North-South Customs Unions and International Capital Mobility

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Abstract:

We examine the implications of a North-South trade accord where investments in the Southern partner nation exhibit country risk. Our analysis demonstrates that North-South trade accords can serve as credibility-enhancing mechanisms that induce additional foreign capital inflows into Southern partner nations. We also demonstrate that the presence of sovereign risk changes the tradeoffs between trade creation and diversion, enhancing the potential for regional trade accords to increase the welfare of accord members. However, sovereign risk also introduces a novel channel through which non-partner Southern nations can have their welfare reduced by regional trade accords.

I. Introduction

The recent debate concerning the North American Free Trade Agreement (NAFTA) in both policy circles and the popular press suggested that the primary impact of the regional trade accord would not be a small reduction in already low tariffs among the NAFTA partners, but a fundamental change in the attractiveness of Mexico as a location for investment, resulhng in large capital movements between the Northern and Southern trading partners. This claim was popularized by such opponents of NAFTA as Ross Perot, who claimed that NAFTA would create a "large sucking sound" as capital flowed from North to South in response to the trade accord. Indeed, there is some evidence that "financial diversion" has taken place in response to North-South integration, in the case of both Portugal and Spain in the EEC and Mexico under NAFTA (Primo Braga, 1993).

Despite the consensus among policymakers that the impact of trade accords on capital movements is potentially important, this issue seems to have received little attention in the professional literature on the welfare implications of customs unions,1 which has centered on the tradeoff between trade creation and trade diversion.2 We should note that this is true even of more recent analyses of trade accords, which stress both strategic issues (McLaren, 1993, Bagwell and Staiger, 1993) and the political-economic implications of such accords (Grossman and Helpman, 1993). The reason for this gap in the literature is probably historical. Prior to NAFTA, successful regional trade areas tended to be between Northern countries, as in the EEC and the US-Canada free trade area. As the first major North-South free trade area, the NAFTA raises issues which are not central to North-North trade accords.

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1See Lipsey (1960) and de Melo et al. (1993) for extensive early and more recent surveys.

2Notable exceptions include Miyagiwa and Young (1986), who explicitly introduce factor mobility into their analysis of customs unions in a different context, and Manchester and McKibbin (1994), who analyze the implications of an ad hoc decrease in Mexico's risk premium as a result of the NAFTA accord.

The primary distinction in a North-South trade accord is likely to be that in the Southern nation physical capital is scarce relative to its Northern trade partner. Consequently, the impact of the trade accord on the ability of the Southern trading partner to attract capital may have welfare implications for both Northern and Southern nations. In this paper, we extend the traditional analysis of customs unions to allow for international capital movements. Our results indicate that trade accords may affect the ability of Southern nations to attract capital, and may divert capital among Southern nations. Moreover, the welfare implications of North-South trade accords may differ from the predict minor third-country impacts of NAFTA when factor endowments are held constant (Safadi and Yeats, 1993).

There is some anecdotal evidence that Southern nations already understand the potential of bilateral and multilateral treaties as a mechanism for achieving greater international credibility. Mexico has explicitly committed under the NAFTA accord to national treatment of foreign investments and has codified numerous investment regime liberalizations towards its NAFTA partners, even though it had already undergone a large reform program in 1989 (Hufbauer and Schott, 1992). Apparently, the reason for reconfirming these liberalizations under NAFTA was that tying Mexico's commitments to the trade accord provide an explicit mechanism for penalizing violations against NAFTA country investors. In fact, prior to the NAFTA accord, Hufbauer and Schott (1992) had predicted that "Since regulations are more easily changed than laws, the United States and Canada are likely to seek commitments from Mexico in the NAFTA to make regulatory reform more permanent." Along similar lines, Chile offered to unilaterally commit to some liberalizing policies under the Uruguay round of GATT.3

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3We thank Andres Velasco for providing this example.

The ability to use trade accords as credibility-enhancing mechanisms may therefore be an aspect of regional trade accords that is particularly important in North-South agreements.4

We introduce a model of a bilateral free trade accord between a Northern and a Southern nation in which the Southern nation utilizes capital from the North for production purposes. The model is one where the Southern nation faces a standard timing-inconsistency problem concerning levels of taxation on foreign investment. The Southern nation then commits to a given level of taxation of foreign investment under the trade accord. Without loss of generality, and following actual trade accords, we assume that such commitment takes the form of national treatment, that is, equal levels of taxation of all investments irrespective of nationality of the investor.5 The model considers the possibility of the Northern and Southern partner nations entering into a trade accord in which the Northern partner commits to allowing exports from the Southern partner to enter its nation tariff free, and the Southern partner commits to taxing foreign investment at the same rate as it taxes domestic investors. Violation of the accord by either member leads to a cessation of the accord, and to the Northern partner levying the optimal tariff on all imports.6

4Perroni and Whalley (1993) interpret the same liberalizations as concessions to larger entities in return for insurance against trade wars. These two interpretations do not necessarily conflict; if a mutually beneficial agreement requires these liberalization "concessions," a Southern trade partner may be unable to achieve the agreement in the absence of the greater commitment capacity the accord brings in the context of our analysis below.

5Under this assumption, the host countries do not discriminate among foreign investors by their nationalities of origin. In practice, efforts to so discriminate may be very costly or impossible.

6The impact of sovereign risk on long-term relationships between transnational corporations and their host nations has been examined by Thomas and Worrall (1994). Similar to the results below, they find that long-term gains for both parties from trade between a corooration and its host country a relationship to become self-enforcing and long-term.

In addition, we consider the implications of the accord for a third, non-partner Southern nation. This third nation also relies on foreign investment and faces a timing-inconsistency problem concerning the rate of taxation on foreign investment. One could interpret the third nation as representing the rest of the South, or exporting nations not included in the trade accord.

The model demonstrates that the standard analysis of trade-diverting trade accords must be adjusted to account for changes in the risk characteristics of the trading partners. In particular, our results demonstrate that the trade accord can be increase the capacity of the Southern partner to accommodate foreign investment under compliance with national treatment. This leads to increased capital inflows into the Southern nation, and increases its gains from the regional trade accord. However, this novel channel also impacts the non-partner Southern nation. In addition to the standard terms of trade decline that this nation suffers by being left out of the accord, it now experiences the added burden of an increased credibility problem.

The remainder of this paper is divided into six sections. Section 2 derives the optimal tariff charged by the Northern partner nation in the presence and absence of the trade accord. Section 3 then derives the capital constraints faced by Southern partner and non-partner nations due to their credibility problem. Section 4 derives the equilibrium output levels in the model. Section 5 then examines the net impact of the trade accord on output, prices, and welfare. Section 6 analyzes the case in which local tax rates are set to maximize foreign revenues. Section 7 concludes.

II. Optimal Tariff in the Northern Partner Nation and the World Price of Southern Exports

The model is a repeated game. There are two Southern nations. We distinguish values for the non-partner nation by hats. For example, each Southern nation has a domestic sector with exogenous output s and $\hat{s}$ for the Southern partner and non-partner nation, respectively. In addition, each has a foreign sector in which output is a function of the magnitude of foreign investment, K and $\hat{K}$. Let f and $\hat{f}$ represent the outputs of the foreign sectors, $f=f(K)$, $f'>0$, $f''<0$, and $\hat{f} =\hat{f}(\hat{K})$, $\hat{f}'>0$, $\hat{f}''\leq0$. Let x and $\hat{x}$ represent total output of the Southern nations, where $x=s+f$, and $\hat{x}=\hat{s}+\hat{f}$, all of which is exported to the North.

Each period has three stages. In the first stage, investors choose K and $\hat{K}$. In the second stage under the trade accord, the Northern partner nation chooses whether to comply with the terms of the trade accord. If it chooses compliance, it levies its optimal tariff τ on all nations other than the Southern partner nation, whose exports are allowed to enter tariff-free. If it chooses to violate the trade accord (or if no trade accord exists), it levies its optimal tariff on all nations. In the final stage, the Southern nations choose whether or not to comply with their pledge of national treatment.

Let z represent the imports of the Northern partner nation. The output and

imports of the rest of the world are taken as exogenous. Define ~ as the world price of the Southern exportable which satisfies:

$$\delta = \delta(x + \hat{x} - z) \quad (1)$$

where $\delta' < 0$, and $\delta'' \geq 0$.

We assume that total Northern partner demand exceeds the output of the Southern partner.[7] The Northern partner then imports the total output of the Southern partner, plus some additional amount from the rest of the world. Define P as the equilibrium price of the Southern export good under the trade accord, given that the Northern partner nation levies its optimal tariff T on non-partner nation exports. Define $D = D(z)$, $D' < 0$, $D'' \geq 0$, as the domestic price of the Southern exportable within the Northern partner nation. Let D now denote the corresponding equilibrium consumer price, inclusive of the tariff, to be enjoyed by the Southern partner nation under the trade accord. We show in the appendix that given the tariff decision by the Northern partner nation, P and D are functions of Southern production levels x and $\hat{x}$:

$$P = P(x,\hat{x}), \quad D = D(x,\hat{x}) \quad (2)$$

where $P' < 0$ and $D' < 0$ in both arguments and $|\partial P/\partial x| < |\partial P/\partial \hat{x}|$ and $|\partial D/\partial x| < |\partial D/\partial \hat{x}|$.

Let $\tilde{y}$ represent the value of any variable y in the absence of the trade accord. For example, define $\tilde{P}$ as the world price of the Southern export good given the optimal tariff by the Northern partner nation in the absence of the trade accord. We demonstrate in the appendix that in the absence of a trade accord, $\tilde{P}$ and $\tilde{D}$ are also doubles:

$$\tilde{P} = \tilde{P}(x,\hat{x}), \quad \tilde{D} = \tilde{D}(x,\hat{x}) \quad (3)$$

where $\tilde{P}_x = \tilde{P}_{\hat{x}} < 0$ and $\tilde{D}_x = \tilde{D}_{\hat{x}} < 0$.

We also demonstrate that given total Southern output $x+\hat{x}$, in the presence of the trade accord the Northern partner applies a lower optimal tariff τ, which results in larger imports z. This result reflects the fact that under the accord the Northern partner is already allowing goods from the Southern partner to enter tariff free, which lowers the net price effect of contracting imports, thus diluting its monopsony power.

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7The alternative is that the Northern partner nation imports only from the Southern partner nation under the accord--a rather trivial case.

III. Capital Constraints Faced by the Southern Partner and by Non-Partner Nations

In the absence of a trade accord, the decision concerning complying with national treatment of foreign investment faced by the Southern partner nation would be identical in nature to that faced by the Southern non-partner nation. However, the signing of the trade accord changes the nature of the Southern partner decision. In what follows, we first analyze the standard case faced non-partner nation and then focus on the novel case faced by the partner nation.

3.1 *Capital constraint faced by the non-partner nation*

We assume that the non-partner nation has made a pledge of national treatment towards foreign investment, which constitutes taxing foreign output at the same rate that domestic output is taxed, $\hat{t}$. We treat $\hat{t}$ as exogenous here, considering the extension to endogenous $\hat{t}$ below.

If the non-partner nation chooses noncompliance, it fully taxes the output of the foreign sector during this period. However, following Bulow and Rogoff (1989a), we assume that this nation suffers the penalty of losing a portion of the proceeds of its output $(1-\lambda)$ from that period onwards $(0 < \lambda < 1)$. Moreover, it receives no additional foreign capital inflows, so that its total output is $\hat{s}$. Let β represent one minus the non-partner nation's rate of discount. Let x^n and P^n represent, respectively, the output of the partner nation and the resulting world price level under noncompliance by the non-partner nation, and let $\hat{V}^n_t+1$ represent the value function of the non-partner nation under incompliance beginning in period t+1. $\hat{V}_t^n+1$ satisfies:

$$\hat{V}^n_t+1 = \lambda \hat{P}^* \hat{s}/(1-\beta). \quad (4)$$

Equation (4) is also valid in the absence of the trade accord with $\tilde{P}$ substituted for P. The non-partner nation's value function in period *t* when choosing noncompliance then satisfies:

$$\hat{V}^n_t = \hat{P}x + \beta\lambda \hat{P}^n \hat{s}/(1-\beta). \quad (5)$$

Under compliance, the non-partner nation enters the following period with the choice of either maintaining compliance or choosing noncompliance. Let $\hat{V}^c_t$ represent the value function under compliance in period *t*. $\hat{V}^c_t$ satisfies:

$$\hat{V}^c_t = \hat{P}(s + \hat{t}f) + \beta\max(\hat{V}^c_t+1' \hat{V}^n_t+1) \quad (6)$$

Notice that $\hat{K}_t$ is constrained by the risk of violation of national treatment in the sense that $\hat{V}^c_t-\hat{V}^n_t$ is decreasing in K_t. In equilibrium, investors choose $\hat{K}_t$ such that $\hat{V}^c_t \geq \hat{V}^n_t$ in every period. $\hat{V}^c_t$ then satisfies:

$$\hat{V}^c_t = \hat{P}(\hat{s} + t\hat{f})/(1-\beta) \quad (7)$$

Assuming that the condition $\hat{V}^c_t \geq \hat{V}^n_t$ is binding, by (5) and (7) K satisfies:

$$\hat{P}[\beta\hat{s} + (t+\beta-1)\hat{f}] - \beta\lambda\hat{P}^n_s = 0 \equiv \wedge \quad\quad (8)$$

Equation (8) places some parameter constraints on the possible values of the exogenous parameters. First, a sufficient but not necessary condition for a finite solution is $t+\beta<1$. Second, for K>0, we require that $\lambda<P/P^n$. Notice that this implies that $\lambda<1$, since if $\lambda=1$, then $P=P^n$ In other words, like in Bulow and Rogoff (1989b), direct penalties in the case of noncompliance are required to support foreign investment.

3.2. *Capital constraint faced by the partner nation*

We assume that the partner nation has also made a pledge of national treatment toward foreign investment, which corresponds to a pledge to tax foreign output at the same rate that domestic output is taxed, *t*. Again, we initially treat *t* as exogenous.

In the absence of a trade accord, the decision faced by the partner nation would be identical to that faced by the non-partner nation above. If the partner nation chooses noncompliance, it fully taxes the output of the foreign sector in the current period. However, beginning with the following period it suffers the penalty of losing a portion of the proceeds of its output $(I - \lambda)$, where $0 < \lambda < 1$, and receives no additional foreign capital inflows. In addition, if there is a trade accord, we assume that the accord is disrupted and that the Southern partner nation faces the Northern partner nation's optimal tariff.

This exacerbates the noncompliance penalty faced by the Southern partner nation. Under the accord, the Southern partner earns the Northern partner's domestic price D. Beginning one period after violating the trade accord, however, the Southern partner faces the Northern partner's optimal tariff. Let $\hat{\beta}$ represent one minus the Southern partner's rate of discount and let x^p and P^p represent, respectively, the output of the non-partner nation and the resulting world price level under noncompliance by the partner nation. Let $V^p_t +1$ represent the value function of the partner nation under noncompliance beginning in period *t*+1. V^p_t+1 satisfies:

$$V^p_t + 1 = \lambda\tilde{P}^p s/(1-\beta) \quad\quad (9)$$

The value function of the Southern partner nation in period t under noncompliance then satisfies:

$$V^p_t = Dx + \beta\lambda\tilde{P}^p s/(1-\beta). \quad\quad (10)$$

Under compliance, the partner nation enters the following period with the

choice of either maintaining compliance or choosing noncompliance. Its value function under compliance therefore satisfies:

$$V^c_t = D(s + tf) + \beta \max(V^c_t + 1, V^P_t + 1) \quad (11)$$

In equilibrium, investors will choose K such that $V^c \geq V^P$ in every period. V^c_t then satisfies:

$$V^c_t = D(s + tf)/(1-\beta) \quad (12)$$

Assuming that the constraint $V^c_t \geq V^P_t$ is binding, by (10) and (12) K satisfies:

$$D[\beta s - (1-\beta-t)f] - \beta s \lambda \tilde{P}^P = 0 \equiv \Lambda \quad (13)$$

As in the non-partner nation case, K_t is constrained by the risk of violation of national treatment, in the sense that $V^c_t - V^n_t$ is decreasing in K_t. The sufficient conditions for positive and finite K are similar to those for the non-partner nation. First, a sufficient but not necessary condition for a finite solution is $t+\beta<1$. Second, for a positive solution, we require $\lambda < D/\tilde{P}^P$. We again adopt both of these restrictions.

Note that unlike the rest of the South, the Southern partner can sustain positive foreign investment even in the absence of the direct penalties for noncompliance underlying the parameter λ. We demonstrate below that the trade accord leads to a price advantage to the Southern partner nation, which alone would support national treatment for some positive level of foreign investment.[8] The trade accord is an additional commitment mechanism which, to our knowledge, has not been analyzed in the literature.

IV. Equilibrium Output Levels

In this section, we derive the equilibrium levels of foreign capital inflows and output of the two Southern nations. As indicated above, while neither nation chooses noncompliance in equilibrium, the threat of noncompliance affects the capital constraint faced by the two nations. Consequently, we first find the output equilibria where one of the two nations is in noncompliance. We then find the overall equilibrium output levels.

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[8] The assumption that there are additional penalties for noncompliance ($\lambda<1$) is made to allow for positive foreign investment in the absence of the trade accord and in the rest of the South. The assumption not only adds realism, but also allows us to study the effect of the trade accord on foreign investment in the rest of the South.

4.1 *Equilibrium with the partner and non-partner nations in noncompliance*

Let $\hat{\wedge}^p$ represent the capital constraint faced by the non-partner nation when the partner nation is in noncompliance. When the partner nation is in noncompliance, K is constrained to equal 0, and P= $\tilde{P}^p$. By (8) $\hat{\wedge}^p$ satisfies:

$$\tilde{P}^p[\hat{\beta}\hat{s} + (\hat{t} + \hat{\beta}-1)\hat{f}] - \hat{\beta}\hat{\lambda}\tilde{P}^{np}\hat{s} = 0 \equiv \hat{\wedge}p \quad (14)$$

where P^{np} represents the price that emerges when both Southern nations are in noncompliance. $\hat{x}^p$ is then the value of $\hat{x}$ that satisfies (14). We solve for the comparative statics of the solution for $\hat{x}^p$ in the appendix, which satisfy: 9

$$\hat{x}_p = g(\hat{\beta}, \hat{t}, \hat{\lambda}) \quad (15)$$
$$\qquad\quad + \quad + \quad -$$

Let $\wedge^n$ represent the capital constraint faced by the partner nation when the partner nation is in noncompliance. Under the trade accord, when the non-partner nation is in noncompliance, $\hat{K}$ is constrained to equal 0, and P=P^n. Let D^n represent the domestic price within the Northern partner under noncompliance by the non-partner Southern nation. By (13) $\wedge^n$ satisfies:

$$D^n[\beta s - (1-\beta-t)f] - \beta s\lambda \tilde{P}^{np} = 0 \equiv \wedge^n \quad (16)$$

xn is then the value of x which satisfies (16). Under the assumption that $t+\beta<1$, we solve for the comparative statics of the solution for x^n in the appendix. The comparative static solutions satisfy $x^n = g(\beta,t,\lambda)$. (17)
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad + \quad + \quad -$$

4.2 *Equilibrium with both nations in compliance*

In this deterministic model, foreign investors limit capital inflows into both nations so as to ensure that countries choose to comply with national treatment ex-post. Equations (8) and (13) then form the equilibrium equations for our model. We solve for the comparative static solutions in the appendix.

The comparative static results reveal an ambiguity introduced by the indirect effect of the change in the value function under noncompliance of the non-partner Southern nation. For example, a decrease in λ implies that the penalty suffered under default by the partner nation is enhanced. Holding K constant, the direct effect of this decrease is a reduction in the value function of the Southern partner nation under compliance, and hence an increase in the magnitude of K that can be supported without inducing noncompliance.

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9 Since s and $\hat{s}$ also enter into the determination of the world price, the comparative static results for these parameters are ambiguous.k

However, by (17) a decrease in λ also implies an increase in x^n, the output of the Southern partner nation given noncompliance by the non-partner nation. This increase reduces the value function of the non-partner nation under noncompliance, and therefore induces a larger equilibrium level of $\hat{K}$. The increase in $\hat{K}$ then puts downward pressure on P, which would tend to reduce K. For λ to have a positive impact on K, this latter indirect effect must be weaker than the initial direct effect. Similar constraints are needed to sign the comparative statics concerning changes in t, β, $\hat{\lambda}$, $\hat{t}$, and $\hat{\beta}$. These are shown in the appendix. Under these constraints, the comparative static results for K and $\hat{K}$ yield:

$$K = K(\lambda,\ t,\ \beta,\ \hat{\lambda},\ \hat{t},\ \hat{\beta}) \quad (18a)$$
$$\qquad\quad -\ \ +\ \ +\ \ +\ \ -\ \ -$$

$$\hat{K} = \hat{K}(\lambda,\ t,\ \beta,\ \hat{\lambda},\ \hat{t},\ \hat{\beta}) \quad (18b)$$
$$\qquad\quad +\ \ -\ \ -\ \ -\ \ +\ \ +$$

4.3 *Northern nation compliance*

We assume that if the Northern partner violates the trade accord, the Southern partner responds in all future periods by acting as if the Northern nation is going to levy the optimal tariff.10 Let W^{nc} represent the welfare of the Northern partner nation from violating the trade accord this period and having no trade accord in future periods.

Let $\tilde{W}$ be the welfare level associated with no trade accord. Then:

$$W^{nc} = \int^{znc}_{o} D(a)da - \delta^{nc}z^{nc} + p\tilde{W} \quad (19)$$

where p represents one minus the rate of discount of the Northern partner, z^{nc} represents the imports of the Northern partner given x and $\hat{x}$, but with the Northern partner levying the optimal tariff on all nations. Similarly, δ^{nc} represents the resulting market price in the first period when the Northern partner fails to comply with the trade accord. Since the Northern partner nation levies the optimal tariff in all future periods, the only difference between $\tilde{W}$ and W^{nc} arises in the first period. Moreover, first-period welfare under noncompliance will exceed that under the accord, since the Northern partner nation would be unconstrained.

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10Note that this "punishment" is a Nash equilibrium. If the Northern partner can violate the terms of the trade accord in one period without being punished, it can do it in all periods. Consequently, the optimal Southern partner response is to behave as if there were no trade accord.

For the Northern partner to choose compliance, its expected welfare under the trade accord, W, must be greater than or equal to its welfare under noncompliance, W^{nc}. This condition boils down to requiring that the welfare gain from the accord be enough to offset the one-period gain from noncompliance:

$$W - \tilde{W} > [\textstyle\int_0^{\tilde{z}^{nc}} D(a)da - \delta^{nc}z^{nc}] - [\int_0^{\tilde{z}} D(a)da - \tilde{\tilde{\delta}}z] > 0 \qquad (20)$$

V. Impact of the Trade Accord

In what follows we characterize the equilibrium and derive the implications the trade accord for the three parties involved.

5.1 *Output and Prices*

Let $\tilde{f}$ represent the output of the foreign sector of the non-partner nation in the absence of the trade accord. By equation (13), $\tilde{f}$ satisfies:

$$\tilde{P}[\beta\tilde{s} - (1-\beta-\tilde{t})\tilde{f}] - \beta\tilde{s}\lambda\tilde{P}^p = 0 \equiv \wedge \qquad (21)$$

By equations (13) and (21)

$$D[\beta s - (I-\beta-t)\tilde{f}] = P[\beta s - (1-\beta-\tilde{t})\tilde{f}] \qquad (22)$$

By equation (22), $f > \tilde{f}$ if and only if $D > \tilde{P}$. In other words, an increase in the price faced by exporters from the Southern partner nation is a necessary and sufficient condition for the accord to increase output in the Southern partner nation.

Similarly, let $\tilde{f}$ represent the output of the foreign sector of the non-partner nation in the absence of the trade accord. By (8), the capital constraint faced by the non-partner nation in the absence of a trade accord satisfies:

$$\tilde{P}[\beta s - (1-t-\beta)\hat{f}] - \beta\lambda\hat{P}^n s = 0 \equiv \wedge \qquad (23)$$

By equations (8) and (23), it follows that $\hat{f} < \tilde{f}$ if and only if $\hat{P}/P > P^n/\tilde{P}^n$. This restriction implies that the equilibrium decline in the world price under the trade accord is larger than that which would emerge under noncompliance by the non-partner nation. From the point of view of the rest of the South, when the decline in price under noncompliance is smaller than the decline in price under compliance, equilibrium output decreases.

5.2 *Welfare*

Since the trade accord is assumed to be voluntary, its existence requires that it be welfare increasing to both the Northern and Southern partner nations relative to not entering into the accord. In this section, we examine the conditions under which the trade accord is welfare-enhancing for the two partner nations.

By (12) the difference between the value functions of the Southern partner in the presence and absence of the trade accord satisfies:

$$\tilde{V} - \tilde{V} = [(D-P)s + t(D\tilde{f}-P\tilde{f})]/(1-\beta) \quad (24)$$

Note that there are two channels through which the Southern partner can benefit from the trade accord. The first channel is the increase in the terms of trade it faces (D>$\tilde{P}$), which raises the value of the domestic sector and the tax revenues from the foreign sector, given K. This channel is the standard one addressed in the welfare theory of customs unions. The second channel is the increase in the level of capital the Southern partner nation can support under compliance with national treatment ($f>\tilde{f}$). Recall that the constraint on investment in this model is assumed to be the risk of noncompliance with national treatment, rather than the marginal product of capital. The potential for additional capital inflows, or "financial creation," represents a novel channel for the trade accord to enhance its welfare.

For the Northern partner to voluntarily enter into the trade accord, the accord must also increase its welfare. Therefore $W-\tilde{W}>O$, where W and $\tilde{W}$ satisfy:

$$W = [\int_O^z D(a)da - \delta(x+x-z)(z-x)-D(z)x]/(1-p). \quad (25)$$

$$\tilde{W} = [\int_0^{\tilde{z}} D(a)da - \delta(\tilde{x}+\hat{x}-\tilde{z})\tilde{z}]/(1-p). \quad (26)$$

Comparing equations (25) and (26), we see the trade-off faced by the Northern partner nation. For a given Southern output and Northern partner imports, the Northern partner nation loses tariff revenue from allowing the Southern partner nation to enter tariff free. It follows that the loss in tariff revenue must be made up by a sufficient increase in the Northern partner's terms of trade for that nation's overall welfare to increase.

5.3 *Net effects of the trade accord*

In equilibrium, the trade accord leads to higher output and foreign investment in the Southern partner nation $f>\tilde{f}$). This conclusion emerges from the equilibrium condition (23), which states that output grows if and only if the perceived price grows, and the self-selection constraint (24). It is easily verified that the Southern partner benefits from the accord if its output grows. Moreover, overall Southern output must grow as a result of any equilibrium accord. For example, suppose that there is no accord, such that Southern partner and non-partner output are equal to $\tilde{x}$ and $\tilde{x}$, respectively. Let $\hat{W}$ represent the welfare of the Northern partner in the absence of the trade accord if it chooses to import z, its import level under the trade accord. $\hat{W}$ satisfies:

$$\hat{W} = [\int_0^z D(a)da - \delta(\tilde{x} + \tilde{x} -z)z]/(1 - p) \quad (27)$$

In the absence of the accord, the Northern partner nation is unconstrained in its choice of import level $\tilde{z}$, implying that $\tilde{W} \geq W$. Consequently, for the trade accord to be welfare enhancing to the Northern partner nation, it must be the case that $\hat{W} \geq \tilde{W}$. By (25) and (27), this implies that $\delta(\hat{x}+x-z)(z-x) + D(z)x \geq \delta(\tilde{x} + x - z)z$. For an positive optimal tariff with respect to the Southern non-partners under the accord, $D(z) > \delta(\hat{x}+x-z)$. Substituting, $\delta(\hat{x}+x-z) < \delta(\tilde{x} + x - z)$ is obtained and, therefore, total Southern output must increase with the accord ($\hat{x}+x > \tilde{x} + x$). As long as the Southern partner nation is not too much more productive than the non-partner nation, this will also imply an increase in foreign investment.

The expansion in output also implies an increase in Northern partner imports under the trade accord. Recall that $\tilde{z}$ is increasing in the level of Southern output. Since $\hat{x}+x > \tilde{x} + x$, it follows that $\tilde{z}(\hat{x}+x) > \tilde{z}(\tilde{x} + x)$. We demonstrate in the appendix that given Southern output levels, $z \geq \tilde{z}$. It follows that $z > \tilde{z}$.

The sources of welfare gains for the Northern partner nation under the trade accord are therefore similar to those in the traditional customs union literature. The welfare gains are greater when the trade accord induces a larger increase in the supply of the exportable good, and hence a larger decrease in its price.

However, there are novel implications of the trade accord in the presence of sovereign risk. The accord increases the amount of capital inflows the Southern partner nation can accommodate without choosing noncompliance with national treatment. The sovereign risk effect thus provides an additional source of welfare gains for the Northern partner nation. On the other hand, when the trade accord deteriorates the terms of trade faced by the non-partner nation, it also reduces the level of capital inflows that nation can accommodate under compliance with national treatment. This effect of the sovereign risk channel has the opposite impact on welfare of Northern partner. One might think of this new channel as representing financial diversion, which takes place under the trade accord in addition to the trade diversion discussed in the traditional literature.

In addition, note that the Northern partner's welfare could potentially increase from the trade accord even in the face of a terms of trade decline. This surprising possibility would require Southern partner output to be very price sensitive, so that a small terms of trade increase would lead to a large Southern partner output response. In that case, the Northern partner, in the absence of a trade accord, may find itself facing its own timing inconsistency problem, a scenario under which the Northern partner would benefit from

committing to charging a lower tariff on the Southern partner (as opposed to its time-consistent optimal tariff) in order to increase the level of output in that nation. The trade accord may then also enhance the credibility of the Northern partner as a low tariff importer.

We next turn to the welfare implications for the Southern non-partner nation.

By (7), the difference between the welfare function of the Southern non-partner nation in the presence and absence of the trade accord satisfies:

$$\hat{V} - \tilde{V} = [\hat{P}(\hat{s} + \hat{t}\hat{f}) - \tilde{P}(\hat{S} + \hat{t}\tilde{f})]/(1-\beta) \quad (28)$$

The net welfare impact on the non-partner nation depends on the change in its terms of trade, as well as the change in the output of its foreign sector. As we demonstrate above in (23), $\hat{f} < \tilde{f}$ if and only if $\hat{P}/\tilde{P} > \tilde{P}^{n}/P^{n}$. The net impact of the accord on the welfare of the non-partner Southern nation is therefore ambiguous.

The more standard case would be that the above condition would be satisfied and the trade accord would result in a world terms of trade decline. Under these conditions, the decline in terms of trade would lead to financial diversion in the sense that foreign investment would be diverted away from the non-partner nation. In this case, the non-partner nation would have its welfare reduced by the trade accord.

However, there is another possibility. If the above condition is violated, the non-partner nation may benef~t from the trade accord even if its terms of trade are reduced. This surprising outcome requires that the trade accord have a sufficient positive impact on the ability of the non-partner nation to support foreign investment under compliance with national treatment to more than offset the terms of trade decline. While unlikely, this ambiguity demonstrates the power of sovereign risk considerations to alter our analysis of the welfare implications of trade accords.

VI. Endogenous Taxation Levels

There are many potential determinants of a nation's tax rates. Nevertheless , the framework derived above is one in which the tax levied on domestic producers has a direct impact on government revenues under compliance with national treatment. In this section, we derive the revenue-maximizing level of domestic t, and examine the implications of levying this revenue-maximizing t on the welfare implications of the trade accord.

By (12), differentiating the value function of the Southern partner nation with respect to t satisfies:

$$dV/dt = [(aK/at)f'(Dx(s +tf)+Df't)+Df]/(1-\beta). \quad (29)$$

As we demonstrate in the appendix, aK/at > 0 as long as the direct effects

dominate (for example if the demand function D is moderately concave), which we maintain as an assumption. Consequently, equation (29) implies that the value function of the Southern partner nation is increasing in t as long as it is increasing in K. This will be the case as long as the price decline resulting from increased Southern partner output is not too severe.

Note the role that sovereign risk plays in generating this result. In equilibrium, capital inflows are increased until the recipient country is indifferent between complying and not complying with national treatment. This assumes that when this point is reached and the risk of noncompliance with national treatment becomes a binding constraint on capital inflows, the corresponding economic return on foreign investment is large enough as to yield an after-tax return on investment in excess of alternative home returns. Under this premise, an increase in the tax rate raises the magnitude of capital inflows that can be supported under national treatment and increases Southern partner nation welfare. This result implies that as long as the price response is not too sensitive, the value function of the Southern partner nation is increasing in its domestic tax rate.

Consequently, under these assumptions, the Southern partner nation would choose to raise its tax rate, thus depressing the after-tax return. 11 This process stops when the investment return becomes a binding constraint on capital inflows and further increases in the tax rate would diminish foreign investment despite a credible commitment not to expropriate. This would occur when the after-tax rate of return on investments in the Southern partner nation are equal to the world rate of interest. Let r represent the opportunity cost of foreign capital invested in the Southern partner. Investment in the Southern partner then requires:

$$(1 + r) \leq D(1 - t)f' \quad (30)$$

If the production function f is moderately concave (or linear), higher tax rates would lead to lower tax revenue due to the reduction in foreign investment needed to equalize after-tax returns. Under this assumption, the revenue-maximizing tax rate for both the Southern partner and non-partner nations is that which equates the expected rate of return on investments within the country with the world rate of interest. We assume that Under the trade accord:

$$\hat{t}^* = 1 - (1+r)/\hat{D}f' \quad (31a)$$

$$\hat{t}^* = 1 - (1+r)/\hat{P}f' \quad (31b)$$

for the Southern partner and non-partner nations, respectively, while in the absence of the trade accord:

$$\hat{\tilde{t}}^* = 1 - (1 + r)/\tilde{\tilde{P}}f'. \quad (32a)$$

$$\hat{\tilde{t}}^* = 1 - (1+r)/\tilde{P}\tilde{f}, \quad (32b)$$

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11Strictly diminishing returns exacerbate this tendency.

for the Southern partner and non-partner nations, respectively. Given that the production function is concave, $t*$ is decreasing in K. $t*$ is also increasing in the terms of trade faced by the Southern partner nation. Similar results obtain for $\hat{t}*$, $\tilde{t}*$, and $\tilde{\hat{t}}*$.

The optimal tax rates in equations (31) and (32) are computed based on the equilibrium expectations of the remaining game and then committed, which makes them given parameters from that point onwards. Since the qualitative results derived above for exogenous tax rates hold for any arbitrary tax level (within the assumptions), however, they are robust to the introduction of revenue-maximizing taxes. In particular, it is still the case by (18) that in equilibrium K and $\hat{K}$ are increasing in t and $\hat{t}$, respectively. $t*$ is then determined such that (36) is verified in equilibrium:

$t* = t*(K(t*))$. Similar results again obtain for $\hat{t}*$, $\tilde{t}*$, and $\tilde{\hat{t}}*$.

Neglecting price effects, the revenue-maximizing tax can be analyzed as follows: For $t<t*$, the binding constraint is the risk of noncompliance with national treatment, and the resulting equilibrium K(t) is the one characterized in the model. However, the Southern partner would benefit from a larger tax rate that would encourage additional foreign investment, as K'(t)>0. For $t>t*$, foreign investment is constrained by low after-tax returns, rather than expropriation risk. In this region, larger tax rates lead to lower foreign investment and, under the assumptions, lower tax revenue.

The only constraint posed by the model which does not generalize to levying optimal taxes is the equality of tax levels with and without the accord, $t*=\tilde{t}*$. Therefore, the implications of the southern partner nation benefiting from the accord need to be revised. The revised equilibrium and welfare gain conditions satisfy:

$$D[\beta s-(1-\beta-t)f] = P[\beta \tilde{s}-(1-\beta-\tilde{t}*)\tilde{f}] \quad (33)$$
$$Ds + t* Df \geq P\tilde{s} + \tilde{t}*P \tilde{f}. \quad (34)$$

Substituting the optimal tax conditions (32a) and (32b) into conditions (33) and (34) and combining the two, it is obtained that $f/f' \geq \tilde{f}/\tilde{f}'$. Under the maintained assumption that f is linear or moderately concave, this implies that, as before, $\tilde{f} \geq \tilde{f}$. The remaining output implications shown in the previous section are undisturbed.

VII. Conclusion

The general perception among policymakers is that the most important implications of North-South trade accords such as NAFTA are likely to concern their impact on investment flows. In this paper, we have made an initial effort to understand the channels through which trade accords can affect North-South investment flows. Our analysis shows a potential link between trade accords and investment flows through the impact of the accords on the ability of Southern partner governments to make commitments concerning treatment of foreign investment. We show that these accords can affect both the magnitude and the pattern of inward investment and production, implying the possibility of both trade and financial diversion stemming from a bilateral regional trade accord.

While the paper demonstrates that novel effects emerge under sovereign risk which must be addressed when assessing the welfare implications of trade accords, the qualitative policy conclusions from the paper are similar to those in the old trade-diverting customs union literature (diner 1950): Neglecting the incentives associated with market power in trade, the greatest gains from integration are achieved when integration takes place between the countries which have the greatest potential gains from trade.12 The distinction introduced in this paper is that these gains now include both current trade and inter-temporal trade through foreign investment.

As a result of the bilateral North-South trade accord, output and foreign investment in the Southern partner nation increase. Overall Southern output also grows, but the financial creation in the partner nation may be accompanied by financial diversion from the rest of the South. While the trade accord obviously benefits its voluntary parties, it may hurt the rest of the South.

12The complications stemming from market power in trade are associated with the degree to which the trade accord precludes agents within the partner nations from acting in their nations' global interest. For example, by eliminating tariffs on exports from the Southern partner nation, the trade accord may induce agents to import larger amounts than are globally desirable for that nation as a whole. Moreover, this problem would increase with the gains from trade with the Southern partner nation. However, it should be stressed that this caveat exists for the traditional customs union literature as well as the current model.

APPENDIX

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