purley motivated by national welfare in a perfectly competitive "competing exporters" model where a given good is exported by two countries that compete when exporting to a third country.

[11]In general, it also creates the possibility that two countries may want to exclude the third country from MFN liberalization.

incentive and the MFN free riding incentive. For an intermediate degree of asymmetry with two "attractive" countries and one "unattractive" country, Saggi et al. (2013) find that the CU exclusion incentive exists but the MFN free riding incentive does not exist. That is, CUs are stumbling blocs in this case because MFN liberalization leads to global free trade but CU expansion does not.[12]

The notion of a county's "attractiveness" as a PTA partner will prove useful throughout our discussion of the theoretical literature. To this end, we hereafter say that a potential PTA partner country A is more attractive than another potential PTA partner country B if PTA formation with A yields a higher one-period payoff than PTA formation with country A. The economic characteristics defining attractiveness in the literature are typically supply side (e.g. a measure governing the strength of comparative advantage) or demand side characteristics (e.g. market size). As such, the literature has typically assumed that all countries have the same view about the ranking of country attractiveness. In Saggi et al. (2013), for example, each country has endowments of two comparative advantage goods and zero endowment of its single comparative disadvantage good. Here, countries with smaller endowments, i.e. smaller export volumes, are more attractive partners because giving tariff free access to such countries comes with a smaller terms of trade loss.[13]

PTAs as building blocs   In the analyses of Levy (1997) and Krishna (1998), PTAs can never be building blocs. One key reason is that they abstract from an MFN free riding incentive when modeling multilateral liberalization. That is, the presence of the MFN free riding incentive in Saggi et al. (2013) creates the possibility that CUs could act as building blocs.

Indeed, Saggi et al. (2013) show how the structure of asymmetry can change from one that

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[12]When the degree of asymmetry is small, neither incentive exists and global free trade emerges under both CU formation and multilateral liberalization. When the degree of asymmetry is large, both incentives exist and global free trade does not emerge under either CU formation or multilateral liberalization.

[13]The idea that countries with smaller export volumes, regardless of the particular microfoundations, make more attractive PTA partners is typical in the literature and not specific to the microfoundations in Saggi et al. (2013). Also typical in the literature are demand side assymetries (e.g. market size) that make a country a larger importer and, in turn, a more attractive partner.

generates a CU exclusion incentive but no MFN free riding incentive to one that generates an MFN free riding incentive but no CU exclusion incentive. As described above, the former happens with two attractive countries and one unattractive country. But, moving to a structure with one attractive country and two unattractive countries strengthens the MFN free riding incentive of the attractive country and also weakens the CU exclusion incentive of the attractive country. Now, for an intermediate degree of asymmetry, the MFN free riding incentive exists but the CU exclusion incentive does not exist. Hence, CUs become building blocs.

Although not a building bloc result in the sense typically viewed in the literature, Ornelas (2008) also shows how a type of exclusion incentive can promote global trade liberalization that would otherwise not take place. In his model, governments negotiate MFN tariff liberalization on a multilateral level both before and after formation of a single FTA. Because governments have political economy motivations, governments do not reach global free trade as the outcome of MFN liberalization. The crucial observation of Ornelas (2008) is a "multilateral" tariff complementarity effect whereby PTA formation increases the degree of MFN liberalization that governments negotiate at the multilateral level.[14] Nevertheless, the PTA is politically viable only if PTA members benefit relative to the outcome of MFN liberalization at the multilateral level in the absence of the PTA. Thus, in a world where governments always set MFN tariffs cooperatively at the multilateral level, this type of exclusion incentive promotes global trade liberalization.

3.1.2 Dynamic considerations

PTAs as stumbling blocs Thinking about the time dimension brings additional insight to the implications of an exclusion incentive. An immediate insight is that the FTA may induce economic agents to undertake decisions that impact resource allocation. For example,

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[14]This extends the traditional notion of tariff complementarity whereby PTA formation lowers the optimal external tariffs of PTA members (see, e.g., Richardson (1993) and Bagwell and Staiger (1999b)) to a multilateral setting where PTA formation lowers the optimal multilateral cooperative tariff.

firms may increase investment in the export sector so that they are better positioned to take advantage of the preferential market access resulting from the FTA. In turn, the associated change in the production structure of FTA members can increase the benefit of the FTA for FTA members relative to the benefit of multilateral liberalization. If these investments represent sunk costs, and hence the associated resources cannot be reallocated elsewhere, the benefit of FTA formation relative to multilateral liberalization itself changes because of the FTA. As such, the FTA-induced reallocation of resources can itself create an exclusion incentive and represents a dynamic microfoundation for the exclusion incentive that goes beyond the static microfoundations described in Section 3.1.1.

McLaren (2002) formalizes this idea based around *anticipation* of an FTA. Anticipating the FTA, economic agents incur sunk costs in the form of sector-specific investments. Because economic agents would make different investments if they were not anticipating an FTA, the investments in anticipation of the FTA increase the benefit of the FTA relative to multilateral liberalization. Indeed, McLaren (2002) shows countries may be unwilling to engage in multilateral liberalization after the FTA-induced resource reallocation even though they would have happily engaged in multilateral liberalization rather than FTA formation before such resource reallocation. That is, the FTA-induced resource reallocation creates an exclusion incentive that makes FTAs stumbling blocs.

The static treatments of FTA formation discussed above ignore the reality that the process of FTA formation plays out relatively slowly over time. Indeed, the global network of PTAs is still far short of global free trade despite 25 years having passed since the proliferation of PTAs began around the time of the 1994 Uruguay Round. Odell (2006) documents NAFTA negotiations beginning in the mid 1980s despite not being implemented until 1994. Mölders (2012, 2015) and Freund and McDaniel (2016) document that three to four years typically passes between PTA negotiations and PTA implementation. This evolution of the global PTA network over time creates dynamic trade offs for countries regarding PTA formation.

An intuitive dynamic trade off emerges for FTA members in the context of an FTA

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exclusion incentive. Naturally, an FTA member can form its own subsequent FTA with the FTA non-member. In the typical three-country model of the literature, an initial FTA member becomes the "hub" through such an FTA and has sole preferential market access to the other two "spoke" countries that include its initial FTA partner and the FTA outsider. Since this sole preferential market access is valuable for the hub, initial FTA members value the flexibility of FTA formation that allows becoming the hub. This flexibility benefit of FTAs is a "short-run" or "myopic" benefit of subsequent FTA formation for FTA members. Nevertheless, because the spoke countries will generally form their own FTA and precipitate global free trade, the exclusion incentive represents a farsighted cost for FTA members of subsequent FTA formation. Thus, FTA members face a trade off. On one hand, additional FTA formation is myopically valuable because of the sole preferential market access enjoyed as the hub. But, on the other hand, this benefit is only temporary because such FTA formation eventually leads to global free trade and the exclusion incentive says this leaves the initial FTA members worse off.

Naturally, whether the myopic nature of the FTA flexibility benefit dominates the farsighted nature of the exclusion incentive depends on whether countries are relatively patient or relatively myopic. While one may not think of the discount factor governing the degree of country patience as an economic fundamental of inherent interest, economic fundamentals drive the relative size of the flexibility benefit and exclusion incentive. Thus, economic fundamentals, and changes in these fundamentals, drive the threshold discount factor, and changes in this threshold discount factor, that balance the FTA flexibility benefit and the FTA exclusion incentive.

Lake (2017) shows how economic fundamentals affect the role of PTAs where the key dynamic trade off balances the myopic nature of the FTA flexibility benefit and the farsighted nature of the FTA exclusion incentive.[15] FTAs are stumbling blocs with two sufficiently

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[15]Rather than use a particular trade model, Lake (2017) considers a class of trade models that includes settings of perfect competition or imperfect competition as well as country asymmetries including demand size asymmetries or supply side asymmetries. Ultimately, the particulars of any given trade model determine the characteristics that make countries attractive partners or unattractive partners.

attractive countries and one sufficiently unattractive country. In this situation, the FTA exclusion incentive is very strong because the attractive countries place a large valuation on protecting their preferential market access. Moreover, the FTA flexibility benefit is rather weak because the attractive countries place little value on the additional preferential market access with the FTA outsider. In turn, FTA formation yields a single FTA. However, no country would veto a move to global free trade in the absence of FTAs because the world market is relatively attractive given the two sufficiently attractive countries. Thus, FTAs are stumbling blocs.

In addition to economic fundamentals, global negotiations themselves can impact the magnitude of the FTA exclusion incentive and the FTA flexibility benefit. Traditionally, very few papers in the literature consider the role played by the upper bounds on tariffs, i.e. tariff bindings, that countries negotiate during global negotiation rounds.[16] However, these tariff bindings can affect FTA formation incentives by restricting countries' ability to levy tariffs. In particular, when tariff bindings restrain the ability of the FTA non-member to impose tariffs on FTA members, these FTA members have already extracted tariff concessions from the non-member. By decreasing the value of eliminating the tariffs imposed by the FTA non-member, global free trade becomes less appealing for FTA members and becoming the hub also becomes less appealing. In turn, the FTA exclusion incentive strengthens and the FTA flexibility benefit weakens. Indeed, Lake et al. (2018) show how the existence of the FTA exclusion incentive depends on sufficiently strict tariff bindings. They also show that progressively stricter tariff bindings reduce the extent that FTA formation expands to global free trade. This suggests that globally negotiated reductions in tariff bindings can increase the extent that FTAs act as stumbling blocs.

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[16]Ethier (1998) and Freund (2000) both suggest PTA formation is a benign consequence stemming from the success of global trade negotiations. Indeed, Freund shows how lower global tariffs can make FTA formation attractive when it was otherwise unattractive. On the other hand, Lake and Roy (2017) show how the tariff bindings that emerge from global negotiations actually create an FTA exclusion incentive that does not exist in the absence of global negotiations. In turn, global negotiations are actually a stumbling bloc to global free trade.

PTAs as building blocs   Given the dynamic trade off between the FTA flexibility benefit and the FTA exclusion incentive depends on economic fundamentals, one may wonder whether FTAs can be building blocs under certain economic fundamentals. Indeed, Lake (2017) shows FTAs are building blocs with two sufficiently unattractive countries and one sufficiently attractive country. In this situation, the FTA exclusion incentive is rather weak because FTA members place little value on the preferential market access they protect as FTA members. In turn, the FTA flexibility benefit propels FTA expansion to global free trade because of the sole, albeit temporary, preferential access enjoyed by the hub in each spoke market. However, the sufficiently attractive country vetoes a move to global free trade in the absence of FTAs because the world market is relatively unattractive given the two sufficiently unattractive countries. Thus, FTAs are building blocs.

While not an explicitly dynamic analysis, the insights of Missios et al. (2016) shed light on the role played by the FTA exclusion incentive using considerations that have a dynamic flavor. Technically, their three-country setting is a static setting where countries simultaneously announce the FTAs they want to form and mutually agreed upon FTAs form immediately. But, the inherent coalitional aspect of FTA formation renders the Nash equilibrium solution concept rather inappropriate. Thus, Missios et al. (2016) use the well known game theoretic solution concept of Coalition Proof Nash Equilibrium (CPNE) which is a subset of the Nash equilibria. Dynamic considerations enter CPNE in the sense that the presence of a two-country jointly profitable coalitional deviation by countries only rules out a configuration of FTAs as an equilibrium outcome if the coalitional deviation is immune to any *subsequent* unilateral deviations by the members of the *initial* deviating coalition.

Unlike the explicit dynamic analysis of Lake (2017) and Lake et al. (2018), the FTA exclusion incentive never prevents FTA expansion from reaching global free trade for Missios et al. (2016).[17] Starting from global free trade, the FTA exclusion incentive says it is

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[17] Given Missios et al. (2016) also show that countries would always form CUs if given the choice between CUs and FTAs, the question arises as to why FTAs far outnumber CUs in reality. This is an interesting and relatively underdeveloped strand of the literature. See Lake (2019) for a review of the literature and an explanation based on a dynamic trade off between the FTA flexibility benefit and coordination benefits of

profitable for two countries to jointly deviate and sever their FTAs with the third country so that the two countries are the "new" FTA members of the sole FTA. However, ruling out global free trade as an equilibrium outcome also requires that neither of the "new" FTA members have a unilateral incentive to subsequently deviate. The key observation now is that the FTA non-member has already announced its willingness to form individual FTAs with each of the "new" FTA members; otherwise, global free trade would not have been the initial outcome. Thus, the FTA flexibility benefit says each of these "new" FTA members has an incentive to deviate and announce it will form an additional FTA with the FTA non-member. Hence, despite the FTA exclusion incentive, global free trade remains a CPNE outcome.

Intuitively, the CPNE logic says each country understands that jointly deviating from global free trade to exclude the third country leaves open the possibility for its "new" FTA partner to exploit the FTA flexibility benefit and become the hub. Ultimately, the FTA flexibility benefit ensures the FTA exclusion incentive goes unexercised in equilibrium. Moreover, although not part of the analysis by Missios et al. (2016), this insight implies that FTAs would be building blocs in the presence of an MFN free riding incentive that prevents MFN liberalization reaching global free trade in the absence of FTAs.

3.1.3 Summary

Ultimately, the baseline presumption one should have in mind in the presence of a PTA exclusion incentive is that PTAs will be stumbling blocs. Importantly, this presumption is independent of the economic and political microfoundations underlying the exclusion incentive and, as already outlined, there are a wide variety microfoundations for the exclusion incentive.

In terms of whether this presumption can be overturned, our above discussion highlights two key modeling features. First, given the exclusion incentive is a static concept, are there

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CU formation. Lake and Yildiz (2016) build on this framework to explain why CUs are always intra-regional while FTAs are both intra- and inter-regional.

dynamic considerations that propel PTA formation to global free trade despite the exclusion incentive? Missios et al. (2016) and Lake (2017) show how such dynamic considerations may play out. Second, can countries negotiate the *degree* of multilateral tariff liberalization as opposed to a binary choice over global free trade? Ornelas (2008) shows the importance of this when governments negotiate jointly optimal multilateral MFN tariffs before and after PTA formation. And, Missios et al. (2016) show its importance when each country can choose whether to participate in multilateral liberalization. In this sense, assumptions about the nature of multilateral liberalization and the existence of dynamic considerations over PTA formation drive whether PTAs are building blocs or stumbling blocs in the presence of an exclusion incentive.

3.2 PTA Free-Riding incentive

Although exclusion incentives have long been of concern for impact of PTAs on multilateral liberalization, concerns over free riding incentives have developed more recently. Intuitively, the free riding incentive also creates an a priori expectation that PTAs will adversely impact the extent of global trade liberalization. That is, by refusing to engage in subsequent PTA formation, PTA non-members constrain the extent that PTAs can help facilitate global free trade.

3.2.1 Static considerations

PTAs as stumbling blocs   The possibility of a free riding incentive with MFN liberalization is perhaps obvious. Because MFN tariff concessions apply to all trading partners, a country still benefits from the MFN tariff concessions made by other countries even if they do not give reciprocal tariff concessions. However, despite the discrimination faced, a PTA non-member may also benefit from the PTA formation of other countries and thus refuse subsequent PTA formation.

The standard way in the literature that this can happen is through the phenomenon of

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tariff complementarity. That is, PTA non-members derive a benefit from PTA formation by other countries when such PTA formation induces PTA members to lower their MFN tariffs on the non-member. In many trade models, the benefit to the non-member from tariff complementarity can dominate the discrimination embodied in the PTA. As such, a PTA non-member may refuse subsequent PTA formation even though they would have happily participated in subsequent PTA formation in the absence of tariff complementarity.

Ornelas (2005) shows tariff complementarity can be deep enough that the FTA actually benefits the non-member. Moreover, the associated free riding incentive can be strong enough that the FTA non-member prefers remaining an FTA outsider over a direct move to global free trade. Thus, the "success" of an FTA in lowering MFN tariffs can undermine the support for global free trade by creating an FTA free riding incentive. As such, FTAs become stumbling blocs in the sense that the FTA outsider refuses participation in global free trade precisely because of FTA formation by the FTA members.

Section 3.1 discussed how CUs can be building blocs or stumbling blocs based around a tension between the CU exclusion incentive and an MFN free riding incentive. That setting explicitly modeled the choice of countries to participate in MFN liberalization and the degree of MFN liberalization among those engaged in MFN liberalization. Stoyanov and Yildiz (2015) take a similar approach in a setting featuring both an FTA free riding incentive and an MFN free riding incentive. The FTA free riding incentive emerges from the tariff complementarity phenomenon, and can be strong enough that the FTA outsider refuses participation in global free trade. Ultimately, whether FTAs are building blocs or stumbling blocs depends on whether the FTA free riding incentive dominates the MFN free riding incentive.

Stoyanov and Yildiz (2015) use a political economy framework where governments have "political preferences" in that they place extra weight on the profits of their oligopolistic firms relative to national welfare. They show the FTA free riding incentive dominates the MFN free riding incentive when political preferences are not too asymmetric between countries.

If political preferences are rather weak in this case, neither an FTA nor MFN free riding incentive exists. But, when political preferences are moderately strong in this case, the FTA free riding incentive exists but the MFN free riding incentive does not exist. Thus, FTAs are stumbling blocs because of the FTA free riding incentive.

PTAs as building blocs Once one recognizes the trade off between the FTA and MFN free riding incentives, the possibility of FTAs as building blocs emerges despite the FTA free riding incentive placing some restraint on FTA expansion to global free trade. Stoyanov and Yildiz (2015) and Saggi and Yildiz (2010) demonstrate this possibility.

The economic environments in Stoyanov and Yildiz (2015) and Saggi and Yildiz (2010) are quite different. As descried above, Stoyanov and Yildiz (2015) use an oligopolistic model where governments have political preferences. In contrast, Saggi and Yildiz (2010) use a model of perfect competition where supply side differences across countries give rise to comparative advantage and governments only care about national welfare. Yet, in both settings, the MFN free riding incentive can dominate the FTA free riding incentive. In particular, when political preferences are sufficiently asymmetric across countries in Stoyanov and Yildiz (2015) and when countries are moderately asymmetric in terms of their supply side characteristics in Saggi and Yildiz (2010), the MFN free riding incentive exists but the FTA free riding incentive does not exist. Thus, in these cases, FTAs are building blocs.

3.2.2 Dynamic considerations

PTAs as stumbling blocs As discussed above, Ornelas (2005) showed how the FTA free riding incentive can be large enough for the FTA non-member that it refuses FTA expansion to global free trade even though it would have participated in global free trade in the absence of the FTA. In this sense, FTAs were stumbling blocs because of the FTA free riding incentive. Nevertheless, an interesting situation of strategic interaction emerges upon taking a dynamic perspective.

In a dynamic setting, whether FTA formation takes place depends on whether the potential FTA members can commit to not form their FTA. That is, FTA members have an incentive to induce the potential non-member's participation in global free trade by not forming the initial FTA. Indeed, FTA members have no obligation to form an FTA and they could delay formation of a possible FTA to induce the non-member's participation in global free trade. Of course, the potential non-member also has an incentive to threaten non-participation in global free trade as a means to induce an FTA between the potential members. Ornelas (2005) models this tension using a dynamic "war of attrition" game. Here, the status quo of no agreement prevails in each period until either the FTA members form their FTA or all countries agree to global free trade. In equilibrium, the probability of the potential members forming an FTA, and the non-member then free riding on the FTA, increases in the degree of the FTA free riding incentive. That is, given global free trade emerges if countries could not form FTAs, the probability of FTAs acting as stumbling blocs increases with the degree of the FTA free riding incentive.

Just as an intuitive dynamic trade off emerges for FTA members in the context of an FTA exclusion incentive, an intuitive dynamic trade off emerges for the FTA non-member in the context of an FTA free riding incentive. The free riding incentive says FTA formation actually benefits the non-member to the extent that, from a myopic perspective, the FTA outsider has an incentive to refuse subsequent FTA formation. Moreover, if the FTA free riding incentive is strong enough then not even the removal of discrimination in both FTA member markets can make global free attractive for an FTA non-member. However, in many settings, the FTA free riding incentive will not be this strong and an FTA outsider would happily move directly to global free trade. In this case, FTA expansion to global free trade represents a farsighted benefit of engaging in subsequent FTA formation for the FTA outsider. Naturally, whether the myopic nature of the FTA free riding incentive dominates the farsighted benefit of reaching global free trade depends on whether countries are relatively patient or relatively myopic.

Lake et al. (2018) show how global negotiations themselves can impact the relative magnitude of the FTA free riding incentive and the benefit of FTA formation expanding to global free trade. In particular, by increasing the FTA non-member's ability to impose tariffs on FTA members, more lax tariff bindings strengthen the FTA free riding incentive of the FTA outsider and decrease the attractiveness of global free trade. Thus, more lax tariff bindings decrease the extent that FTA formation expands to global free trade. This suggests that lax tariff bindings could be important for understanding the incentive of FTA non-members to free ride on FTA formation and the associated possibility of FTAs as stumbling blocs.

PTAs as building blocs   Along similar lines to lax tariff bindings being important for the possibility of FTAs as stumbling blocs, deep enough tariff binding concessions could lead to FTAs being building blocs despite the FTA free riding incentive. In particular, by restraining the FTA non-member's ability to impose tariffs on FTA members, stricter tariff bindings weaken the FTA free riding incentive of the FTA outsider and increase the attractiveness of global free trade. Following this logic, Lake et al. (2018) show that stricter tariff bindings increase the extent that FTA formation expands to global free trade in the presence of an FTA free riding incentive. Moreover, continual reductions in the tariff binding eventually eliminate the FTA free riding incentive. Thus, continual reductions in the tariff binding can facilitate FTA expansion to global free trade and, in the presence of an MFN free riding incentive, suggests that tariff binding concessions can make FTAs into building blocs.

3.2.3   Summary

In summarizing the key takeaways in the presence of an FTA free riding incentive, our key takeaways largely parallel those in the presence of an exclusion incentive. Again, ultimately, the baseline presumption one should have in mind in the presence of an FTA free riding incentive exclusion incentive is that FTAs will be stumbling blocs. And, as should be clear by now, this presumption is independent of the economic and political microfoundations

underlying the FTA free riding incentive. Like the exclusion incentive, a wide variety of economic and political situations can microfound the FTA free riding incentive.

In terms of whether this presumption can be overturned, our above discussion highlights the same two key modeling features that were important in overturning the presumption of the exclusion incentive leading to PTAs as stumbling blocs. First, given the FTA free riding incentive is a static concept, are there dynamic considerations that propel PTA formation to global free trade despite the FTA free riding incentive? Lake et al. (2018) show how such dynamic considerations may play out. Second, can countries negotiate the *degree* of multilateral tariff liberalization so that multilateral liberalization need not produce global free trade? Saggi and Yildiz (2010) and Stoyanov and Yildiz (2015) show the importance of this when each country can choose whether to participate in multilateral liberalization. Thus, again, assumptions about the nature of multilateral liberalization and the existence of dynamic considerations over FTA formation drive whether FTAs are building blocs or stumbling blocs in the presence of an FTA free riding incentive.

3.3 Limitations and open issues

The literature has highlighted the importance of the PTA exclusion incentive and the FTA free riding incentive for understanding the role played by PTAs. Nevertheless, the overarching limitation of the literature is that it has not generated sharp and empirically testable implications regarding PTA formation. For example, this literature has not provided key insights to the empirical determinants of PTA literature pioneered by Baier and Bergstrand (2004).[18] Further, relatively few papers in the literature devote serious attention to explaining how the mechanisms at play could help shed light on casual observations regarding real

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[18]In the closely related theoretical literature that tries to address the real world prevalence of FTAs relative to CUs, Facchini et al. (2012) build a model based around "strategic delegation". In follow-up work, Facchini et al. (2017) extend their earlier work by developing and empirically testing theoretical relationships that link trade imbalances and income inequality with the choice of FTAs versus CUs.

Another example of a theoretical paper of PTA formation that generates testable empirical implications is Saggi et al. (2018). They develop a theoretical model of PTA formation where PTA formation induces non-members to adjust their tariffs. This generates sharp and testable empirical predictions for tariffs of PTA non-members that are verified by their empirical analysis.

world patterns of PTA formation.

One reason for the lack of empirically testable predictions or insights on casual observations regarding PTA formation is the inherently stylized nature of the models. Specifically, even though the natural presumption is that the PTA exclusion incentive and FTA free riding incentive should constrain the extent of PTA formation and give rise to a stumbling bloc role of PTAs, this is not necessarily the case. As emphasized above, the particular way that multilateral liberalization is modeled and the presence of dynamic considerations that involve the PTA exclusion incentive or FTA free riding incentives are the key issues that shape whether this presumption can be overturned. In turn, this complicates the search for sharp and robust empirical predictions.

Also contributing to the stylized nature of the models used in the literature is that they are generally three country models. Part of the reason is that three country models were enough to make the key initial observations regarding the impacts of the exclusion incentive and the free riding incentive. Nevertheless, part of the reason is also technical. In explicitly dynamic models with the dimension of time, the number of possible paths of PTAs grows exponentially. In static models whose solution concept has a dynamic flavor, such as CPNE, the consideration of four rather than three countries dramatically increases the set of possible coalitional deviations and the path of subsequent deviations that one must consider for any given coalitional deviation. Despite these complications, Wong (2017) extends the three-country CPNE analysis of Saggi and Yildiz (2010) to four countries. In doing so, she shows that the MFN free riding incentive strengthens dramatically and thus, in stark contrast to Saggi and Yildiz (2010), FTAs are stumbling blocs in the presence of an FTA free riding incentive. This observation again emphasizes the difficulty in finding robust and empirically testable predictions.

An alternative approach to considering a marginal increase in the number of countries is to move away from game theoretic settings with their particular structure and particular equilibrium concepts and use network theory concepts. Indeed, Goyal and Joshi (2006) and

Furusawa and Konishi (2007) represent classic papers in the PTA literature that use the network theory concept of "pairwise stability" to characterize the outcome of PTA formation in an n-country world. The "domino theory" of regionalism hypothesized by Baldwin (1995) also has a strong network theoretic flavor. Moreover, the insights gained from a network theoretic view of PTA formation have influenced the empirical literature following Baier and Bergstrand (2004), with prominent examples including Egger and Larch (2008), Chen and Joshi (2010) and Baldwin and Jaimovich (2012). Thus, network theory and its stability concepts provide a possible path forward to investigate the more general role of PTA exclusion incentives and FTA free riding incentives. Empirically, non-traditional approaches including structural econometric models of network formation (e.g. Mele (2017)) or numerical simulation methods (e.g. Daisaka and Furusawa (2014)) could help with testing empirical predictions from such settings.

We see the use of quantitative trade models as a very important step forward for the PTA literature. Quantitative trade models can help the literature move beyond stylized theoretical trade models. They can also help bridge the gap between theory and data. As such, they are very well suited to addressing the key limitations described above. Using his multi-country multi-sector quantitative trade model, Ossa (2014) obtains optimal tariffs and conducts counterfactuals related to tariffs and welfare in a trade war and under efficient multilateral negotiations.[19] Similarly, Bagwell et al. (2018) conduct counterfactuals that ask how the 1994 Uruguay Round of multilateral negotiations would have been different in terms of tariffs and welfare if these negotiations were not subject to the MFN principle.

In the PTA literature, the only paper we know of to investigate how PTAs impact multilateral liberalization in a quantitative trade model is Kwon (2018). He looks at the impact of NAFTA on the outcome Uruguay Round. In line with a building bloc role of FTAs, he finds Uruguay Round tariff concessions would have been about 25% smaller and world welfare nearly 1% lower in the absence of NAFTA. Indeed, the key theoretical mechanism driving

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[19]See Ossa (2016) for a survey of the quantitative trade model literature.

this result is the multilateral tariff complementarity result of Ornelas (2005). In turn, the analysis of Kwon (2018) emphasizes a key takeaway from our discussion above that how one models multilateral liberalization is a key assumption in terms of whether PTAs are building blocs or stumbling blocs.

Moving forward, we see four main further opportunities for major developments in understanding, both theoretically and empirically, the role played by the impact of PTAs within the global trade system. Rules of Origin (RoO) represent the first such avenue. The 2017-2018 NAFTA renegotiations, in particular the stance of the US regarding auto imports, highlight the importance that countries place on RoO. Theoretically, Tsirekidze (2016) shows how RoO impact the FTA free riding incentive. Empirically, Conconi et al. (2018) document the trade diversion caused by RoO and construct an incredibly valuable dataset that not only includes NAFTA product-level RoO but also the extent that a final good relies on intermediate inputs subject to RoO. This represents a major development in terms of codified RoO data that can potentially help bridge the gap between theoretical models of PTA formation and implementing empirical tests of such models.

A second avenue that can hopefully allow testable empirical predictions regarding the role of PTAs is the consideration of global value chains (GVCs). Indeed, casual observation suggests that GVCs could be extremely important in shaping country incentives for PTA formation. In terms of the literature discussed above, GVCs could map into the existence of exclusion and free riding incentives. Alternatively, consideration of GVCs could give rise to a new class of incentives crucial to the role of PTAs. Recent work, including Bown et al. (2016), has begun investigating the implications of GVCs for optimal tariffs in PTA settings, but the impact of GVCs for PTA formation remains an exciting avenue for future research.

A third avenue for future research concerns the advent of "mega-regional" trade agreements. Essentially, the term "mega-regional" indicates the substantial scope of the PTA in terms of global trade coverage and specific areas of negotiation. Examples include well known agreements such as the now implemented version of the Trans-Pacific Partnership

(TPP) without the US as well as yet to be negotiated Trans-Atlantic Trade and Investment Partnership (TTIP). Less well-known examples include the Regional Comprehensive Economic Partnership (RCEP) between the ASEAN countries and other countries including India, China, Japan and Korea. While many issues in the existing literature will still apply to such mega-regional agreements given they are ultimately PTAs, new issues will undoubtedly arise. For example, anecdotal evidence suggests one motivation for mega-regional agreements is to ensure the standards of member countries (e.g. auto industry standards) take hold as the de-facto global standard. This issue does not fit in the box of issues addressed by the requirements of Article XXIV that govern PTA formation or Article I which establishes the MFN principle.

A fourth avenue for research revolves around the possibility that countries could exit from PTAs. Until recently, PTAs have mostly been modeled as binding agreements. However, the United Kingdom's possible exit from the European Union (popularly referred to as Brexit) that is currently under discussion and US' re-negotiation of NAFTA, under the threat of exit, should renew theoretical interest in the economic environments involving the dissolution of, or the threat of exiting from, PTAs. In the context of the UK, those in favor of Brexit have frequently argued that leaving the EU CU would provide the UK with the flexibility to form its own FTAs that it does not have as a CU member. This flexibility "benefit" is at the heart of a country's endogenous choice between FTAs and CUs in Lake and Yildiz (2016), Lake (2019) and Lake et al. (2018). For NAFTA renegotiations, the strand of the PTA literature that has focused self-enforcing agreements in the context of repeated games could provide an important starting point (e.g. Bagwell and Staiger (1997a) and Bagwell and Staiger (1997b)). These approaches would likely take the PTA literature into the broader game theoretic literature dealing with repeated games on networks described recently by Jackson and Zenou (2015).

4 Empirical Analysis

4.1 How Much Trade Has Been Liberalized Through PTAs?

A major argument made by the proponents of regionalism concerns the slow pace of the multilateral process in achieving trade liberalization. With this as background, one may ask how much trade has actually been liberalized by preferential trade agreements and whether countries have managed to liberalize, through bilateral agreements, trade that they have been otherwise been unable to liberalize multilaterally.

The analysis provided by the recent 2011 WTO World Trade Report (WTR; WTO (2011)) is instructive in this regard. The WTR reports that there has been a significant increase in the value of trade taking place between PTA members. In 1990, trade between PTA partners made up around 18 percent of world trade and this figure rose to 35 percent by 2008 (in both cases, the figures indicated exclude intra-EU trade). When the European Union is included, intra-PTA trade rose from about 28 percent in 1990 to a little over 50 percent of world trade. In nominal dollar terms, the value of intra-PTA trade, excluding the EU countries, rose from 537 billion USD in 1990 to 4 trillion USD by 2008 and from 966 billion to nearly 8 trillion once the EU is included. This suggests that by now a large share of world trade is taking place between PTA members. However, as the WTR points out, these statistics vastly overstate the extent of preferential trade liberalization and thus the extent of preferential trade that is taking place. This is so because much of the trade between PTA members is in goods on which they impose MFN tariffs of zero in the first place. And goods which are subject to high MFN tariffs are also often subject to exemptions from liberalization under PTAs, so that the volume of trade that benefits from preferences is, on average, quite low.

Specifically, WTR calculations indicate that despite the recent explosion in PTAs, only about 16 percent of world trade takes place on a preferential basis (the figure rises to 30 percent when intra-EU trade is included in the calculations). Furthermore, less than 2

percent of trade (4 percent when the EU is included) takes place in goods which receive a tariff preference that is greater than 10 percent. For instance, well over 50 percent of Korean imports enter with zero MFN tariffs applied to them. Korea offers preferences to about 10 percent of its imports, but a preference margin greater than 10 percent on virtually none of its imports. Similarly, in India, goods entering under preference are about five percent of overall imports with over 50 percent of imports coming in under zero MFN tariffs and virtually no imports receiving a preference of greater than 10 percent. A similar picture emerges on the exporting side. One of the countries that has actively negotiated PTAs is Chile and 95 percent of Chilean exports go to countries that it has a PTA with. However, only 27 percent of Chilean exports are eligible for preferential treatment and only 3 percent of its exports benefit from preference margins greater than 10 percent.

Taken together, the preceding statistics suggest that the extent of trade liberalization undertaken through PTAs has been quite modest, despite the large number of PTAs that have in fact been negotiated. These observations challenge the claim by proponents of regionalism that preferential agreements are a faster or more efficient way of achieving trade liberalization. At some level this should not perhaps be too surprising. It is widely understood that a major factor working against trade liberalization is the political opposition of the import competing lobbies. If this is the case, it is unclear why lobbies that oppose trade liberalization at the multilateral level would easily support liberalization undertaken on a preferential basis. One should therefore expect that political lobbies would mostly only permit preferential agreements in which their rents were protected, either through access to partner country markets, or, more simply, through an exemption of liberalization on imports of those goods that compete with their own production, suggesting complementarities between MFN and PTA tariffs.

To explore the question of whether MFN tariffs and PTA tariffs are indeed complements, Baldwin and Seghezza (2010) examined correlations between MFN and PTA tariffs at the 10 digit level of disaggregation for 23 of the top exporting countries within the WTO (for

which data was available). Consistent with the preceding discussion, they find that MFN tariffs and PTA tariffs are complements, since the margin of preferences tends to be low or zero for products where nations apply high tariffs. This finding of complementarity has been confirmed in the more detailed studies by Joshi (2010, 2011) for NAFTA and the EU. All of these studies suggest that third factors, such as vested sectoral interests, drive trade policy at both the multilateral and the bilateral level. The implication is that one should not expect liberalization that is difficult at the multilateral level, to necessarily proceed easily at the bilateral level.

4.2   Trade Creation vs Trade Diversion

A variety of recent contributions in the economics literature have examined the trade creating and trade diverting effects of preferential agreements. Romalis (2007) investigates the effects of NAFTA and the previously formed Canada-US Free Trade Agreement (CUSFTA) on trade flows. He finds that NAFTA and CUSFTA had a substantial impact on international trade volumes, but a modest effect on prices and welfare. While he finds that NAFTA and CUSFTA increased North American output in many highly protected sectors, imports from non-member countries were driven out, suggesting trade diversionary effects.

Other papers have analyzed the trade and welfare effects of CUSFTA or NAFTA. Caliendo and Parro (2015) analyze the effects of NAFTA, building on the Eaton and Kortum (2002) multi-good multi-country model of Ricardian trade by allowing for intermediate inputs in production. They find quite modest welfare effects (less than 0.1 percent welfare gains for the US and Canada and 1 percent for Mexico) but substantial trade creation effects for bilateral trade flows involving Mexico and very little trade diversion effects. Clausing (2001) and Trefler (2004) use cross sectional variation in the extent of trade liberalization and attempt to estimate the relative magnitudes of trade creation and trade diversion caused by CUSFTA. Both analyses find that trade creation dominated trade diversion and Trefler (2004) reports a positive welfare outcome for Canada overall.

A number of studies have used "gravity" specifications to examine the impact of preferential trade agreements on trade. Two prominent recent examples include Magee (2008) and Baier and Bergstrand (2007). Using panel data from over a hundred countries for nearly two decades (1980-1998), Magee (2008) estimates trade creation and trade diversion effects of preferential trade agreements and finds this trade and welfare impact to be small, although trade creation dominates trade diversion in his analysis. Using a similar sample of countries, but going back further in time (1960-2000), Baier and Bergstrand (2007) estimate trade creation effects by considering explicitly the endogeneity of preferential trade agreements (but excluding by assumption any trade diversion effects). Baier and Bergstrand find the endogeneity of trade agreements to be crucial, and report that accounting for this endogeneity raises by about five times the estimate of the increase in trade flows between member countries. Specifically, trade between member countries is predicted to double in ten years after the formation of the FTA.

The preceding discussion covers only a small sample of the research quantifying trade creation and trade diversion effects with trade preferences. Nevertheless, it should suffice to illustrate the wide range of estimates that have been obtained. On the one hand, the findings in many papers suggest that changes in trade flows due to trade preferences will be small. On the other, hand, some papers have suggested the possibility of significant trade diversion, while others have estimated large trade creation effects. The evidence is clearly mixed.

One study that is additionally noteworthy, because of its detailed and unusual focus on changes in industry trade flows as related to patterns of comparative advantage is Yeats (1998) which investigated trade diversion within PTAs by performing an evaluation of trade patterns within MERCOSUR. Specifically, to study the impact of MERCOSUR on trade patterns, Yeats (1998) characterized goods using two measures. The first measure is a "regional orientation" index (for good i) which is the ratio of the share of that good in exports to the region to its share in exports to third countries. The second measure is the

"revealed comparative advantage" (of good i) which is the ratio of the share of good in MERCOSUR's exports to third countries to its share in world exports (exclusive of intra-MERCOSUR trade). Specifically, Yeats (1998) then compares the change in a good's regional orientation index between 1988 and 1994 (before and after MERCOSUR) with their revealed comparative advantage ranking. The results of his study are striking. As he notes, the goods with the largest increase in regional orientation are goods with very low revealed comparative advantage rankings. Specifically, for the 30 groups of goods with the largest increases in regional orientation, only two had revealed comparative advantage indices above unity. That is, the largest increases in intra-MERCOSUR trade have been in goods in which MERCOSUR countries lack comparative advantage suggesting strong trade diversionary effects. This is a striking finding and provides a cautionary note against the dismissals of trade diversion as a merely theoretical concern.

The possibility that certain types of country pairings in a PTA may create more trade than they may divert led the literature to examine country-pair characteristics that would yield this beneficent outcome. Wonnacott and Lutz (1989), Krugman (1991), and Summers (1991)) variously emphasized geographic proximity as a criterion for membership in a PTA, arguing that regional trading partners could be described as ?natural trading partners? in the context of preferential trade. However, the analysis of Krishna (2003) does not find supporting evidence for the natural trading partners hypothesis in US data. In an econometric investigation of US trade, aimed at estimating trade creation and trade diversion effects under (hypothetical) trade preferences towards a variety of countries, trade creation and trade diversion are found to be correlated in their magnitudes and net welfare gains (i.e., gains from trade creation net of trade diversion losses) are found to be wholly uncorrelated with distance. Krishna (2003) concludes that arguments for regionalism in trade preferences do not appear to be supported by the data, at least for the United States.

4.3 External Terms of Trade

Thus far, we have focused our discussion largely on trade flow and welfare consequences of preferential trade liberalization on the countries undertaking the liberalization. While not explicitly considered so far, it should be easy to see that changes in demand by PTA members for the rest of the world's exports could lower the relative price of these exports (i.e., worsen the rest of the world's terms of trade). In general, the overall effect on the external terms of trade may be seen as a combination of income and substitution effects. The former represents the effect of real income changes due to the PTA on demand for imports from non-members and the latter reflects the substitution in trade towards partner countries (and away from non-member) due to the preferences in trade. In the case of a real-income reducing PTA, both effects would combine to lower demand from the rest of the world. This is also the case when substitution effects dominate the income effect.

Some indication of how the terms of trade may change for non-member countries in practice is provided by the empirical analysis of Chang and Winters (2002) who examine the impact of MERCOSUR (specifically, the exemption in tariffs that Brazil provided to its MERCOSUR partners) on the terms-of-trade (export prices) of countries excluded from the agreement. Theory would suggest that trade diversion would worsen the terms of trade of excluded countries and this indeed is what they find. They report significant declines in the export prices of Brazil's major trading partners (the United States, Japan, Germany and Korea) following MERCOSUR. These associated welfare losses sustained by the excluded countries are significant, amounting to roughly ten percent of the value of their exports to Brazil.

Using panel data gravity methods motivated by a structural gravity model, Anderson and Yotov (2016) investigate how FTAs formed in the 1990s impact the terms of trade of members and non-members among a set of 40 countries and a rest of the world region. Taking all FTAs of the 1990s as a whole, Anderson and Yotov (2016) indeed find that countries who did not enter FTAs during the 1990s – Australia, China, Korea, Japan and the rest of the

world region – suffered terms of trade losses. However, these losses were negligible with terms of trade declines less than 0.3%.

4.4   Tariff Preferences and Multilateral Liberalization – Empirical Evidence

The interplay between trade preferences and multilateral liberalization has been studied in a number of papers in the literature. Estevadeordal et al. (2008) has studied the effect of preferential tariffs on external trade liberalization in a group of ten Latin American countries by asking whether the MFN tariff by a country on imports of any given good (defined at the ISIC 4 Digit-level) are related to the corresponding preferential tariff applied by the country in the preceding period. They find no evidence that trade preferences in FTAs within Latin America led to higher external tariffs or smaller tariff cuts, but find instead that preferences induce a faster decline in external tariffs.[20] In CUs within Latin America, however, preferential liberalization is not associated with any change in external tariffs.

Differently, Limão (2006) considered the question of whether liberalization undertaken by the US in the Uruguay round was related to preferential liberalization prior to the Uruguay round. More specifically, he examines MFN tariff cuts in the Uruguay round for a cross section of products (at HS 8 level of disaggregation) and asks if these cuts were lower on products with a regional preference in place or if the opposite was true. In contrast with Estevadeordal et al. (2008), his findings support the argument that trade preferences may indeed impede multilateral progress; MFN tariff cuts were smaller in products that were subject to trade preferences. Karacaovali and Limão (2008) have repeated this exercise for the EU and found similar results.

Tovar (2012) used data disaggregated at the HS 6 level to examine the same question in

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[20]Using the dataset from Estevadeordal et al. (2008), Crivelli (2016) presents evidence consistent with a mechanism whereby high-tariff countries reduce external tariffs to offset tariff revenue losses from PTA formation. In particular, she shows the results are driven by goods where the share of preferential imports rise and by high-tariff importing countries who rely on tariff revenue as an important source of government revenue.

the context of the formation of the FTA signed between Costa Rica the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and the United States in 2004 (CAFTA-DR). Focusing on the four Central American countries for which the agreement has been in force since 2006 – El Salvador, Guatemala, Honduras and Nicaragua – she found that MFN tariffs were raised (or lowered by less) in products with larger reductions in preferential tariffs.

Thus, the examination of MFN tariff liberalization and tariff preferences does not yield an unambiguous answer with regard to the question of whether PTAs impede progress towards multilateral tariff liberalization. We turn our attention next to non-tariff barriers.

4.5   Non-Tariff Barriers

Bhagwati (1993) and Bhagwati and Panagariya (1996) have argued that an additional worry with respect to PTA members is that they may resort to more aggressive use of various forms of administered protection against non-member countries, as administered protection is more elastic and manipulable by domestic players. Thus, while a PTA's structure, in the first instance, might not be trade diversionary, the endogenous trade policy choices made under the PTA may nevertheless yield a diversionary outcome.

In a recent study, Prusa (2011), has evaluated this possibility empirically by examining the use of trade remedy actions (specifically, antidumping duties) by PTA members. The study covers worldwide antidumping activity since 1980 and includes nearly 5000 antidumping cases initiated by WTO members belonging to at least one PTA. The study proceeds in two steps. First, the number of antidumping disputes initiated by PTA members against other PTA members ("intra-PTA filings") is calculated for each importing country, with the goal of comparing trends in intra-PTA filings before and after the formation of the PTA. In a second step, in order to control for global trends in antidumping filing activity, trends in intra-PTA filings are compared with trends in filings by PTA members against non-member countries. The results are striking. In the pre-PTA period, 58 percent of the filings are against non-PTA countries and 42 percent were against PTA members. By contrast, in the

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post PTA period, 90 percent of the cases were against non-PTA countries while only 10 percent were against PTA members. As Prusa (2011) notes, these results "clearly raise the specter of protection diversion and more subtle forms of trade diversion" and that even if "tariff preferences are small and might result in only small amounts of trade diversion", it appears that "other provisions of a PTA might be a greater source of discrimination". On the other hand. Mavroidis and Sapir (2016) have evaluated the question of whether entering into a PTA reduces the frequency of trade litigation between PTA partners and argue that PTA formation is correlated with fewer trade disputes that are brought up at the WTO's dispute settlement court.

4.6   PTAs and Deep Integration

Recently, it has begun to be argued that the motivation for PTAs may have little to do with the lowering of trade barriers, as such, and that PTAs should be understood instead as vehicles for undertaking "deeper" forms of integration to achieve institutional harmonization with partner countries. The institutional and policy dimensions along which this harmonization is sought include both provisions that currently fall under the mandate of the WTO and are subject to some level of commitment in WTO agreements (such as the improvement of customs administration and rules concerning public procurement) and those that currently fall outside of mandate of the WTO (such as provisions on investment measures, labor market regulations, innovation policy and human rights).

To examine the extent of deep integration undertaken in PTAs, we use a dataset recently compiled by the WTO for its 2011 publication of the World Trade Review. This dataset codifies these institutional provisions in over a hundred PTAs notified to the WTO, and additionally indicates which of these provisions are deemed to be legally enforceable.[21]

The picture is a mixed one. On the one hand, a number of provisions covered by the WTO

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[21]Other recent datasets have also been developed to quantify the degree of "deep integration" embodied in PTAs. Like the WTO dataset, Kohl et al. (2016) focus on the "scope" or "horizontal depth" of PTAs. Alternatively, Dür et al. (2014) focus on the "vertical depth" of policy areas within PTAs.

are also mentioned in the text of these PTAs and many appear to have legally enforceable status. Thus, over 65 percent of the PTAs in the database include legally enforceable provisions on customs administration, nearly 50 percent of the PTAs include prohibitions on export taxes and slightly over 50 percent include provisions on the administration of antidumping duties. A smaller, but still significant, fraction include provisions on the liberalization of services and trade related intellectual property rights and investment measures.

On the other hand, provisions that fall outside of the WTO mandates but are covered by PTAs and are also deemed legally enforceable by the text of the PTA are far fewer in number. Only 4 percent of the PTAs include legally enforceable provisions on anti-corruption measures, 12 percent include provisions on labor regulation, and 11 percent include provisions on environmental regulations. Regulations on the movement of capital and the protection of intellectual property rights (specifically accession to international treaties not included in the GATS) are more significant at 40 percent and 34 percent respectively, but most of the remaining provisions are simply not referenced in the vast majority of PTAs. This, in itself, permits some skepticism on how much deeper PTAs, on average, have gone beyond the possibilities offered by the WTO. Whether or the not the enforceable provisions will have significant economic effects (for instance, whether provisions on cross-border investment will yield greater flow of investments) remains an open question for future research.

Separately, it has begun to be argued that the fragmentation of global production provides a new basis for countries to achieve preferential integration regionally and at a "deeper" level (see WTO (2011) for a comprehensive discussion). While this argument is gaining currency in some quarters, it would seem that production fragmentation should provide greater incentives instead for broader multilateral liberalization. After all, the most efficient producers of any given intermediate good need not lie within the jurisdictional boundaries of any specific PTA and the identity and location of the efficient producers of intermediates may be expected to vary faster than any country's ability to sign new PTAs. Furthermore, with increased fragmentation the identification of the origin of goods, so that preferences may be suitably

granted, is itself a major challenge. As a practical matter, if PTAs were designed to support fragmented production networks, one might expect to see greater geographic concentration of trade over time as many production networks are regional in nature. As the WTR notes, however, the share of intra-regional trade in Europe has remained roughly constant at around 73 percent between 1990 and 2009. While Asia's intra-regional trade seems to have risen from 42 to 52 percent during the same period, North America's intra-regional trade shares rose from 41 percent in 1990 to 56 percent in 2000 and fell back to 48 percent in 2009.

In any event, it is not obvious that the achievement of "deep integration" at a regional level is a desirable goal from either a regional or multilateral perspective. Common policies may benefit countries with common policy preferences, but may be costly if there are wide differences in the preferences of member countries (as is often the case with provisions involving environmental and labor standards, for instance). In the context of North-South agreements, there is an additional concern that the greater resources and organizational ability of government and sectoral lobbies in the North will shift policy in a direction that is closer to their own interests and away from the interests of the South. Furthermore, the establishment of policies and standards at a regional level may inhibit multilateral liberalization if the multilateral standards vary from regional ones and there are costs to switching standards. It is also conceivable that different regional agreements follow quite different templates making future harmonization difficult, even at the regional level. The possibility of negative spillovers on non-member countries also cannot be ignored. This remains an important area for future research.

5 Conclusions

The question of trade preferences is a complex one. This survey chapter has discussed some of the major research trends in this area – in the welfare theoretic analysis of PTAs, the implications of PTAs for the multilateral trade liberalization, and the empirical analysis

that has been undertaken in this area. A number of open research questions have been identified.

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