Duration and Term Structure of Trade Agreements*

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Abstract

Why some trade agreements are concluded for a limited period of time while others have the form of evergreen contracts supplemented with a clause requiring an advance termination notice? We employ the recent advances in contract theory to demonstrate that the time structure of the trade agreement is related to the nature of the underlying trade-related investments (or other types of irreversible resource adjustments). If these investments are lumpy and specialized to trade in a single homogeneous good, the agreements with the fixed term of duration are more likely. The fixed-term agreement provides incentives for the initial investment but leaves the parties the flexibility to revisit the need for future investment by resorting to renegotiation. If the agreement covers trade in goods requiring incremental and "leaky" investments, the risk of overinvestment is more diversified due to the spillovers of the investment benefits. Therefore, the parties, which are concerned with the costs of renegotiation, are more likely to conclude an evergreen agreement (with an advance termination notice or an escape clause).

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1 Introduction

The vast majority of WTO members are signatory to one or more regional trade agreements (RTAs) which in the WTO parlance refers to all bilateral, regional or plurilateral trade agreements of a preferential nature. The proliferation of regionalism has continued unabated since the early 1990s. More than 250 bilateral and plurilateral free trade agreements and customs union agreements have been notified to the GATT/WTO up to December 2002, of which 130 were notified after January 1995. Over 170 RTAs are currently in force; an additional 70 are estimated to be operational although not yet notified. By the end of 2005, if bilateral and plurilateral trade agreements reportedly planned or already under negotiation are concluded, their total number might exceed 300.

Trade agreements are rarely permanently binding upon the signatory parties. Most bilateral and plurilateral trade agreements and treaties expressly allow a state to withdraw as long as it follows certain procedures of notification. These are usually described in a final clause that contains provisions for the agreement's duration, termination or for the withdrawal of a party.

While some trade agreements are concluded for unlimited period and allow contracting parties to withdraw from or denounce the agreement at any time by giving an advance notice to the other contracting party (parties), others stipulate trade for a predefined period of time on fixed terms. The final clauses of the agreements of the second type may contain a non-binding statement about the possibility of renewal based on the mutual consent of the parties. Following the recent contract-theoretic literature we refer to the former type of trade agreements as *evergreen* with advanced withdrawal (or termination) notice and the latter type as *fixed-term*.

For example, multilateral and plurilateral agreements which are parts of the WTO compact are evergreen contracts with advance termination notice varying from 12 months (the Agreement on Trade in Civil Aircraft) to 60 days (the International Dairy Agreement and the International Bovine Meat Agreement). Other examples of evergreen trade agreements include the 1992 EC-US Agreement on Trade in Large Civil Aircraft (12-month advance notice)[1], the 2004 Euro-Mediterranean free trade area negotiated among the European Union, Israel, Morocco, Tunisia, Jordan and Egypt (6-month advance notice); the 2001 agreement between Armenia and Kazakhstan (6-month advance notice); the 1997 Agreement on Arab Free Trade Area (12-month advance notice). The examples of fixed term bilateral trade agreements include the 2001 agreement between Turkey and Jamaica (5-year duration); the 1996 Canada-U.S. Softwood Lumber Agreements (5-year duration); a series of rather short-term agreements concluded in the 1960s-90s between India and Tanzania (with the duration ranging from 1 to 2 years) and India and Bangladesh (with the duration from 2 to 3 years) and a series of the Lomé Convention trade-and-aid agreements between the EU and a number of developing African, Caribbean, and Pacific countries, which were concluded for fixed terms ranging from 5 to 10 years.

[1] The 1992 EC-US Agreement on Large Civil Aircraft stipulated that in exceptional circumstances, a party may terminate the agreement within 15 days following consultations concerning a matter leading to termination. In October 2004, the United States exercised its right to terminate the Agreement by sending a diplomatic note to the European Union's Council of Ministers.

A review of final clauses in a large number of bilateral and plurilateral trade agreements suggests that fixed terms agreements are more common between parties whose bilateral trade is mostly in homogeneous goods (e.g., commodities). This is the reason why most of the fixed term agreements either include a commodity exporting developing country as at least one of the parties (e.g., Lomé Convention, India-Bangladesh, and Turkey-Jamaica agreements) or concern sectoral trade between developed countries in a homogeneous commodity (e.g., lumber, oil, or gas). On the other hand, evergreen bilateral trade agreements (with advance notice) are characteristic of countries which trade primarily in manufacturing goods and services. That is why bilateral trade agreements between developed countries usually have unlimited duration. We have studied all the bilateral and plurilateral trade agreements to which the U.S. is a party and which are currently in effect (see Appendix B) and have found that it is indeed true that agreements are more likely to be of fixed duration as opposed to being evergreen if they cover trade in commodities and if they are concluded with less developed countries (see Table 1). Moreover, the agreement is more likely to cover the trade in commodities even if we control for the partners' level of development and democracy (see Appendix B).

Table 1. Characteristics of fixed-term and evergreen trade agreements based on the comprehensive sample of the US trade agreements. Standard errors are in parentheses. Source: US Trade Compliance Center (see Appendix B for details). All the differences are statistically significant at 1% level.

	Fixed-term	Evergreen
Total number	30	68
Per cent covering trade in commodities	0.77 (0.08)	0.49 (0.06)
Log (GDP per capita of trade partners at the time of signing)	7.4 (0.2)	9.0 (0.2)
GDP per capita of partners as a share of the US GDP per capita (at the time of signing)	0.17 (0.05)	0.53 (0.06)

In order to understand the time structure of the trade agreements, one has to examine first the factors determining the length of the time period during which the countries choose to be bound by the obligations in a treaty. One of the first arguments related to the issue of the trade agreement's duration was provided in a seminal paper by MacLaren (1997) who suggested that the long-term agreements protect incentives for irreversible trade-related investments and intersectoral resource adjustments (e.g., labor and capital reallocations in and out of the export sector). Indeed, without durable trade agreements, such investments and resource adjustments are vulnerable to holdup by the trading partner.[2] While the benefits of lasting

[2]Irreversible and costly trade policies often involve direct investments by governments. Although the wisdom of industrial targeting and export promotion policies have been questioned in the economics literature, it is undeniable that governments throughout the world often resort to these policies (see Hausmann and Rodrik, 2006). Moreover, as pointed out by Hausmann

trade agreements are compeling, they also involve certain costs. As desired trade policies may change dramatically over a short period of time because of economic and political shocks, renegotiating the policy commitments fixed in an agreement may be quite costly. The presence of these costs and benefits makes the analysis of trade agreements similar to the incomplete contract theory (Grossman and Hart, 1986, Hart, 1995) and in particular to the theory of incomplete contracts on time (Guriev and Kvasov, 2005). The parties choosing the duration of the contract, have to resolve the incentive-flexibility trade-off. If the term of the trade agreement is too short, there will be no incentives to invest; if it is too long, it will reduce the parties' flexibility to react to external shocks; moreover even if the parties renegotiate the outdated agreement, the outcome of renegotiation may provide excessively strong investment incentives. The risk of over-investment or of over-specialization is as tangible as that of under-investment. Moreover, this risk is costly for both trade partners, not only for the investing party. Indeed, in a bilateral trade relationship, if the exporting country wants to specialize in a particular export sector, it would require guaranteed terms of market access in the importing country for a sufficiently long period of time to prevent the risk of hold up. The greater the exporting country's trade-specific investment, the larger is the compensation the importing country has to provide to the exporting country for the upfront investment costs by expanding the duration of its market-access obligations. This is why many countries are reluctant to sign long-term trade agreements even if there are substantial mutual benefits. A good example is the ongoing debate among the EU governments on signing an agreement with Russia on the long-term supply of natural gas. The terms of agreement proposed by Russia include a large-scale investment into a gas pipeline which Russia can undertake in exchange for guaranteed long term contracts committing the EU to purchasing Russia's gas. The EU governments are reluctant to sign the agreement on Russia's terms because of the uncertainty about the direction of the energy markets.

Therefore the optimal time structure of the trade agreement should take into account the trade-off between providing efficient incentives for investment today and making sure that there will be no overinvestment tomorrow. Fixed-term contracts and evergreen contracts help resolve this tradeoff in very different ways. The distinction can be illustrated with the following example of simple bilateral agreements designed to encourage trade-related investments. The parties can sign either a free trade agreement for θ years or an evergreen agreement with the advance termination-notice period α (or with an escape clause). Next year, an investment opportunity may arise. With probability p this investment project will be socially optimal (i.e., it improves the joint welfare of the countries) and should be undertaken, and with probability q it will be socially suboptimal and should not be carried out. With probability $1-p-q$ there will be no opportunity for undertaking the project.

and Rodrik, export-oriented economic activities often require specific inputs for which the market does not operate and which have characteristics of public goods (e.g., regulations, standards, certification, accreditation, provision of certain elements of infrastructure). Many of these public goods differentially benefit particular economic activities. In this case, it is unavoidable that governments engage in active industrial policies in the sense of providing public assets with high degree of specificity to economic activities.

If the trade agreement has a fixed term of duration θ, next year the parties only have $\theta - 1$ years remaining under the contract, which represents insufficient incentives for undertaking the investment project if it arrives. If the investment project is jointly optimal, the parties have to renegotiate and replace the agreement with a new one for θ years. Under the evergreen agreement, the opposite is true. Next year, the agreement will provide the very same incentives to invest as this year. This means that if the investment is optimal, there is no need to renegotiate. However if it is suboptimal, parties have to scrap the agreement because otherwise the foreign country will invest and over-specialize. Therefore the choice of the agreement will depend on how costly renegotiation is and whether p or q is higher. If the risk of overinvestment is large (i.e., q is high), a fixed-term agreement will do better. If, on the other hand, the main danger is the future underivestment (i.e., p is high) and renegotiation is costly, the parties will choose the evergreen type of agreement.

Even though renegotiation costs may be substantial they are certainly much less than the potential losses due to the inefficiency of the trade agreement. Therefore the inefficient agreement will always be renegotiated. If the trade agreement provides incentives for a 'value-destroying' investment, it will be replaced by another agreement once the investment opportunity arrives. If the trade agreement does not provide incentives for undertaking an investment when it is jointly optimal, a new trade agreement will take its place. On the other hand, as the renegotiation costs are not trivial,[3] the choice of the agreement should minimize the likelihood of such renegotiation.

The example above outlines the contours of the agreement which reduces the need for renegotiation. If the risk of overspecialization is relatively large, we should see the fixed-term trade agreement that provides incentives for investment today but discourages investment tomorrow. This is applicable to trade in commodities where supporting investments are typically one-off and lumpy. If such an investment turns out inefficient, the welfare cost may be very high for both parties. For example, if a long-term crude oil import agreement provides incentives for upgrading pipelines and oil terminals (i.e., trade-partner-specific and good-specific investments), then the optimally-designed agreement makes sure that the oil exporting party undertakes only those upgrades that are jointly efficient for the parties.

In the case of trade in less commoditized products, the situation is different. Production and transportation capacity related to trade in goods or services characterized by vertical or horizontal product differentiation is typically less lumpy as it allows small scale incremental investments aimed at improving a particular aspect (or module) of the traded product variety. Even more importantly, investments related to trade in goods characterized by greater product differentiation are typically "leaky" because of the spillovers of the investment benefits across related varieties of the differentiated product. These characteristics of investments in less commoditized (and more differentiated) goods lower the risk of over-investing in them. Indeed, an investment that enhances gains from trade in one product variety today will likely produce spillover benefits

[3] One has to take into account full economic costs of renegotiation, not only the direct legal costs. The full economic costs are related to the fact that trade negotiations take time; and each day of delays involves forgone gains from trade and unrealized investment opportunities.

that may enhance gains from trade in another variety tomorrow. For example, human capital investments in a country specializing in outsourced software design can be shared by a large number of software product varieties.[4]

As increasingly common in the recent trade literature, we assume that trade agreements are externally enforced (albeit incomplete) contracts. In principle, our argument could be made in a setting with self-enforced agreements. We choose the former setup for the the sake of simplicity. As we study agreements with clauses spanning over time, solving for equilibria in repeated games would be particularly cumbersome.

The rest of the paper is structured as follows. Section 2 provides a review of the related literature on trade and contract theory. Section 3 describes the setup of the model. In Section 4, we solve for incentives under the fixed-term and the evergreen trade agreements. Section 5 concludes.

2 Related literature

There are several relevant strands of literature. First, there is research on the dynamic effects of trade policy via irreversible investment. Krugman (1987) models the irreversible effects of trade policies in the context of dynamic economies of scale. In that paper, a temporary protectionist measure reduces gains from trade but provides incentives for investment in dynamic-economies-of-scale sector. Our paper is also close to the analyses conducted by MacLaren (1997) and Bond (2006) who considered the trade-off between the governments' need to protect irreversible trade-specific investment and the desire to maintain a degree of policy flexibility in the environment with uncertain terms of trade.[5] One implication of the MacLaren's and Bond's papers is that the costlier the trade partner-specific investment, the longer the duration of trade agreements. However, these papers do not provide any insights as to why some trade agreements are concluded for a fixed term and others are evergreen (with advance termination notice or a temporary escape clause).

To the extent irreversibility of trade-related investments or sluggishness in trade-induced resource adjust-

[4] The distinction we draw between the investments in the homogeneous commodity industry and the differentiated product industry is similar to the notion of the product space with the varying degree of relatedness among products, which was introduced in Hausmann and Klinger (2007) and Hidalgo, et al. (2007). These papers define the relatedness or distance between the goods through the degree of substitutability between the good-specific assets (e.g., human or physical capital, infrastructure, regulatory framework, and property rights regimes) required to produce the goods. Due to the varying degree of relatedness among goods and services some parts of the 'product space' are dense while others are sparse. This implies that countries that are specialized in a dense part of the product space have an easier time at changing their export mix than countries that are specialized in more disconnected products located in a sparse part. Hausmann and Klinger observe that the densest part of the product space tends to be dominated by manufactured products while homogeneous goods and commodities (e.g., oil, mineral ores, timber and cotton, and un-processed agricultural goods) are located in the sparse areas of the product space. They also provide evidence that in general, rich (poor) countries tend to be specialized in dense (sparse) parts of the product space.

[5] MacLaren (1997) models these investments as trade-partner-specific and irreversible specialization of human capital while Bond (2006) studies the case where parties invest in infrastructure to reduce trade costs. While these two setups are somewhat different, the main ideas carry on from one framework to the other one. For simplicity's sake, we follow Bond's approach.

ment plays a part in our analysis, explaining the duration and term structure of trade liberalizing agreements bears similarity to the question of why trade liberalization tends to be implemented gradually, rather than being introduced at once at the conclusion of the initial agreement. Staiger (1995), Devereux (1997) Furusawa and Lai (1999), have shown that the presence of rent earning factors in the import sector, learning-by-doing in the export sector, and the adjustment costs of moving resources in and out of the import-competing sector, can help to explain the gradual pace of trade liberalization. More recently, Bond and Park (2002) and Chisik (2003) have analyzed mechanisms leading to gradualism in trade liberalization which are based on, respectively, the consumption-smoothing incentives of a small country and the irreversibility of investments in the export sector. The main difference between this literature and our paper is that we depart from the assumption of self-enforced tariff commitments and model explicitly the factors affecting the countries choices regarding the duration and term structure of trade-liberalizing agreements.

Another closely related theme in the international economics literature is the effect of uncertainty in the trade environment on the structure of international trade agreements. The earlier papers by Bagwell and Staiger (1990, 2003, 2005), Riezman (1991), Rosendorff and Milner (2001) consider trade agreements negotiated and enforced in the presence of uncertainty about either the trade volume or terms of trade. All of these papers point out that self-enforcing trade agreements will unravel unless countries implement more protectionist policies during periods of trade volume surges to lessen their own incentives to defect. Therefore, these papers interpret periods of high tariffs legitimized by the safeguards and escape clauses of the GATT/WTO legal system not as instances of non-cooperative behavior but rather as an attempt by countries to maintain self-enforcing nature of international cooperation in the environment with volatile trade volume. In another closely related paper, Klimenko et al. (2006) consider the role of escape clauses in the environment with the terms-of-trade uncertainty when countries have to rely on exogenous enforcement of trade agreements because continuous renegotiation completely undermines the countries' ability to sustain self-enforced cooperation. In their setting, the ability of the escape clause to enhance the value of the trade agreement depends on the extent to which the information about the realizations of the stochastic terms-of-trade variable is verifiable by the dispute settlement body, which adjudicates disputes over alleged violations of trade agreements.

In this paper, we focus on another common clause in trade agreements, the advance notice for unilateral termination. The obligation to give the advance notice limits opportunities for hold-up and therefore protects the incentives to invest. Even if there is a shock that makes termination mutually beneficial, the advance notice of α periods provides the investing party with a guaranteed compensation of at least α-periods-worth of trade gains. In terms of our theory, the advance termination notice clause and the termporary escape clause perform similar functions: they protect the investment incentives. If a country prompted by a terms-of-trade shock invokes the escape clause for the duration of β periods and this temporary surge of protection affects the returns on investments undertaken by other members of the trade agreement, the country that invoked the escape clause has to provide its trade partners a compensation worth the sum of the trade gains for β periods promised to them under the terms of the agreement. Moreover, as discussed in detail in Bagwell

and Staiger (2005), the international legal system typically requires that after the expiration of the escape clause which lasted β periods, the earlierst time the escape clause can be invoked again is β periods after the end of previous escape clause. Therefore, the investing party is guaranteed the present value of the gains from trade for the period of $[t, t+2\beta]$ where t is the time when the escape clause is invoked the first time.

A relatively recent but fast-growing thread in the international economics literature emphasizes contractual incompleteness of international trade agreements which are enforced exogenously. Battigalli and Maggi (2003) examine the role of international agreements on product standards and show how the incompleteness of the trade agreements provides a role for a central dispute settlement mechanism. Horn, Maggi and Staiger (2005) consider trade agreements with endogenous level of contractual incompleteness determined by the contracting costs. Horn (2006) analyzes the role of the National Treatment principle of the WTO in overcoming contractual incompleteness of the international trade agreements. Maggi and Staiger (2008) assume that a dispute settlement institution (DSI) is able to choose the degee of contractual incompleteness of the trade agreement and characterize the DSI design that would be optimal for governments under various contracting conditions.

Our paper both builds on and contributes to the contract theory literature. Starting with Grossman and Hart (1986), the formal theory of holdup has emphasized the role of long-term contracts in protecting incentives for partner-specific investment. Our paper is most closely related to Harris and Holmstrom (1987) and Guriev and Kvasov (2005). Harris and Holmstrom model contract dynamics with positive renegotiation costs. Their rationale for long-term contracts is risk-sharing (between a risk-neutral employer and risk-averse employee) rather than investment incentives. Harris and Holmstrom analyze the trade-of between the costs and the benefits of renegotiation (due to the inefficiency of the obsolete contract) and solve for the optimal contract length. Guriev and Kvasov (2005) study incomplete contracts in continuous time and find the optimal contract duration that resolves the abovementioned incentive-flexibility tradeoff for both fixed-term contracts and evergreen contracts. In their basic model (which assumes that there are only two states of nature and renegotiation is costless), these two contract types are equivalent; either can implement the first best.

The contribution of the present paper to the contract theory literature is to emphasize the difference between the two types of contracts in a more realistic setting of trade agreements. We show that while the contract duration is chosen to provide incentives for investment at the inception of the contract, the availability of the alternative contract types allows for another degree of freedom. Having two distinct contract types helps to differentiate incentives for investment at the inception of the contract and at the contract's more mature stages. The fixed-term contract provides weaker incentives for the future investment than for the present investments. The evergreen contract protects the present and the future investments equally well. Therefore investment incentives depend not only on the duration of the contract but on the type of the contract. This is turn implies that the choice of the contract type depends on both the present and the future investment characteristics as well as on the renegotiation costs.

3 Setup

We consider a discrete time model of trade between two countries, home and foreign. In every period, countries can trade and the foreign country can make a trade-related investment which reduces its cost of exporting to the home country in the future periods. We begin our analysis by assuming that the foreign country exports a single homogenous good (i.e. a commodity). The foreign country's trade-cost-reducing investment in the homogeneous good industry is 'lumpy', which is captured by the assumption that in every period the foreign country's investment is either 0 or 1. This assumption is intended to represent the difference between trade-facilitating investments for the homogeneous good industry and the non-commoditized (i.e., differentiated) good industry. The examples of such lumpy investments intended to facilitate trade in homogeneous goods include the construction of large scale transportation or storage facilities for commodities (e.g., ports, oil terminals, oil or gas pipelines, electricity grids). By contrast, the main characteristics of investments in the differentiated product industry is their leaky nature. While each product variety requires an individual trade-related investment, the accumulated stock of these investments is generic to the entire industry because of the spillovers of investment benefits across product varieties. To make the scale of investments in the differentiated product industry and the homogeneous good industry comparable, we assume that there is a continuum of differentiated product varieties of measure 1 and the investment for each variety can also be either 0 or 1. Because of its "leaky" nature, the investment reducing the cost of trade for variety i also reduces the trade cost for variety j.[6] Therefore, in each period the expected volume of trade-related investments in the differentiated good industry is between 0 and 1, i.e., exactly as in the homogeneous good industry. But since investments in the differentiated good industry are undertaken independently for each variety, they do not have the all-or-nothing property of the lumpy investment in the homogeneous industry. In fact, investments for individual product varieties incrementaly increase the capacity of the entire differentiated good industry.

3.1 Trade and trade-related investments

The stage game is derived from the basic two-country, two-good framework previously considered by Johnson (1953/54), Mayer (1981) and Dixit (1987). We provide only a terse review of the main elements of this framework. The countries home (no $*$) and foreign ($*$) exchange two goods x and y. The home country exports good y in exchange for imports of good x from the foreign country. In this subsection, we assume that both x and y are homogenous goods. In the subsection 3.4, we will consider an alternative setup where x represents a differentiated product with a continuum of possible varieties.

Both countries are large enough to affect the terms of trade through an import tariff, which is the

[6] The difference between the two types of goods can be seen in the following example. In the case of commodities, such as lumber, oil, gas, the requisite investments usually have a very high degree of specificity and are useless for the production of any other goods (gas pipeline is a lumpy indivisible investment; also, it cannot be used for selling oil). By contrast, in software design or consulting services, each variety is different and trade-promoting investments in individual varieties are small and independent, but these investments can be reused for a large variety of differentiated products or services.

only policy instrument available to the countries' governments. Although good y can be shipped costlessly, importing good x from the the foreign to the home country is costly. The per unit cost of shipping good x from the foreign to the home country $v = v(K^*)$ is a decreasing function of capital stock of trade-related infrastructure K^*. When there is an opportunity, the foreign country can increase the stock of the infrastructure K^* by making an investment. K^* is specific to the relationship between the home and the foreign countries and cannot be used to reduce trade costs with other potential trade partners. For simplicity we assume that the per period investment is a binary variable: $\phi = \{0, 1\}$. The cost of investment is c. The investment opportunities arrive at a Poisson rate σ.

We follow the earlier literature on political economy of trade policy (e.g., Baldwin (1987), Bagwell and Staiger (2005)) and assume that each government seeks to maximize a *weighted sum* of the producer surplus, the consumer surplus and the tariff revenue, with a relatively greater weight on the *import-competing producer surplus*. Specifically, let $\gamma > 1$ denote the weight placed by the domestic government on its import-competing producer surplus. Then the single-period welfare functions of countries given tariff choices τ and τ^* and the transportation cost $v(K^*)$ are denoted by $U(\tau, \tau^*, \gamma, K^*)$, $U^*(\tau, \tau^*, K^*)$. We make a number of conventional assumptions on $U(\tau, \tau^*, \gamma, K^*)$ and $U^*(\tau, \tau^*, K^*)$ to ensure the existence of static best response functions that generate Nash equilibria in tariffs.[7] High tariffs τ or τ^* lead to the autarky outcome, in which welfare levels of both countries are taken to be zero. For lower levels of τ and τ^*, trade volume is positive, and the welfare function of each country is strictly positive, differentiable and strictly quasi-concave in the country's tariff level.

Let $\widehat{\tau}(\tau^*, \gamma, K^*)$ and $\widehat{\tau}^*(\tau, K^*)$ be the values of τ and τ^* that maximize the respective welfare functions of the two countries, i.e., the country's best response tariffs. Given that γ is the weight of the import-competing producer surplus in the home country welfare, it is natural to assume that $\widehat{\tau}_\gamma > 0$. The Nash equilibrium tariffs are denoted by $\widehat{\tau}^N(\gamma, K^*) > 0$ and $\widehat{\tau}^{*N}(K^*) > 0$. We assume that all realizations of γ are sufficiently high that the home country's Nash equilibrium tariff is prohibitive, i.e., it precludes imports from the foreign country.[8] (Since we allow that foreign country's Nash equilibrium tariff can be non-prohibitive, there is some one-way trade in the Nash equilibrium.) The Nash equilibrium welfare levels are $U^N(\gamma)$ and $U^{*N}(\gamma)$.

The joint welfare of the two countries is given by $\widetilde{U}(\tau, \tau^*, \gamma, K^*) \equiv U + U^*$ (hereinafter we will use tilde for the joint variables). We assume that $\widetilde{U}_\tau < 0$, $\widetilde{U}_{\tau^*} < 0$, so that freer trade increases the joint welfare. The jointly optimal home tariff is strictly positive, albeit non-prohibitive, for all realizations of $\gamma > 1$: $\tau^E(\gamma) > 0$, $\tau^{*E}(\gamma) = 0$ (the superscript "E" stands for "efficient").

[7] For example, following Dixit (1987) we assume that balanced-trade and Marshall-Lerner conditions are satisfied. This ensures that one country's unilaterally-optimal tariff creates a negative terms-of-trade externality for the other country. Although the phrase "terms-of-trade externality" is rarely used in the parlance of real-world trade-policy negotiators, as Bagwell and Staiger (2002) demonstrate in their recent monograph, the concepts "terms-of-trade gain" and "market-access restriction" describe the single economic experience that occurs when the importing country government raises its import tariff and restricts foreign access to its market.

[8] This is for the technical simplicity's sake only. Our results extend to general cases in which there are Nash equilibriua with non-prohibitive tariffs. However, the more general cases require more notation and additional modeling details.

Given our interpretation of γ, it is natural to assume that its reduction implies a lower jointly-optimal tariff ($\tau_\gamma^E > 0$) and a greater volume of import in the home country, which increases the marginal effect of the foreign infrastructure investment on the home country welfare: $\frac{\partial U(\tau,\tau^*,\gamma,K^*)}{\partial\gamma\partial K^*} < 0$. The foreign country can invest either $\Delta K^* = 0$ or $\Delta K^* = 1$ per period; the cost of investment is $c\Delta K^*$.

The parties discount the future at the common discount rate ρ. (We assume that the capital stock does not depreciate; non-trivial depreciation rate would simply be added to ρ)

The countries' marginal per period payoffs from the investment are $u(\tau,\tau^*,\gamma) = \frac{\partial U(\tau,\tau^*,\gamma,K^*)}{\partial K^*}$ and $u^*(\tau,\tau^*) = \frac{\partial U^*(\tau,\tau^*,K^*)}{\partial K^*}$. The joint per period payoff is given by $\widetilde{u}(\tau,\tau^*,\gamma) \equiv u(\tau,\tau^*,\gamma) + u^*(\tau,\tau^*)$. We introduce a linearization $U^*(\tau,\tau^*,K^*) = U^*(\tau,\tau^*,K_0^*) + \frac{\partial U^*(\tau,\tau^*,K_0^*)}{\partial K^*}(K^* - K_0^*) + o(K^* - K_0^*)$ and assume that maximum per period investment $\Delta K^* = 1$ is small compared to K^*. This assumption allows us to neglect the higher-order terms of the Taylor expansion in the neighborhood of K_0^*. Therefore the effect of investment on future payoffs will be linear.[9]

During each period, parties can renegotiate the previously concluded agreements. The cost of renegotiation is κ per period. Since this cost is small relative to joint gains from amending the agreement, renegotiation will always happen in equilibrium. However, because the renegotiation costs are not trivial, the parties choose the contract that minimizes these costs.

Finally, we assume that all the bargaining power belongs to the home country.

3.2 Uncertainty

The home country's domestic political economy parameter γ changes over time. For simplicity, we assume that this parameter has only two realizations: γ can be high $\gamma = \gamma^P$ (i.e., consistent with the protectionist stance of the home government) or low $\gamma = \gamma^L < \gamma^P$ (i.e., consistent with the liberal trade-policy stance of the home government). In the latter case, liberal trade policy is globally optimal (i.e., maximizes joint welfare of the two countries), while if $\gamma = \gamma^P$, the global optimum involves higher trade barriers.

We distinguish between three states of nature: "Good", "Medium", and "Bad" (G, M, and B, respectively). In both G and M states, $\gamma = \gamma^L$, while in the state B, $\gamma = \gamma^P$. The difference between the G and M states is that there is no direct transition between states G and B. Essentially, if the state is G, everyone knows that protectionist preferences are unlikely. While if the present state is M, the state B is likely to arrive next period.

[9] In principle, one can argue for either convex or for concave relationship between the foreign country's investment and welfare. On one hand, the investment cost functions are usually convex. On the other hand, the effect of the infrastructure investment on the welfare is likely to be concave – the more we have invested the greater amount is traded, hence the higher return to investment. As it is hard to determine the nature of the ultimate effect of K^*, we use a linear function as the first approximation. A non-linear relationship would imply similar results but require more cumbersome derivations.

Linearization also simplifies the role of depreciation. If the linearity assumption holds, depreciation does not affect incentives to invest.

Formally speaking, we consider a Markov process where the transitions between the three states occur at given rates. The transitions from state M to states G and B take place at the rates μ_G, μ_B, respectively. For simplicity, we assume that transitions to M out of both G and B states occur at the same rate λ. Each row in the transition matrix below represents the probability distribution of the state in the next period s_{t+1} given the current state s_t :

	$s_{t+1} = G$ $(\gamma_{t+1} = \gamma^L)$	$s_{t+1} = M$ $(\gamma_{t+1} = \gamma^L)$	$s_{t+1} = B$ $(\gamma_{t+1} = \gamma^P)$
$s_t = G$ $(\gamma_t = \gamma^L)$	$1-\lambda$	λ	0
$s_t = M$ $(\gamma_t = \gamma^L)$	μ_G	$1-\mu_G-\mu_B$	μ_B
$s_t = B$ $(\gamma_t = \gamma^P)$	0	λ	$1-\lambda$

We use $p_{t,s}$ to denote the probability of being in state $s = G, M, B$ at time t. Given the initial distribution $(p_{0,G}, p_{0,M}, p_{0,B})$, these probabilities are given by:

$$\begin{aligned}
p_{t,G} &= \overline{p}_G + (p_{0,G} - \overline{p}_G)(1-\lambda)^t + \frac{\mu_G}{\mu_G+\mu_B}(p_{0,M} - \overline{p}_M)\left[(1-\lambda)^t - (1-\lambda-\mu_G-\mu_B)^t\right], \\
p_{t,M} &= \overline{p}_M + (p_{0,M} - \overline{p}_M)(1-\lambda-\mu_G-\mu_B)^t, \\
p_{t,B} &= \overline{p}_B + (p_{0,B} - \overline{p}_B)(1-\lambda)^t + \frac{\mu_B}{\mu_G+\mu_B}(p_{0,M} - \overline{p}_M)\left[(1-\lambda)^t - (1-\lambda-\mu_G-\mu_B)^t\right],
\end{aligned}$$

where $\overline{p}_s$ denotes the steady state distribution:

$$(\overline{p}_G, \overline{p}_M, \overline{p}_B) = \left(\frac{\mu_G}{\lambda+\mu_G+\mu_B}, \frac{\lambda}{\lambda+\mu_G+\mu_B}, \frac{\mu_B}{\lambda+\mu_G+\mu_B}\right). \tag{1}$$

The steady state probabilities $\overline{p}_s$ can be derived in either of two ways. First, these probabilities are the limit distribution for $t \to \infty$: $\overline{p}_s = \lim_{t\to\infty} p_{t,s}$. Alternatively, $\overline{p}_s$ is the eigenvector of the transition matrix: if the present state is $p_{t,s} = \overline{p}_s$, then it will be the same next period $p_{t+1,s} = \overline{p}_s$.

Note that we introduce *three* states even though there are only *two* realizations of the home country political economy parameter γ. This makes the structure of uncertainty sufficiently rich to separate trade policy and investment decisions. While trade is optimal in states G and M, investment should only take place in state G. In state G, it is optimal both to set low tariffs and to invest (as high level of γ is relatively unlikely to occur in the future). In state B, it is optimal to set higher tariffs and trade at a lower level so that investment does not pay off. In the intermediate state M, parties trade at the same level as in the state G (as the level of γ is low) but do not invest (as the protectionist preferences $\gamma = \gamma^P$ are likely to arrive in the future).

We shall also introduce another source of uncertainty: the availability of the investment opportunity. Investment at time t is only possible if there is an investment opportunity. We assume that investment opportunity is available with probability σ; there is no investment opportunity with probability $1-\sigma$. The arrivals of investment opportunities are independent across time periods.

3.3 Timing

The timing is as follows.

– Period t begins. State transition is realized. Parties observe the state $s = G, M, B$ and the political economy parameter $\gamma = \gamma^P, \gamma^L$. Investment opportunity arrives (with probability σ) or does not arrive (with probability $1-\sigma$).

– Parties choose whether to trade according to an agreement signed in previous periods or to renegotiate. The renegotiation may replace the existing agreement with a new long-term or spot trade agreement, or the Nash equilibrium tariffs. Renegotiation incurs cost κ.

– If there is an investment opportunity, the foreign country decides whether to invest.

– Trade occurs. Period t ends.

3.4 Social returns to investment

We will first consider the first best for the homogenous good case, then extend the analysis to the setup where x is a differentiated product.

Homogenous good.

The first best level of trade depends on the current state of nature. The jointly optimal tariffs are $\tau^E(\gamma), \tau^{*E}(\gamma)$. The level of trade is higher in the states G and M (when $\gamma = \gamma^L$).

Let us now solve for the optimal investment decision (contingent upon the arrival of an investment opportunity). Investment raises welfare in all states, but the immediate effect of investment is lower in the state B (when γ is high) than in the state M and G (and it is the same in M and G states). We denote the joint per-period return to investment in these states by $\widetilde{u}^L \equiv \widetilde{u}\left(\tau^E(\gamma^L), \tau^{*E}(\gamma^L), \gamma^L\right)$ and $\widetilde{u}^P \equiv \widetilde{u}\left(\tau^E(\gamma^P), \tau^{*E}(\gamma^P), \gamma^P\right)$, respectively. As assumed above, the joint return to investment is higher under the liberal trade policy: $\widetilde{u}^L > \widetilde{u}^P$.

The decision to invest should take into account the expected global returns to investment which include the returns in the current state as well as the future transitions to other states of nature. Let $\widetilde{W}_s$ be the expected social returns to investment where $s = G, M, B$ is the initial state. Once the investment opportunity

arrives in the state s, investment is optimal whenever $\widetilde{W}_s > c$. By definition,

$$\begin{aligned}
\widetilde{W}_G &= \frac{1}{1+\rho}\left[\widetilde{u}^L + (1-\lambda)\widetilde{W}_G + \lambda\widetilde{W}_M\right] \\
\widetilde{W}_M &= \frac{1}{1+\rho}\left[\widetilde{u}^L + (1-\mu_G-\mu_B)\widetilde{W}_M + \mu_G\widetilde{W}_G + \mu_B\widetilde{W}_B\right] \\
\widetilde{W}_B &= \frac{1}{1+\rho}\left[\widetilde{u}^P + (1-\lambda)\widetilde{W}_B + \lambda\widetilde{W}_M\right]
\end{aligned}$$

where $\rho > 0$ is the discount rate.

This system has the following unique solution:

$$\begin{aligned}
\widetilde{W}_M &= \frac{\widetilde{u}^L(\rho+\lambda+\mu_G) + \widetilde{u}^P\mu_B}{\rho(\rho+\lambda+\mu_G+\mu_B)} \\
\widetilde{W}_G &= \frac{\widetilde{u}^L\left[(\rho+\lambda+\mu_G)(\rho+\lambda)+\rho^2\right] + \widetilde{u}^P\mu_B\lambda}{\rho(\rho+\lambda+\mu_G+\mu_B)(\rho+\lambda)} \\
\widetilde{W}_B &= \frac{\widetilde{u}^L(\rho+\lambda+\mu_G)\lambda + \widetilde{u}^P\left[\mu_B(\rho+\lambda)+(\rho+\lambda+\mu_G)\rho\right]}{\rho(\rho+\lambda+\mu_G+\mu_B)(\rho+\lambda)}
\end{aligned}$$

One can easily check that $\widetilde{u}^L > \widetilde{u}^P$ implies $\widetilde{W}_B < \widetilde{W}_M < \widetilde{W}_G$. In state G, the expected returns to investment are high, as the parties expect relatively long period under low tariffs; in the states B and M, longer periods of protectionism are more likely.

Differentiated goods.

Now consider the case of the differentiated product. The per unit cost of trade depends on the aggregate stock of capital $K^* = \int_0^1 K^{*i} di$. As there is a continuum of product varieties, exactly $\overline{p}_s$ per cent of the varieties are in the state $s = G, M, B$. Whenever there is an investment opportunity for variety i, the investment costs c and leads to the expected joint returns of $\overline{W} = \sum_{s=G,M,B} \overline{p}_s \widetilde{W}_s$.[10]

We assume that the parties can only set one tariff for all varieties. Let us denote $\overline{\tau^E}$ the jointly optimal tariff for the case of differentiated goods. By definition, this tariff is between $\tau^E(\gamma^L)$ and $\tau^E(\gamma^P)$, and is below the Nash equilibrium tariff.

Assumptions.

Throughout the paper we assume that investment is optimal if the good is differentiated, or if the good is homogenous and the state is G. If the good is homogenous, but the state is M or B, there should be no investment.

Assumption A1. The parameters are such that:

$$\widetilde{W}_M < c < \overline{W}. \tag{2}$$

This assumption implies $\widetilde{W}_B < c < \widetilde{W}_G$ since $\widetilde{W}_B < \widetilde{W}_M$ and $\widetilde{W}_G > \overline{W}$.

[10] This formula assumes that infrastructure is used randomly across sectors in different states. If the capital is allocated in a non-random way, the condition (2) below would be even less demanding.

The assumption allows us to focus on the most interesting case. Otherwise, either $\overline{W} < c$, and there is no need for investment in the differentiated good case (and the parties are better off not signing any trade agreement), or $\widetilde{W}_M > c$, and the state M is not different from the state G as in both states it is optimal to set low tariffs and invest.

This assumption implies that in the case of differentiated goods with leaky investments the countries would rather sign the trade liberalizing agreement rather than choose the Nash equilibrium tariffs (the inequality is equivalent to $(\overline{p}_G + \overline{p}_M)\,\widetilde{U}^E(\gamma^L) + \overline{p}_B\widetilde{U}^E(\gamma^P) \geq (\overline{p}_G + \overline{p}_M)\,\widetilde{U}^N(\gamma^L) + \overline{p}_B\widetilde{U}^N(\gamma^P)$).

3.5 First best

The above analysis and assumptions allow describing the first best. In the case of the homogenous good, the free trade is optimal in the states G and M while the investment is only socially optimal in the state G. The uncertainty is sufficienly rich to decouple trade and investment decisions: in the state M the current preferences are pro-trade, so it is optimal to reduce tariffs but the protectionist preferences are likely to emerge in the future hence investment does not pay off.

In the differentiated good case, where exactly $\overline{p}_s$ varieties are in the state $s = G, M, B$, both free trade and investment are socially optimal.

4 Trade agreements and investment

Suppose an investment opportunity arises. We first derive the incentives to invest under different contract types starting with the case of a homogenous good. Then we solve for the differentiated good case. After that, we compare the renegotiation costs for each case for different types of contracts. Notice that we assume that in the case of the differentiated good, the tariff fixed in the trade agreement applies to all varieties of the differentiated good.

4.1 Null contract

We shall first consider the case of a null contract: countries do not conclude a long-term agreement. The terms of trade are negotiated on the spot. Since the home country is assumed to have full bargaining power, the foreign country's payoff is equivalent to its payoff under the Nash equilibrium. The return to investment is therefore trivial and foreign country does not invest. As we will show below as long as renegotiation costs are low relative to the returns to investment, the null contract is outperformed by other contracts.

4.2 Fixed term agreement

The parties sign a contract to trade for θ periods with the tariffs τ, τ^*. (If θ is not an integer, trade in the last period occurs with a probability $\theta - int(\theta)$). Under this contract, the foreign country's payoff does not

depend on γ; therefore the foreign country's returns to investment only depend on the contracted tariffs τ, τ^* and not on the state s.

Let $u^* = u^*(\tau, \tau^*)$ be the one-period return to investment and V_θ^* the expected discounted returns to investment received by the foreign country given the contract with tariffs τ, τ^* and the duration θ :

$$V_\theta^* = \frac{1}{1+\rho}\left[u^* + V_{\theta-1}^*\right] = u^* \frac{1-(1+\rho)^{-\theta}}{\rho} + (1+\rho)^{-\theta} V_0^*.$$

As argued above, the foreign country's payoff under the null contract is trivial $V_0^* = 0$ (regardless of the state $s = G, M, B$). Hence the foreign country's payoff under the contract with tariffs τ, τ^* and the duration θ is

$$V_\theta^* = u^* \frac{1-(1+\rho)^{-\theta}}{\rho} \tag{3}$$

The minimum duration $\overline{\theta}$ that provides the incentive to invest given should solve $V_{\overline{\theta}}^* = c$.

Proposition 1 *The minimum duration of the fixed-term contract which provides a sufficient incentive for investment is*

$$\overline{\theta} = \frac{\ln\left(\frac{u^*}{u^*-c\rho}\right)}{\ln(1+\rho)}.$$

One period into the lifetime of the fixed-term agreement with the duration $\overline{\theta}$ (and tariffs τ, τ^*), this agreement no longer provides sufficient incentives to invest $V_{\overline{\theta}-1}^* < V_{\overline{\theta}}^* = c$.

Under this trade agreement, the foreign country is happy with its terms and wants to continue with the same tariffs even if the state is B and trade on the same terms is jointly inefficient. Therefore, once the state is B, the home country will immediately ask for renegotiation and will compensate the foreign country for scrapping the agreement.

4.3 Evergreen agreement

Now consider a contract that provides an ongoing protection for investment with a requirement that the unilateral withdrawal from the treaty has to be preceded by a notification of the other party α periods in advance of the withdrawal.[11] Thus, the contract stipulates that the parties trade under the tariffs τ, τ^* indefinitely; the home country has the right to terminate the agreement at time t by sending the foreign country a written notice at time $t - \alpha$.

As long as the state is G, there is no need to renegotiate; renegotiation would be a zero-sum game. Therefore, until the state is B, the parties continue to trade under the terms of the contract. Once state B arrives, the contract is renegotiated. If the state is M and there is no new investment opportunity, there is also no need to renegotiate. But if an investment opportunity arrives in state M, the parties do need to renegotiate; otherwise the foreign country would invest which would be jointly inefficient. Therefore, the home country offers to terminate the trade agreement and pays the compensation equivalent to the foreign

[11] An alternative setting is the evergreen contract with a unilateral escape clause (like in Bagwell and Staiger, 2005). The analysis would be similar but more cumbersome. Therefore we focus on the advance termination notice.

country's payoff from another α periods worth of trade under the terms of the agreement (therefore the foreign country obtains V_α^* as defined by (3)).

Now consider the foreign country's investment decision under the evergreen contract. Suppose that the investment opportunity arrives. The foreign country's returns to investment are as follows. First, u^* for each period until the state B (with $\gamma = \gamma^P$) arrives. Second, a payment equivalent to the payoff from α periods of continued trade under the terms of the agreement — after this state has arrived. Third, the payments equivalent to the outside option (i.e., the Nash outcome) after the good state returns. The latter effect is trivial as the home country has all the bargaining power and would capture the entire surplus from the resuming high level of trade.

Therefore the foreign country's returns to investment $V_{\alpha,s}^*$, $s = G, M, B$ are as follows:

$$\begin{aligned} V_{\alpha,G}^* &= \frac{1}{1+\rho}\left[u^* + (1-\lambda)V_{\alpha,G}^* + \lambda V_{\alpha,M}^*\right] \\ V_{\alpha,M}^* &= \frac{1}{1+\rho}\left[u^* + (1-\sigma)(1-\mu_B-\mu_G)V_{\alpha,M}^* + (1-\sigma)\mu_G V_{\alpha,G}^* + (\sigma+(1-\sigma)\mu_B)\,V_\alpha^*\right] \\ V_{\alpha,B}^* &= V_\alpha^* \end{aligned}$$

where V_α^* is the return to investment under a fixed term contract of length α, and u^* is the foreign country's one period return to investment given that trade takes place under the contracted tariffs τ, τ^*. In state B, it is jointly efficient to terminate the contract. In order for the foreign country to agree to the immediate termination, the home country has to compensate the foreign country with a one-time payment V_α^* for the foregone α periods worth of returns of investment under the trade agreement. In state G, the foreign country will receive one-period worth of returns u^* and the expected returns for the next period ($V_{\alpha,G}^*$ with probability $1-\lambda$ and $V_{\alpha,M}^*$ with probability λ). In the intermediate state, M, the parties have to take into the account the need to renegotiate the contract in case there is an investment opportunity. If there is no investment opportunity (probability $1-\sigma$), the parties continue to trade under the present contract until the bad state arrives. If this happens (unconditional probability $(1-\sigma)\mu_B$), parties terminate the contract and the home country pays the foreign country a lump-sum payment V_α^*. If the investment opportunity arrives, the contract provides the foreign country with incentives to invest. On the other hand, if the investment opportunity does arrive in state M, seizing this opportunity is jointly inefficient. Hence, it is optimal to pay V_α^* to the foreign country and terminate the contract immediately.

The solution to the system above is as follows:

$$V_{\alpha,G}^* = \frac{u^*}{\rho}\frac{\rho+\lambda+\sigma+(\mu_B+\mu_G)(1-\sigma)+\left[1-(1+\rho)^{-\alpha}\right]\frac{\lambda}{\rho}\left(\sigma+\mu_G(1-\sigma)\right)}{\rho+\lambda+\sigma+(\mu_B+\mu_G)(1-\sigma)+\frac{\lambda}{\rho}\left(\left(\sigma+\mu_G(1-\sigma)\right)\right.}$$

where we used the expression for V_α^* from (3).

To find the minimum termination notice time $\overline{\alpha}$ which provides sufficient investment incentives, we need to solve $V_{\overline{\alpha},G}^* = c$.

Proposition 2 *The minimum advance termination notice time $\overline{\alpha}$ of the evergreen contract to provide in-*

centives for investment is[12]

$$\overline{\alpha} = \frac{\ln\left(\frac{u^*}{u^*-c\rho}\left[1+\rho\frac{\rho+\lambda+\sigma+(\mu_B+\mu_G)(1-\sigma)}{\lambda(\sigma+\mu_G(1-\sigma))}\right]^{-1}\right)}{\ln(1+\rho)} = \overline{\theta} - \frac{\ln\left(1+\rho\frac{\rho+\lambda+\sigma+(\mu_B+\mu_G)(1-\sigma)}{\lambda(\sigma+\mu_G(1-\sigma))}\right)}{\ln(1+\rho)}.$$

4.4 The optimal contract

Let us now calculate the expected renegotiation costs under each contract. Suppose that the parties sign the fixed-term contract (in the good state given an investment opportunity). Once it is signed, it provides sufficient incentives to invest in the first period of the contract's duration. In the subsequent periods, four contingencies can arise. First, another investment opportunity may arrive, then the parties need to sign a new fixed-term contract. Second, the state M can arrive; no renegotiation is needed since the remaining duration of the existing fixed-term contract is insufficient to provide incentives for investment. Hence, the foreign country will not invest. Third, the bad state may eventually arrive. Then the parties renegotiate. Fourth, the state may remain good but no investment opportunity arrives; there is no need for renegotiation.

Now, let us consider the evergreen contract. Here the situation is different. If an investment opportunity does arrive in state G, there is no need for renegotiation. But if an investment opportunity arrives in state M, then the parties renegotiate to rule out the investment; they replace the evergreen contract with a null contract. The same happens if state B arrives.

We can now compare the expected renegotiation costs under the fixed term contract and under the evergreen contract.

Proposition 3 *In the case of homogenous good, the parties will choose the fixed-term contract whenever the risk of investment in the intermediate state is sufficiently high (i.e., λ and σ are sufficiently high, and/or μ_G is sufficiently low).*

The Proof is relegated to Appendix A.

Proposition (3) is quite intuitive. As discussed above, the benefit of the fixed-term contract is to prevent the suboptimal over-investment. Therefore, the fixed-term contract is preferred when the intermediate state is more likely (λ is high relative to $\mu_{G,B}$) and investment opportunity is more likely to arrive (high σ). By contrast, the evergreen contract works well if the state G is more likely; in this case, the evergreen contract continues to provide incentives for (optimal) investment. Therefore the evergreen contract is chosen whenever the good state is more likely (high μ_G). We were unable to obtain unambiguous comparative statics with regard to μ_B as the arrival of state B results in renegotiation under both types of contracts.

To understand the economics of the Proposition, consider the case of trade in commodities that requires a lumpy infrastructure investment. To provide incentives for this investment, parties sign a long-term agreement; but what should the agreement's structure be? This depends on the political and economic

[12] See Guriev and Kvasov (2005) for a detailed intuition for why the optimal advance notice $\overline{\alpha}$ is shorter than the optimal duration of the fixed-term contract $\overline{\theta}$.

environment. Suppose that the parties expect that the current pro-trade stance in the home country can easily change in the future. Then it is wiser to sign a fixed-term agreement which provides strong incentives today but weaker incentives in the future; hence the agreement will discourage the suboptimal overinvestment tomorrow. If, on the other hand, the current pro-trade political equilibrium is likely to stay, then the evergreen contract is better. Indeed, it will provide equally strong incentives today and tomorrow, hence no need to renegotiate tomorrow.

Remark 1 *In the analysis above, we considered trade agreements with tariffs constant over time. It is easy to show that under non-trivial renegotiation costs, such agreements are strictly optimal, for example, instead of the fixed-term contract with constant tariffs, let us consider a longer-term agreement where there would be high tariffs in the beginning and Pareto-optimal tariffs in the end. The tariff levels can be chosen so that the agreement would also provide efficient incentives in the first period; also like the optimal fixed-term contract above, such a contract would also prevent overinvestment – one period into the life of the agreement, the parties do not have incentives to invest. However, the contracts with variable tariffs involve excessive renegotiation: if the economy is in the state G or M, the parties will always renegotiate tariffs to the Pareto optimal levels.*

4.5 Trade in differentiated goods

In the case of trade in differentiated goods, the analysis is straightforward. At each period, there are investment opportunities for $\sigma > 0$ varieties. The fixed-term contract should therefore be constantly renegotiated. Expected renegotiation costs are κ per period.

Under the evergreen contract, if the investment is not too costly, the parties are better off not renegotiating at all and just allowing all investment opportunities to be exploited. Assumption A1 above (2) implies that the parties are better off to allow investments whenever an investment opportunity arrives. Therefore in the case of differentiated goods, the parties prefer the evergreen contract.

Notice, that in our model the termination notice is never used. This is explained by the fact that we consider a continuum of differentiated good varieties, of which exactly $\overline{p}_B = \frac{\mu_B}{\lambda+\mu_G+\mu_B}$ are in state B; the probability of many more varieties being in the protectionist state is trivial. In reality, if there is a discrete set of goods and there is a positive (albeit small) probability that all (or very many) of them are in the state B; then the home country may sometimes use the advance notice to terminate the agreement.

4.6 Robustness

The model above makes a number of simplifying assumptions. The main results are robust to the choice of uncertainty and investment technology. E.g. if the state space were richer and investments were continuous rather than binary, the results would still hold. The fixed term agreement would still be chosen to provide incentives for a lumpy one-off investment once it is signed but not later. In the subsequent periods, the incentives would be weakened and the foreign country would underinvest. Vice versa, the evergreen agreement

would provide the same incentives to invest both at the moment of its inceptions and in the subsequent periods thus encouraging small and frequent investments. These results may also be generalized to the case where optimal level investment is not constant in time – as discussed in Guriev and Kvasov (2005), these may be incentivized via an evegreen agreement with an advanced notice period that changes over time.

We do not consider other properties of differentiated goods such as elasticities of substitution, market power, entry etc. – the only feature that matters for the model above is the fact that in the differentiated good case investments are small and frequent rather than one-off and lumpy. Our model assumes full inter-variety spillovers of investment in the differentiated good case. This is certainly an extreme assumption. Yet, our qualitative argument holds to the extent these spillovers are not trivial.

5 Concluding remarks

In this paper we argue that the duration and the time structure of trade agreements are driven by the nature of trade covered by the agreement and the trade-related investments that the agreements are supposed to provide incentives for. Whenever choosing the structure of the trade agreement, parties have to address the incentives-flexibility trade-off. If the agreement is set to expire too soon, it does not protect irreversible investment in trade-related infrastructure. If the agreement is meant to last a very long time, it reduces the flexibility of the trading parties to change the terms of trade if there is a change in preferences or other economic parameters. Essentially, as the trade agreement becomes inefficient, the parties have to renegotiate it. However, as renegotiation is costly, it is in the interest of both parties to choose a trade agreement that would minimize the expected renegotiation costs. We show that this trade-off is resolved through the use of two instruments: duration of the agreement (short-term vs. long-term) and the time structure (fixed-term agreement vs. evergreen agreement with an advance termination notice).

If the parties trade in a homogenous good, they need an agreement that protects incentives for lumpy irreversible investments. Therefore, the parties choose a fixed-term trade agreement. Once there is an opportunity for a new investment project, they conclude another fixed-term agreement etc. If the parties trade in differentiated goods, where the trade-facilitating investments small and frequent, there is a need for ongoing provision of incentives to invest. Therefore parties opt for an evergreen contract with a termination notice.

This prediction seems to be in line with available anecdotal evidence and with the evidence on all the trade agreements to which the U.S. is a party and which are currently in effect (at least those 98 agreements which can be clearly classified as either evergreen or fixed term). Trade agreements that cover trade in homogenous goods are normally fixed-term, while the agreements that concern trade in differentiated goods and services are mostly evergreen. Yet, further research is needed to test this prediction in a more systematic way.

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Appendix A: Proofs

Proof of Proposition 3.

Denote R_s^{FT} the expected renegotiation costs under the fixed-term given the state is s, and r_s the expected renegotiation costs if there is no contract. Then

$$\begin{aligned}
R_G^{FT} &= \frac{1}{1+\rho}\left[\sigma(1-\lambda)(\kappa+R_G^{FT})+(1-\sigma)(1-\lambda)R_G^{FT}+\lambda R_M^{FT}\right] \\
R_M^{FT} &= \frac{1}{1+\rho}\left[(1-\mu_G-\mu_B)R_M^{FT}+\mu_G R_G^{FT}+\mu_B R_B^{FT}\right] \\
R_B^{FT} &= \frac{1}{1+\rho}\left[\kappa+(1-\lambda)r_B+\lambda r_M\right] \\
r_G &= \frac{1}{1+\rho}\left[\sigma(1-\lambda)(\kappa+\min\{R_G^{FT},R_G^{EG}\})+(1-\sigma)(1-\lambda)r_G+\lambda r_M\right] \\
r_M &= \frac{1}{1+\rho}\left[(1-\mu_G-\mu_B)r_M+\mu_G r_G+\mu_B r_B\right] \\
r_B &= \frac{1}{1+\rho}\left[(1-\lambda)r_B+\lambda r_M\right]
\end{aligned}$$

Now consider the evergreen contract. Here the situation is different. If an investment opportunity does arrive in the state G, there is no need for renegotiation. But an investment opportunity arrives in state M, then the parties need to renegotiate to rule out the investment. Also, renegotiation happens once the state B has arrived.

$$\begin{aligned}
R_G^{EG} &= \frac{1}{1+\rho}\left[(1-\lambda)R_G^{EG}+\lambda R_M^{EG}\right] \\
R_M^{EG} &= \frac{\sigma}{1+\rho}\left[\kappa+(1-\mu_G-\mu_B)r_M+\mu_G r_G+\mu_B r_B\right]+ \\
&\quad +\frac{1-\sigma}{1+\rho}\left[(1-\mu_G-\mu_B)R_M^{EG}+\mu_G R_G^{EG}+\mu_B R_B^{EG}\right] \\
R_B^{EG} &= \frac{1}{1+\rho}\left[\kappa+(1-\lambda)r_B+\lambda r_M\right]
\end{aligned}$$

Let us solve for $\delta_s = R_s^{EG} - r_s$ and $\Delta_s = R_s^{FT} - R_s^{EG}$. In the end of the day we are interested in the parameter constellation that imply $\Delta_G < 0$. Let also us introduce $\overline{\delta} = (1-\mu_G-\mu_B)\delta_M + \mu_G\delta_G + \mu_B\delta_B$.

We can see right away that $\Delta_B = 0$ and $\delta_B = \frac{\kappa}{1+\rho}$. Now let's write the equations for the remaining δ_s and Δ_s

$$\begin{aligned}
\Delta_G &= \frac{1}{1+\rho}\left[\sigma(1-\lambda)\kappa+(1-\lambda)\Delta_G+\lambda\Delta_M\right] \\
\Delta_M &= \frac{1}{1+\rho}\left[(1-\mu_G-\mu_B)\Delta_M+\mu_G\Delta_G-\sigma\kappa+\sigma\overline{\delta}\right] \\
\delta_G &= \frac{1}{1+\rho}\left[(1-\lambda)(1-\sigma)\delta_G+\lambda\delta_M-\sigma(1-\lambda)\kappa-\sigma(1-\lambda)\min\{\Delta_G,0\}\right] \\
\delta_M &= \frac{1}{1+\rho}\left[\overline{\delta}(1-\sigma)+\sigma\kappa\right]
\end{aligned}$$

The first two equations imply

$$\Delta_G = \sigma \frac{\kappa((1-\lambda)(\rho+\mu_G+\mu_B)-\lambda)+\lambda\overline{\delta}}{\rho(\rho+\lambda+\mu_G+\mu_B)+\lambda\mu_B} \tag{4}$$

$$\begin{aligned}
\left[\rho+\sigma+\lambda(1-\sigma)\right]\delta_G &= \lambda\frac{1}{1+\rho}\left[\overline{\delta}(1-\sigma)+\sigma\kappa\right]-\sigma\left(1-\lambda\right)\kappa-\sigma\left(1-\lambda\right)\min\{\Delta_G,0\} \\
\delta_G &= \frac{\overline{\delta}-\left(1-\mu_G-\mu_B\right)\frac{1}{1+\rho}\left[\overline{\delta}(1-\sigma)+\sigma\kappa\right]-\mu_B\frac{\kappa}{1+\rho}}{\mu_G} = \\
&= \frac{\left[\rho+\sigma+(\mu_G+\mu_B)(1-\sigma)\right]\overline{\delta}-\sigma\kappa\left(1-\mu_G-\mu_B\right)-\mu_B\kappa}{\left(1+\rho\right)\mu_G}
\end{aligned}$$

Therefore

$$\begin{aligned}
&\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\left[\rho+\sigma+(\mu_G+\mu_B)(1-\sigma)\right]\overline{\delta}-\sigma\kappa\left(1-\mu_G-\mu_B\right)-\mu_B\kappa\right] \\
= \;& \lambda\mu_G\overline{\delta}(1-\sigma)+\lambda\mu_G\sigma\kappa-\sigma\left(1-\lambda\right)\kappa\left(1+\rho\right)\mu_G-\sigma\left(1-\lambda\right)\left(1+\rho\right)\mu_G\min\{\Delta_G,0\}
\end{aligned}$$

When is the fixed-term contract preferred? Consider the case $\Delta_G < 0$. Then

$$\begin{aligned}
&\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\left[\rho+\sigma+(\mu_G+\mu_B)(1-\sigma)\right]\overline{\delta}-\sigma\kappa\left(1-\mu_G-\mu_B\right)-\mu_B\kappa\right] \\
= \;& \lambda\mu_G\overline{\delta}(1-\sigma)+\lambda\mu_G\sigma\kappa-\sigma\left(1-\lambda\right)\kappa\left(1+\rho\right)\mu_G-\sigma\left(1-\lambda\right)\left(1+\rho\right)\mu_G\Delta_G
\end{aligned}$$

$$\begin{aligned}
&\overline{\delta}\left(\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\rho+\sigma+(\mu_G+\mu_B)(1-\sigma)\right]-\lambda\mu_G(1-\sigma)\right) \\
= \;& \kappa\left(\lambda\mu_G\sigma-\sigma\left(1-\lambda\right)\left(1+\rho\right)\mu_G+\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\sigma\left(1-\mu_G-\mu_B\right)+\mu_B\right]\right) \\
& -\sigma\left(1-\lambda\right)\left(1+\rho\right)\mu_G\Delta_G
\end{aligned}$$

We need to substitute $\overline{\delta}$ from (4), find Δ_G and check that $\Delta_G < 0$. This holds if and only if

$$\begin{aligned}
0 \;>\; & \lambda\mu_G\sigma\left[\lambda-\left(1-\lambda\right)\left(1+\rho\right)\right]+\lambda\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\sigma\left(1-\mu_G-\mu_B\right)+\mu_B\right]+ \\
& \sigma\left[\left(1-\lambda\right)\left(\rho+\sigma+\mu_G+\mu_B\right)-\lambda\right]\left[\left[\rho+\sigma+\lambda(1-\sigma)\right]\left[\rho+\sigma+(\mu_G+\mu_B)(1-\sigma)\right]-\lambda\mu_G(1-\sigma)\right]
\end{aligned}$$

It is easy to show that (i) this is never the case if $\lambda \to 0$ and/or $\sigma \to 0$ (ii) this is the case if $\lambda \to 1$, $\sigma \to 1$.

Q.E.D.

Appendix B: Empirical analysis of fixed-term vs. evergreen agreements.

In order to make the factors affecting the duration and terms structure of trade agreements more concrete, we now provide a simple empirical evidence for our theoretical model. We would like to stress that given the limitations of the data and the limited nature of the statistical tests presented below, the following analysis perhaps should be seen more as an empirical illustration rather than a rigorous test of the theory outlined in this paper.

In keeping with the results of our model, we hypothesize that those trade agreements, which cover trade in more commoditized goods, are less likely to be evergreen. We test this hypothesis using a data set of 178 bilateral and plurilateral trade agreements to which the US is currently a party. The texts of all of these agreements are available at the website of the US Trade Compliance Center (TCC).[1] The benefit of using the TCC's data set is that (i) it provides a comprehensive list of all agreements currently effective in the US, and (ii) all TCC agreements are comparable as they share at least one common party, the United States.[2]

Since we are interested only in those trade agreements that have direct bearing on the terms of trade, we have excluded from the TCC's data set all the agreements that are not explicitly related to trade in goods or services (e.g., agreements on investment measures). We have also omitted the agreements which we have not been able to classify as either fixed-term or evergreen. As a result, we ended up with the sample consisting of 98 agreements, of which 30 are fixed-term and 68 are evergreen.

Among the 98 agreements in the data set, we have identified 42 agreements, which cover goods or services trade which cannot be classified as trade in commodities. We classified the remaining 56 trade agreements, which are either comprehensive or dedicated to specific commodities, as commodity-related.

[1] See tcc.export.gov

[2] Another potential source of data for our empirical analysis is the WTO data set of regional trade agreements (RTAs) notified by the countries to the GATT/WTO either under GATT Article XXIV or GATS Article V or the Enabling Clause of the Tokyo Round Agreement which permits preferential arrangements among developing countries in goods trade. However, many sector-specific bilateral agreements between the WTO member countries are not notified to the WTO because they are considered to be side-agreements to the RTAs which are supposed to cover "substantially all" trade. The problem is that the RTAs and their side-agreements often have entirely different final clause provisions regarding treaty duration and termination. For example, while the CUFTA is an evergreen agreement, the Canada-U.S. Softwood Lumber Agreement is a fixed term agreement concluded for 5 years. Also, the WTO data set does include asymmetric market opening agreements in which one country (or a group of countries) lowers barriers for products from certain other countries (e.g., the Lome convention agreements between the EU and former colonies). The absence of such sector-specific side-agreements and asymmetric agreements in the WTO data set makes it unsuitable for our empirical investigation.

The details of this classification are provided in Table 4 below, where the variable *Trade in Commodities* is 0 if the trade agreement is not related to commodities and 1 otherwise.

We employed a number of explanatory variables which may potentially influence the duration and term structure of trade agreements. Since, according to our theory, the optimal type of the agreement depends on the parameters representing the volatility of the political economy environment, we chose to control for the type of political institutions, which may influence the stability. We used variable DEMOC from Polity IV data set to construct variable *Level of democracy* which captures the stability of political institutions. In addition, we employed two variables, *Log GDP per capita of trade partners* and *Log GDP per capita of trade partners relative to US* to control for the level of economic development of the US trade agreement partners. In constructing these variables we used the World Development Indicators to calculate the GDP per capita for the US agreements' partner countries. For the plurilateral agreements, we calculated the weighted average GDP per capita for the agreements' member countries (other than the U.S.) weighted by their population shares.

The dependent variable we seek to explain in our analyses is *Fixed Term*, which is 1 if the final clause of the agreement specifies that it is concluded for a finite period of time and not supposed to be renewed unless parties renegotiate the renewal. It is 0 if the agreement is supposed to remain valid indefinitely unless a party decides to withdraw and gives an advance notice about this to the other parties. Of the 98 agreements in our data set, 30 were of fixed duration (coded 1). The main characteristics of fixed-term and evergreen agreements are compared in Table 1 in the Introduction. Tables B1 and B2 in the end of this Appendix present the summary statistics and the pairwise correlations for all the variables. The data suggests that fixed-term agreements are more likely to cover trade in commodities and to be concluded with less developed and less democratic countries; the differences are significant.

These effects hold in the multivariate regressions as well. As the Table B3 below shows, fixed-term agreements, to which the U.S. is a party, are indeed more likely to be associated with trade in commodities even when we control for the level of economic development in the U.S. trade-partner countries. This result holds when the level of development is represented by the per capita GDP of trade partners as well as their per capita GDP relative to that of the U.S. level. We also find that the degree of democracy turns out to be insignificant once we control for the level of development.

Next, in order to perform a robustness check, we excluded all the agreements, which, in our reading, were concluded mainly to protect access of the US exporters to the foreign markets, and the intellectual property rights agreements (which are also more likely to benefit the U.S. exporters of goods and services). We ended up with the reduced sample of 54 agreements. In this sample, the fixed term agreements are also more likely to be associated with trade in commodities. While 75% of the evergreen agreements are related to trade in commodities, the share of agreements covering commodities among the

fixed-term agreements is 95%. In fact, there is only 1 fixed-term agreement in the reduced sample which is dedicated to trade which cannot be categorized as commodity trade.

We run the same regressions for the reduced sample (Table B3) and find similar results. Only in the last specification, the coefficient of the *Trade in Commodities* dummy is not significant which may be explained by the small sample size.

In order to perform yet another robustness check, we excluded all the agreements between the U.S. and other developed countries (i.e., the OECD countries). While some of these agreements may contain provisions relevant for trade in commodities, the actual share of this kind of trade is relatively small in overall trade between the U.S. and other developed countries if compared with its share in trade between the U.S. and non-OECD countries. After omitting these agreements, the sample is reduced to 54 agreements, 27 of which are fixed term agreements and 27 are evergreen agreements. Among the 27 fixed term agreements, 22 cover trade in commodities (81%); out of the 27 evergreen agreements, only 16 agreements cover trade in commodities (59%). The difference is statistically significant. The results of the probit regressions for this sample are presented in the last three columns of Table B3. The coefficient of the commodity trade dummy remains large and significant.

Overall, consistent with our theoretical argument, we find that both pair-wise and controlling for the level of economic development and democracy, the fixed-term agreements are more likely to be associated with trade in commodities, rather than in non-commoditized goods and services. The effect is economically significant: the share of fixed term agreements among commodities vs. non-commoditized goods differs by 20-30 percentage points.

Again, we warn that although the presented empirical evidence provides support for our theory, our analysis of the current trade agreements between the U.S. and other countries is meant to serve as an illustration of our theory rather than as an indepth empirical study of the trade agreements' duration. Such a study would require a more detailed data base including the trade agreements to which the U.S. is not a party.

Table B1. Summary statistics.

Variable	Observations	Mean	Std.dev.	Min	Max
Fixed term dummy	98	0.31	0.46	0.00	1.00
Dummy: covers trade in commodities	98	0.57	0.50	0.00	1.00
Log (GDP per capita of trade partners relative to US) ♣	98	-1.77	1.57	-4.83	0.21
Log (GDP per capita of trade partners in 2000 US dollars)♣	98	8.51	1.59	5.21	10.5
Level of democracy♣	98	6.77	3.61	0.00	10.0

Table B2. Pairwise correlations (all correlations are significant at 1% level)

Fixed term dummy	1.00				
Covers trade in commodities	0.26	1.00			
Log (GDP per capita of trade partners relative to US) ♣	-0.43	-0.26	1.00		
Log (GDP per capita of trade partners in 2000 US dollars)♣	-0.48	-0.26	0.99	1.00	
Level of democracy♣	-0.33	-0.27	0.75	0.75	1.00

Table B3. Probit regressions for the fixed-term dummy (marginal effects reported).

Dependent variable	Dummy for fixed term agreements								
Sample	Full sample			Reduced sample			Non-OECD partners		
Covers trade in commodities	0.17	0.17	0.17	0.36	0.29	0.26	0.27	0.27	0.28
	(0.09)*	(0.09)*	(0.09)*	(0.13)***	(0.17)*	(0.19)	(0.14)*	(0.14)*	(0.14)**
Log (GDP per capita of trade partners relative to US) ♣	-0.12	-0.13			-0.10		-0.08	-0.08	
	(0.03)***	(0.05)***			(0.07)		(0.06)	(0.07)	
Log (GDP per capita of trade partners in 2000 US dollars)♣			-0.16			-0.18			-0.13
			(0.05)***			(0.07)***			(0.07)*
Level of democracy♣		0.00	0.01		-0.01	-0.01		0	0.01
		(0.02)	(0.02)		(0.03)	(0.03)		(0.02)	(0.02)
Observations	98	98	98	54	54	54	54	54	54
Pseudo R-squared	0.19	0.19	0.22	0.06	0.14	0.19	0.06	0.06	0.09

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
♣ population-weighted-averaged across trade partners at the time of signing

Table B4. Classification of US trade agreements.

Agreement	Year signed	Fixed term	Trade in commodities	GDP pc relative to US
APEC Telecommunications MRA	1998	0	0	11.8%
Bulgaria Agreement On Trade Relations	1991	1	1	5.7%
Canada Magazines Agreement	1999	0	0	65.9%
European Union Agreement On Trade In Large Civil Aircraft	1992	0	0	62.9%
India Motion Pictures Agreement	1992	0	0	1.1%
Indonesia Conditions For Market Access For Films And Videos	1992	0	0	2.4%
Israel Free Trade Agreement	1985	0	1	51.2%
Japan Agreement Clarifying The Framework Agreement	1994	0	1	117.8%
Japan Computer Products And Services Agreement	1992	0	0	121.8%
Japan Distilled Spirits Agreement	1997	0	1	115.2%
Japan Enhanced Initiative on Deregulation and Competition Policy	1997	0	0	115.2%
Japan Foreign Lawyers Agreement	1987	0	0	107.4%
Japan Framework Agreement	1993	0	1	120.1%
Japan Grademarked Lumber Agreement	1997	0	1	115.2%
Japan Major Projects Arrangement	1991	1	0	123.2%
Japan Ports And Harbor Practices Agreement	1997	0	0	115.2%
Japan Public Sector Procurement Of Telecommunications Products And Services Agreement	1994	0	0	117.8%
Japan Public Works Agreement (1994)	1994	0	0	117.8%
Japan Report On Medical Equipment And Pharmaceuticals Market-Oriented, Sector-Selective (MOSS) Discussions	1986	0	0	106.5%
Japan Satellite Procurement Agreement	1990	0	0	117.8%
Kazakhstan Trade Relations Agreement	1993	1	1	4.3%
Korea Understanding On Telecommunications--2/17/92	1992	0	0	26.5%
North American Free Trade Agreement	1994	0	1	29.7%
Romania Agreement On Trade Relations	1992	1	1	5.4%
Russia Memorandum of Understanding On Aircraft Market Access	1996	0	0	5.1%
Russia Trade Relations Agreement And Annexes Concerning Settlement Of Lend-Lease Accounts And Status Of Commercial Office In Moscow	1992	1	1	7.4%
Semiconductors Joint Statement	1999	1	0	68.7%
Ukraine Trade Relations Agreement	1992	1	1	4.0%
Agreement on Mutual Acceptance of Oenological Practices	2001	0	0	32.1%
Albania Trade Relations Agreement	1992	1	1	2.3%
Australia Free Trade Agreement	2004	0	1	62.2%
Australia Understanding on Automotive Leather Subsidies	2000	0	1	60.3%
Bahrain Free Trade Agreement	2004	0	1	1.1%
Belarus Memorandum of Understanding on Textiles	2004	1	1	4.7%
Belarus Memorandum of Understanding on Textiles	2002	1	1	4.1%
Belarus Memorandum of Understanding on Textiles	2003	1	1	4.3%
Belgium Friendship, Establishment and Navigation Treaty	1963	1	1	56.9%
European Union Mutual Recognition Agreement on Marine Equipment	2003	0	0	60.6%
Cambodia Trade Relations & Intellectual Property Rights Agreement	1996	1	0	0.8%
Canada Agreement On Beer Market Access In Quebec And British Columbia	1994	0	0	65.9%
Canada Agreement Regarding Tires	1993	0	0	65.3%
Canada Memorandum Of Understanding On Provincial Beer Marketing Practices	1992	0	0	65.4%
Canada Termination Of Bell Canada/Northern Telecom Preferred Supplier Relationship Agreement	1994	0	0	65.9%
Central American/Dominican Republic Free Trade Agreement	2004	0	1	5.4%
Chile Free Trade Agreement	2003	0	1	14.7%
Chile Memorandum Of Understanding On Aquatic Health Systems	2001	0	1	14.5%
Denmark Friendship, Commerce, and Navigation Treaty	1961	1	1	91.7%
European Union Distilled Spirits And Spirit Drinks Agreement	1994	0	1	58.3%
European Union Mutual Recognition Agreement	1997	0	1	60.2%
European Union Pasta Agreement	1987	0	0	59.6%
European Union Understanding on Bananas	2001	0	1	61.4%
Hungary Intellectual Property Rights Agreement	1993	1	1	12.3%

Jamaica Intellectual Property Rights Agreement	1994	1	0	10.8%
Japan--Tokyo Declaration On Global Partnership With The US	1992	0	1	121.8%
Japan Cellular Telephone And Third Party Radio Agreement (1989)	1989	0	0	113.1%
Japan Economic Partnership	2001	0	1	106.5%
Japan International Value-Added Network Services Agreement	1990	0	0	117.8%
Japan International Value-Added Network Services Agreement (#2 Of 2)	1991	0	0	123.2%
Japan Mutual Understanding On Patents	1995	0	1	118.0%
Japan Supercomputer Procurement Agreement	1990	0	0	117.8%
Japan Wood Products Agreement	1990	0	1	117.8%
Jordan Free Trade Agreement	2000	0	1	5.0%
Korea Intellectual Property Rights & Insurance Understandings	1986	0	0	18.6%
Korea Market Access For Wine And Wine Products Agreement	1989	0	0	21.8%
Korea Motion Pictures Importation And Distribution Agreement	1988	0	0	21.2%
Korea Revised Cigarette Agreement	1995	0	0	30.6%
Latvia Trade Relations And IPR Agreement	1994	1	1	8.0%
Madagascar Navigation and Commerce Treaty	1960	1	1	2.8%
Mexico Fresh Tomatoes Antidumping Investigation Suspension Agreement	2002	0	1	16.9%
Mexico Measures Affecting Telecommunications Services	2004	0	0	16.6%
Mexico Tires Certification Agreement	1996	0	1	16.5%
Morocco Free Trade Agreement	2004	0	1	3.7%
Nicaragua Intellectual Property Rights Agreement	1998	1	0	2.3%
North American Free Trade Side Agreement On Environmental Cooperation	1993	0	1	29.7%
Oman Amity, Economic Relations And Consular Rights Treaty	1960	1	1	6.7%
Pakistan Friendship and Commerce Treaty	1961	1	1	1.3%
People's Republic Of China Trade Relations Agreement	1979	1	1	0.8%
Russia Agreement On Firearms And Ammunition	1996	0	0	5.1%
Russia Ammonium Nitrate Antidumping Investigation Suspension Agreement	2000	0	1	5.1%
Russia Bilateral Textile Agreement	1997	0	1	5.0%
Russia Cut-to-Length Carbon Steel Plate Antidumping Investigation Suspension Agreement	2003	0	1	6.0%
Russia Hot-Rolled Flat-Rolled Carbon-Quality Steel Products Antidumping Investigation Suspension Agreement	1999	0	1	4.8%
Russia Uranium Antidumping Investigation Suspension Agreement	1993	0	1	5.2%
Russia Visa Arrangement Concerning Textiles And Textile Products	1996	0	1	5.1%
Singapore Free Trade Agreement	2004	0	1	68.2%
Sri Lanka Intellectual Property Rights Agreement	1991	1	0	2.1%
Thailand Cigarettes Agreement	1990	0	0	5.1%
Togo Amity and Economic Relations Treaty	1967	1	1	1.6%
Trinidad And Tobago Intellectual Property Rights Agreement	1994	1	0	16.7%
Turkey Foreign Film Revenues WTO Settlement	1997	0	0	9.3%
Ukraine Bilateral Textile Agreement	2001	1	1	2.0%
Ukraine Cut-to-Length Carbon Steel Plate Antidumping Investigation Suspension Agreement	1997	0	1	1.9%
Ukraine Visa Arrangement Concerning Textiles And Textile Articles	1997	0	1	1.9%
Vietnam Bilateral Trade Agreement	2000	1	1	1.1%
Vietnam Establishment Of Copyright Relations Agreement	1997	0	0	1.1%
Macedonia (Former Yugoslav Republic Of) Commercial Relations Treaty	1991	1	1	6.9%
Slovenia Commercial Relations Treaty	1991	1	1	26.3%
Croatia Commercial Relations Treaty	1991	1	1	13.5%