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Trade liberalisation and regional integration: the search for large numbers*

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We surveyed the empirical literature using multi-country computable general equilibrium (CGE) models to analyse potential and actual regional trade agreements (RTAs). The studies indicate that these RTAs improve welfare, that trade creation greatly exceeds trade diversion, and that they are consistent with further global liberalisation. The welfare gains are bigger when models incorporate aspects of "new trade theory" such as increasing returns, imperfect competition, and links between trade liberalisation, total factor productivity growth, and capital accumulation. We also conjectured that an RTA expands market size and stability, allowing firms to pursue economies of fine specialisation, generating additional "Smithian" efficiency gains.

1. Introduction

In recent years, regional free trade agreements have proliferated.[1] Some, such as the North American Free Trade Agreement (NAFTA), involve a developing country (Mexico) liberalising trade and deepening links with developed countries (the USA and Canada). The expansion of the European Union (EU) to include, first, countries such as Spain, Portugal, and Ireland; and, second, central European countries, similarly expands links between developing and developed countries – although the gaps are not as great as that between Mexico and the USA. Other arrangements, such as

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[1] See Burfisher and Jones (1998, p. 11, table 1) for a detailed description of the types of regional trade agreements and the degree of integration in each.

MERCOSUR, involved deepening integration among developing countries.[2] Many of these new regional integration schemes have evolved during the Uruguay Round of GATT negotiations, which continued the postwar trend of global trade liberalisation and also expanded the sectoral coverage to include agriculture.

At the same time, intra-regional trade has grown (Frankel *et al.* 1995; Vollrath 1998; Yeats 1998; Hertel *et al.* 1999; World Bank 2000). In some RTAs, such as the European Common Market (Grubel and Lloyd 1971) and NAFTA (Burfisher *et al.* 2001), there is evidence that intra-industry trade has increased substantially.

The proliferation of RTAs has revived the debate over their welfare implications and their impact on the global economy. One school of thought (Bhagwati and Krueger 1995; Bhagwati and Panagariya 1996; Srinivasan 1998) views RTAs as a bad idea, reducing welfare for their members and detracting from efforts to expand global liberalisation under the new World Trade Organisation (WTO). Others, such as Ethier (1998), argue that RTAs reflect a "new regionalism" which complements multilateralism and that they are evidence that developing countries want to participate in a multilateral system currently dominated by developed countries. Another issue is the importance of proximity. Krugman (1993) notes that there are natural trading blocs among neighbouring countries – low transportation costs contribute to welfare gains when these countries form an RTA. There is also a view that countries seek to join RTAs because of fear of exclusion – the domino theory of regionalism described by Baldwin and Venables (1995).

In this debate, there are three important issues which can only be resolved with empirical models. First, do RTAs increase welfare? Trade theory is ambiguous on this point, noting that there can be both trade creation which increases welfare and trade diversion which reduces welfare. Theory offers few insights as to which change will dominate. Second, do RTAs hinder or help multilateral free trade? On this point, empirical models can show the effects of being excluded from an RTA and also consider the impact on member countries of joining an RTA compared to further global liberalisation. Finally, where are the big numbers? Empirical studies of growth in both developing and developed countries support the view that trade liberalisation policies have led to increased trade and have been associated with welfare gains and more rapid growth. What are the sources of these substantial gains?

In the present paper, we argue that virtually all the RTAs studied improve welfare for member countries. First, we review the theory of trade creation and trade diversion which has been used in the current debate over the welfare effects of RTAs. We then consider the voluminous empirical

[2] The original members of MERCOSUR are Argentina, Brazil, Paraguay and Uruguay.

literature analysing the impact of actual and potential RTAs.[3] The results from a large number of model-based empirical studies strongly support a few robust conclusions about these RTAs: (i) they increase welfare of participating countries; (ii) aggregate trade creation is much larger than trade diversion; (iii) large welfare gains appear in models that incorporate features of new trade theory; (iv) there are welfare gains from expanding membership; and (v) global trade liberalisation increases welfare more than the formation of an RTA. We also discuss the impact RTAs can have on agriculture, a sector that until the Uruguay Round, had been largely exempt from multilateral trade reforms. Many countries provide domestic support to agriculture, complicating efforts to reduce trade barriers. We conclude with a brief review of "new trade theory" models which incorporate links between increased trade and economic performance beyond the standard neoclassical theory of comparative advantage. We argue that RTAs encourage changes in the production structure as countries have secure access to RTA-partners markets. These gains, which we describe as "Smithian" because they are related to finer specialisation in production, are potentially much bigger than the welfare numbers associated with trade creation and trade diversion in a Heckscher-Ohlin framework.

2. Trade creation and trade diversion

2.1 Theory

Bhagwati and Panagariya (1996) and Panagariya (2000, 1998) argue that RTAs will likely reduce welfare in member countries and impede multilateral trade liberalisation. Because RTAs give preferential treatment to member countries they divert trade from non-member, least-cost suppliers. They argue that this trade diversion is likely to dominate trade creation so the RTA will reduce welfare in member countries.[4] To illustrate the trade

[3] This empirical literature is seldom cited by those taking a dim view of RTAs. For example, Srinivasan (1998, p. 61) states that the issue of whether or not RTAs are beneficial, including the crucial question of whether trade creation exceeds trade diversion, '… is simply a set of empirically testable, though as yet untested, hypotheses'. This statement is hard to justify given the volume of empirical work on this issue.

[4] Wonnacott (1996) notes that trade diversion is not necessarily welfare-decreasing by definition. Instead, he argues that trade diversion may increase welfare for the diverting country and the world as a whole. Trade liberalisation between partners in an RTA may lead to increased competition and specialisation; firms can exploit economies of scale when they have a bigger market and the partner country may become the least cost supplier in this environment. This is really a "new trade theory" argument. Early in the debate over regionalism, economists such as Lipsey (1957), Gehrels (1956–1957), and Michaely (1976) argued that welfare could improve in an RTA with trade diversion due to consumption gains, which Viner did not include in his analysis.

diversion effects of an RTA, they present Viner's model of a customs union in which two countries remove bilateral tariffs. They present the small union case in which the rest of the world (ROW) is the least-cost supplier and faces constant costs. The RTA partner faces increasing costs. When the RTA is formed, the union partner cannot meet the import demand at a price less than the tariff inclusive price on sales from the ROW. The importer imports both from its RTA partner and the ROW at the price set by the ROW. Total imports are constant but the share from the ROW declines and the share from the union partner increases. The liberalising country loses because it foregoes tariff revenue from the new union member but does not face a lower internal price for the imported good. In this framework, the larger the trade partner as a share of total imports, the bigger the tariff revenue loss when an RTA is formed. Similarly, the trade partner who initially has higher tariffs loses from an RTA because more tariff revenue is redistributed away from it. As an example of the damage from this type of an RTA (e.g. one in which the ROW is the least-cost supplier facing constant costs and the union partner has increasing costs of production), Panagariya (1997) calculates welfare losses as high as $3.26 billion for Mexico from NAFTA. As Mexico had higher initial tariffs than the USA, its loss of tariff revenue exceeds its gains from preferential access to the USA market.[5] Similarly, Panagariya (1996) projects losses for Latin America in a Free Trade Agreement of the Americas (FTAA). Because Latin American countries have higher tariffs than the USA, they will lose tariff revenue when they enter an FTAA. In contrast, when the union partner is the low-cost producer (maintaining the assumption of constant costs, for simplicity), an RTA improves welfare in the liberalising country. It benefits as domestic prices decline and the RTA is purely trade creating.

De Melo *et al.* (1993) note that the case of pure trade diversion, emphasised in Panagariya (1998, 2000), while unambiguously welfare-worsening, is too extreme a model to characterise actual RTAs.[6] They present a more balanced view of the welfare effects of an RTA in an analytical model in which integration both creates and diverts trade. In this case, the country that lowers its barriers against a trade partner faces a new domestic price which is lower than the tariff-inclusive mark-up over the constant cost supplier (the ROW), but higher than the free trade price. The welfare effects on the tariff-reducing country are ambiguous: it loses because it has diverted all imports from the lowest cost supplier, but it benefits

[5] This calculation uses aggregate trade and tariff numbers. Post-NAFTA studies using more detailed data refute this prediction.

[6] See also Winters (1996) and De Rosa (1998) for a discussion of the theory with models that allow both trade creation and trade diversion.

because total imports have increased. De Melo *et al.* note that in this environment: (i) the higher the initial tariff on a given sector, the larger the benefits and the smaller the costs of an RTA; (ii) the lower the post-RTA tariff on non-union countries, the less likely that the lower-priced goods of the latter will be displaced; and (iii) the greater the complementarity in import demands between the union partner, the greater the gains from an RTA. The latter point suggests that there are large gains from an RTA between developed and developing countries – such as the USA and Mexico – which have different factor endowments. Determining the net welfare impact of an RTA in this model is an empirical issue.

Other studies of RTAs identify additional reasons for welfare gains. For example, Burfisher *et al.* (2002b) find that an RTA can improve welfare when it forces a country to remove domestic distortions that are linked to trade restrictions. Krueger (1999) notes that RTAs can lead to multilateralism when they allow developing countries to "lock in" trade reforms, thereby encouraging investment flows. In addition, RTAs may permit member countries to liberalise beyond what could be accomplished multilaterally.

2.2 Empirical evidence

The theoretical models suggest that the net impact of an RTA on trade creation and trade diversion is ambiguous. It depends on the export capacity of the partner country and how the world price from the RTA partner compares to the world price from the least cost producer who is not an RTA member. An RTA can be net trade-creating in one sector and net trade-diverting in another sector. To determine the implications of an RTA for aggregate welfare and trade patterns, one needs economy wide, multi-sectoral, computable general equilibrium (CGE) models. There is now a large empirical literature using multi-country CGE models to analyse the impact of RTAs. We will summarise conclusions from various surveys of this literature and discuss representative studies.[7] As we note below, multi-country CGE models differ widely in terms of country and commodity coverage, assumed market structure, policy detail, and specification of macroeconomic closure. In spite of these differences, surveys of these models support two general conclusions about the empirical effects of RTAs: (i) in aggregate, trade

[7] We review nine surveys: Brown (1993) 12 studies; Francois and Shiells (1994) 10 studies; Baldwin and Venables (1995) 6 studies; Burfisher and Jones (1998) 11 studies; DeRosa (1998) 15 studies; USA International Trade Commission (1992) 10 studies; (1998) 6 studies; Hertel *et al.* (1999) 7 studies; Scollay and Gilbert (2000) 29 studies. While there is some overlap in terms of the models included in these surveys we draw our conclusions from a total of 106 studies. See Robinson and Thierfelder (1999) for a discussion of results from other CGE models, including summaries of a number of models.

creation is always much larger than trade diversion; and (ii) welfare – measured in terms of real GDP or equivalent variation – increases for member countries.

There were numerous CGE models used to analyse the effects of the NAFTA. Surveys of this work (e.g. USA International Trade Commission 1992; Brown 1993; Francois and Shiells 1994) found that trade creation dominated trade diversion. This result is robust across models that differ in terms of demand specifications (Armington versus monopolistic competition, choice of functional form), market structure (perfect competition versus imperfect competition), closure rules (international capital mobility, migration, full employment versus fixed wage, and the trade balance), and intertemporal structure (static versus dynamic). As Brown notes, 'a very large fraction of Mexico's trade is already directed toward the U.S. Consequently, there is very little trade with the ROW [rest of the world] to divert.' (p. 40).[8]

Analysis of post-NAFTA data finds results consistent with the pre-NAFTA conclusions that welfare improves for all members, with the largest gains to Mexico and that trade creation dominates trade diversion. For example, Burfisher *et al*. (2001) review the post-NAFTA studies and conclude that NAFTA improved welfare with the largest gains going to Mexico. Krueger (2000), an eloquent critic of regional trade agreements in the larger debate, concludes that there is no evidence that NAFTA diverted trade from non-NAFTA countries. Examining trade data from 1990–1997 at the three-digit SITC level, she finds few sectors in which imports of any NAFTA country from the rest of the world fell while rising within NAFTA. She finds, '[T]he evidence to date bears out most economists' initial predictions: that for the U.S. the impact of NAFTA has been relatively small, and that for Mexico, changes in trade flows to date do not give much support to the view that NAFTA might be seriously trade diverting' (p. 762).

Industry studies of trade patterns post-RTA find trade diversion in some sectors but that trade creation dominates. For example, Clausing (2001) uses detailed commodity trade data to analyse the effects of the Canada-USA FTA on trade with non-members. She finds that the agreement had substantial trade creation effects, with little evidence of diversion. Wylie and Wylie (1996) and Karemera and Ojah (1998) find similar results for NAFTA.

[8] Brown's perspective contradicts Bhagwati and Panagariya (1996) who argue that the same conditions – high trade shares with the USA and high tariffs – mean Mexico loses from NAFTA because of trade diversion and the loss of tariff revenue (p. 18). The difference between the two approaches is the underlying assumption about the analytical model. Brown presumes both trade creation and trade diversion are possible while Bhagwati and Panagariya presume trade diversion dominates.

Burfisher (2002) surveys empirical models of the Free Trade Agreement of the Americas (FTAA) and also finds that welfare improves following the agreement. Even countries that lose preferential access to USA markets benefit from the FTAA. Other survey articles such as Baldwin and Venables (1995) and DeRosa (1998) do not have a regional focus but rather review a selection of articles describing results for each region. DeRosa (1998) provides a summary table with changes in trade flows and economic welfare for studies of NAFTA, Asean Free Trade Area (AFTA), an Asian-Pacific Free Trade Area, a greater North American Free Trade Area, MERCOSUR, Chilean accession to MERCOSUR, and Chilean accession to NAFTA. For all studies that describe changes in intra-bloc and extra-bloc imports, trade creation exceeds trade diversion. In general, there are welfare gains to member countries.[9]

Baldwin and Venables (1995) provide a summary of the theoretical issues relating to RTAs as well as a survey of some empirical studies.[10] They note that studies of EC92, which removed nontariff barriers to trade in the EC (modelled as reduction in intra-EC trade costs), showed that the EC gains modestly.[11] There are small negative welfare effects on EFTA.[12] However, when the EC92 is extended to EFTA countries there are gains to both the EC and the EFTA.

Scollay and Gilbert (2000) review CGE models of APEC. Consistent with other studies of RTAs, they find that most studies predict welfare gains for all APEC members. They also find that the South-East Asian countries with higher trade barriers than the more developed APEC countries experienced large allocative efficiency gains. Also, countries with high trade dependency on the region experience bigger welfare gains than for those less dependent on the region for trade. This result is consistent with empirical studies of NAFTA in which Mexico experienced bigger welfare gains because it had higher initial tariffs and higher trade dependency than other NAFTA

[9] Harrison *et al.* (2002) find, for certain elasticities, Chile's membership into MERCOSUR reduces welfare for Chile. However, in the analysis they also raise other tax instruments to replace lost tariff revenue. It may be the case that other second best effects are responsible for the welfare decline.

[10] Their discussion of the CGE models of NAFTA come from the surveys in the USA International Trade Commission (1992) and Francois and Shiells (1994) which are also described earlier in the present paper.

[11] They note that these studies focus on manufacturing, approximately one third of EC GDP; they may understate the effects of EC92 which also affects services trade and financial market liberalisation.

[12] They attribute the loss to EFTA to product shifting in models that have imperfect competition.

countries. APEC, unlike other RTAs, is based on the principle of "open regionalism", (e.g. liberalisation should be on a most-favoured nation (m.f.n.) basis). According to Scollay and Gilbert, the CGE studies in which APEC countries unilaterally liberalise, without requiring non-members to reciprocate, find the "free rider" effects insignificant. They conclude that there is little difference between "open regionalism" and an APEC-wide RTA in terms of welfare gains to APEC members. Hertel *et al.* (1999) also review studies of APEC. They conclude that increasing intra-regional trade does not come at the expense of extra-regional trade, that is, the agreement is not trade diverting.

In summary, empirical studies of RTAs using multi-country models such as CGE models that are general enough to incorporate both trade creation and trade diversion overwhelmingly find that aggregate trade creation is much larger than trade diversion and that the RTAs increase welfare. While trade diversion can be shown to dominate in some analytical models, there is no empirical evidence that this will be the case in any of the general equilibrium models examined. Given the large body of empirical work showing that trade creation dominates trade diversion in RTAs, Bhagwati and Panagariya, who use theoretical models that focus on trade diversion to argue that RTAs are a bad idea, appear to be tilting at windmills of their own creation.

3. What do RTAs mean for agriculture?

Many RTAs result in more liberal trade in agriculture among members. (See Sheffield 1998, table 1, p. 95 for a summary of the treatment of agriculture in selected RTAs.) Some agreements, such as the Closer Economic Relations (CER) between Australia and New Zealand and the Baltic FTA among Estonia, Latvia and Lithuania have free trade in agriculture. The Association of Southeast Asian Nations Free Trade Area (AFTA) includes agriculture in its transition to an RTA by 2003. Other agreements, such as NAFTA and MERCOSUR, liberalise trade in agriculture but maintain trade barriers for sensitive products such as sugar in MERCOSUR. At the other extreme, the European Free Trade Area (Iceland, Norway, Switzerland, and Liechtenstein) excludes agriculture.

Burfisher and Jones (1998) survey empirical studies which focus on the implication of a variety of RTAs for USA agriculture. They find the following:

- USA agriculture can gain from participating in various RTAs. The international terms of trade facing the USA in agriculture are expected to improve, with an increase in farm export prices relative to import prices;

- USA agriculture can lose when not a member of RTAs because they divert trade from USA agriculture;
- Agriculture is the source of most USA gains from RTAs. Because agriculture still faces relatively high trade barriers in world markets, its inclusion in trade agreements accounts for much of the USA gains from RTAs;
- RTAs limit the ability of member countries to maintain independent farm programs; and
- RTAs are generally net trade creating in agriculture; and, in some cases, there is no aggregate trade diversion.[13]

Trade liberalisation in agriculture is complicated by the fact that many countries have domestic agricultural support programs that are incompatible with free trade. To the extent that an RTA can induce countries to reform domestic support programs, an RTA encourages deeper integration among its members. Hertel *et al.* (1999) describe economy-wide models of trade liberalisation with a focus on agriculture and domestic policy distortions and find that domestic distortions can offset trade diversion effects. For example, as the EU expands to incorporate seven of the Central and Eastern European countries (CEEC), the rest of the EU benefits from replacing subsidised domestic farm output with imports from new members.[14] Liapis and Tsigas (1998) also examine the effect of EU expansion to include CEEC. In their simulation, the CEEC participate in the EU budget and receive CAP payments. They find trade diversion in agricultural products as EU imports from third countries are replaced by CEEC countries who now receive output subsidies in agriculture. However, it is net trade creating in the aggregate, as they report that the trade balance increases in all regions, except the CEEC.[15]

Burfisher *et al.* (2002b) examine the interaction between domestic reforms and NAFTA. They consider the impact of trade liberalisation among the USA, Canada, and Mexico in a model with and without domestic policy reform. Between 1993 and 1997, the USA and Mexico lowered domestic support levels and "decoupled" payments by making them independent of

[13] They note that the Australia–New Zealand Closer Economic Relations (CER), the Canada–USA Free Trade Agreement (CUSTA) and MERCOSUR have all led to increased agricultural trade with both partners and nonmembers, supporting the view that RTAs can unleash growth in trade that benefits members and nonmembers alike.

[14] In this analysis, they assume that producer subsidies under the Common Agricultural Program (CAP) are not extended to the Central and Eastern European countries who are the low cost producers of agriculture.

[15] In their model, changes in the CEEC reflect both tariff reduction and output subsidies to agriculture under the CAP which bias production towards agriculture. They note that there is an increase in import demand for nonagricultural products in the CEEC.

farmers' production decisions or market conditions.[16] Burfisher *et al.* consider trade liberalisation under NAFTA when countries use decoupled domestic support, as reflected in the 1997 policies. They compare this to NAFTA with domestic price support programs, as reflected in 1993 policies. They find that the welfare gains from NAFTA are larger for all members when countries have decoupled domestic support. When countries maintain price support programs, Mexico's welfare declines under NAFTA because free trade in corn dramatically raised the cost of its price support to domestic corn producers.

The models with agricultural detail reinforce the message from economy-wide models described earlier – trade creation dominates trade diversion. Furthermore, they show that there are additional gains when the RTAs induce countries to reform domestic policies.

4. Membership issues

Important to the theoretical debate is whether RTAs are "building blocs or stumbling blocs" on the route to multilateral free trade.[17] Is there an incentive for RTAs to expand and does this support or hinder further multilateral trade liberalisation? A related issue is whether there is some natural or optimal number of blocs in terms of global welfare and negotiating strategies in multilateral free trade talks. Krugman (1993) uses an analytical model to demonstrate that welfare is higher at small and large number of blocs, and is minimised with three blocs. Frankel *et al.* (1995) elaborate on Krugman's model and show that an RTA formed along natural continental lines can also reduce welfare under certain conditions (such RTAs are termed "super-natural").

Empirical models can offer some insights into these issues. In general, studies find that there are incentives for countries to participate in RTAs. The results support the domino theory of regionalism as described in Baldwin and Venables (1995). Brown *et al.* (1995) simulate an expansion of NAFTA, adding one Latin American country at a time. They find that, as NAFTA

[16] Mexico, under its PROCAMPO program in 1993, eliminated price supports for domestic agriculture and replaced them with an income transfer based on historical acreage. The 1996 USA FAIR act also shifted towards household income supplements and away from market support. The purpose of the changes in each country was to make agriculture more responsive to market conditions. Through emergency measures in 1998–2001, and established formally under the 2002 USA Farm Bill, the USA has re-emphasised price support programs. An analysis of the effects of those programs are beyond the scope of the present paper. See Burfisher *et al.* (2002c) for an analysis of how domestic support programs in OECD countries interact.

[17] Bhagwati (1993) originally coined this phrase which characterised the debate over RTAs.

expands, there are welfare gains for the new members and the welfare gains for the included countries increase. Similarly, Brown *et al*. (1996) describe the effects of an East Asian trade bloc. They begin with trade liberalisation between Japan and South Korea and add incrementally, Taiwan and Singapore. They find that welfare increases for the included partners as well as the new partner as the East Asian trade bloc expands.

Bach *et al*. (2000) analyse the effect of EU enlargement, focusing on agricultural sectors and policies such as the Common Agricultural Policy (CAP) and the EU Commission Agenda 2000 proposal. They find welfare gains for new member countries and a slight welfare loss for the EU countries. The welfare changes primarily reflect a redistribution of income from Western European taxpayers to Eastern European farmers, not trade diversion losses. Frandsen *et al*. (2000) evaluate the effects of EU expansion on non-members. They find slight trade diversion and minor welfare losses in some non-member regions. Other regions enjoy minor welfare gains. On net, they find global welfare increases by 0.5 billion (constant 1995 USA dollars) with a total gain to non-members of 0.4 billion and a European gain of 0.1 billion.

Empirical models also find that the type of membership matters. Lewis *et al*. (1995) analyse the implications of different memberships in an RTA among APEC countries. They find that there are welfare gains from making the APEC RTA as broad as possible. Omitting any one region makes that region significantly worse off and also lowers the gains from the RTA for all members. Exclusion of the USA has the greatest negative impact on all potential members. Furthermore, they find that all countries individually gain more from global liberalisation than they do from joining an APEC RTA alone. While the formation of a regional RTA may be politically easier than achieving continued global liberalisation, there are economic incentives for all parties to expand on the achievements of the completed GATT round. Hinojosa-Ojeda *et al*. (1995) experiment with an extension of NAFTA to include Central America and the Carribean. They find that the USA and Mexico each prefers to be the sole hub, adding "spokes" through bilateral agreements with new countries, but without full expansion of the RTA. It is the worst outcome for either the USA or Mexico to be just a spoke while the other country is the hub – they gain more from expansion of the RTA (although, particularly for the USA, the numbers are small).

Benjamin (1994) uses an empirical model to address Krugman's description of the relationship between global welfare and the size of an RTA. She varies the countries included in a variety of potential RTAs and finds that, in all cases, trade liberalisation increases the volume of world trade and generates positive welfare gains. Contradicting Bhagwati and Panagariya, who claim that higher trade dependency among potential partners reduces

welfare because of tariff revenue diverted (conclusions they draw from a theoretical model with only trade diversion), she finds that higher trade volumes between potential bloc partners enhance benefits to bloc partners and increase the efficiency gains from tariff reduction.

Scollay and Gilbert (2000), in their review of CGE models of APEC, find that overall welfare gains are larger as the APEC RTA expands. The USA International Trade Commission (1998) survey of studies of trade liberalisation among APEC countries finds a similar conclusion in studies that look at membership issues: 'ASEAN countries gain the most from the broadest possible regional liberalisation.' (p. 17). Furthermore, they note that the presence of large countries, the USA and Japan, is important for other ASEAN members.

5. Where are the big numbers?

Much of the theoretical analysis of the potential impact of trade liberalisation has been done using neoclassical trade models. The gains from increased trade arise from countries being able to pursue comparative advantage based on having different factor endowments (as described in the Heckscher-Ohlin model). Is this the correct framework to show the effects of RTAs or, for that matter, global liberalisation? Analysis with neoclassical models seems to get the sign right, but the magnitude wrong – trade liberalisation in these models leads to welfare gains, but empirically they appear to be too small considering the experience of countries which shifted to ''open'' development strategies. The failure of the neoclassical model to provide an adequate empirical framework for explaining the growth of open economies provided a strong impetus to trade economists to explore other links between trade and economic performance. The development of ''new trade theory'' is at least partly a reaction to this failure, as trade economists undertook a search for large numbers.

5.1 New trade theory

In new trade theory both theoretical and empirical models have moved beyond looking only at neoclassical market structures to incorporate features such as increasing returns, imperfect competition, technology transfers, trade externalities, and dynamic effects such as links between trade liberalisation, total factor productivity growth, and capital stock accumulation. These effects are potentially large, and studies incorporating them appear to capture better the stylised facts characterising growth in countries that shifted from ''closed'' to ''open'' strategies. Empirical studies of RTAs incorporating elements of new trade theory invariably find that trade creation greatly

dominates trade diversion and, usually, there is no trade diversion at all since the increased growth of RTA members leads to expanded trade both within the RTA and between member countries and the rest of the world.

Brown (1993) and Francois and Shiells (1994) describe empirical models with new trade theory features and discuss the implications for trade liberalisation. Brown describes the evolution of models from (i) static models with neoclassical market structures to (ii) static models with monopolistic competition and increasing returns to scale and (iii) dynamic models in which either exogenous variables are updated using projected values or agents optimise production and consumption decisions intertemporally. Baldwin and Venables (1995) and DeRosa (1998) also consider models with new trade theory features, but do not provide analysis of the model features.

In all cases, the welfare gains from an RTA are greater as the models become more sophisticated. When the models incorporate imperfect competition and increasing returns to scale, for example, trade liberalisation allows producers to realise economies of scale. Brown finds that Mexico's gain from NAFTA, measured as the per cent increase in real income, is always bigger with increasing returns to scale, often by an order of magnitude. Likewise, Francois and Shiells (1994) find that models with some form of imperfect competition yield larger results than those with perfect competition.

Trade externalities are another change in the production process associated with an RTA (or any agreement which expands trade).[18] Increased competition may induce domestic producers to operate more efficiently. While there is fairly widespread agreement that feedbacks exist, there is little consensus on the channels through which they operate and how big they are.[19] Lewis *et al.* (1995) explore the effects of trade externalities by linking total factor productivity in a sector to its share of exports in production. The effects operate through a simple elasticity equation. They find that Asian FTA is beneficial to all members when there are trade-productivity links: GDP, absorption, and consumption all rise for all participants. More recently, this type of trade-induced productivity link has been an important

[18] DeMelo and Robinson (1992) incorporate the relationship as an externality in an analytical trade model. Total factor productivity growth is a function of the growth of manufacturing exports. On the import side, there is an externality arising from the import of capital goods.

[19] Rather than introduce an externality to explain the trade productivity link, Rutherford and Tarr (2002) identify the increased variety of intermediate inputs available as the source of productivity growth attributable to trade liberalisation. In their analysis firms use a Dixit-Stiglitz aggregate of intermediate inputs. When the variety of intermediate inputs increases due to trade liberalisation, producers can select intermediate inputs that more closely match production requirements. This is a source of productivity gains.

component of the analysis of trade liberalisation in the Western Hemisphere and the WTO (e.g. Diao *et al.* 2001; Burfisher *et al.* 2002a).

The welfare gains of an RTA are bigger still in models that incorporate dynamics. Modellers include dynamics either by (i) specifying a time path for one or more of the exogenous variables and resolving the static model each period with the new values; (ii) endogenising the growth of some variables in the system; or (iii) solving all time periods simultaneously with intertemporal optimisation by producers and consumers. For example, Manchester and McKibbin (1995) analyse NAFTA in a CGE model with changes in financial and real capital flows that respond to increasing total factor productivity and declining risk premiums in Mexico. They find that 'the flow of investment to Mexico leads to a boost in U.S. exports and raises aggregate demand, thereby reinforcing the other positive effects of NAFTA on the U.S. economy.' (p. 204).[20]

5.2 Smithian gains from trade

While the literature on new trade theory is quite large, there is unease in the profession as to whether we have correctly identified the major effects at work. The research program is still active and involves a continuing interplay between theory, econometric estimation and the development of empirical models incorporating new theoretical features. Empirical results from simulation models such as CGE models have played an important part in this work program by quantifying, in a general equilibrium framework, the mechanisms identified in new theoretical models.

As noted earlier, one of the "stylised facts" characterising the formation of some RTAs is a rapid increase in intra-industry trade, especially in intermediate goods.[21] In the literature, the increase in trade in intermediate goods has been called vertical specialisation (Hummels *et al.* 1998), fragmentation (Deardorff 1998a, 1998b), outsourcing (Feenstra 1998) and product sharing (Yeats 1999). In all cases, there are gains from finer specialisation in production based on factor proportion differences. For example, Hummels *et al.* (1998) describe vertical specialisation, by which a good is produced in multiple sequential stages, with two or more countries specialising in the production of one but not all stages. The good that uses the

[20] In general, the CGE studies of NAFTA focused on trade linkages. The few models that did incorporate dynamics did so as exogenous increase in the capital stock for Mexico. Brown *et al.* (1992), Brown (1993), and Robinson *et al.* (1993) find an exogenous increase in Mexico's capital stock in conjunction with NAFTA leads to greater welfare gains for Mexico. Manchester and McKibbin (1995) are the notable exception in the analysis of NAFTA.

[21] See Jones (2000) for a discussion of the theory of trade in intermediates.

imported intermediate is then exported as a final good. Countries specialise in certain aspects of the production process, depending upon their endowment differences. Hummels *et al.* (1998) note that there are additional gains from trade liberalisation as it eliminates multiple taxation on trade in intermediate goods and the final product. Deardorff (1998a,b) describes the theoretical properties of this type of trade in goods produced in intermediate stages which he calls fragmentation. He describes the implications for Ricardian and Heckscher-Ohlin trade models and the effects on factor prices.

Outsourcing is a related topic to vertical integration. With outsourcing a firm relocates stages of production to exploit differences in endowments and factor costs. See Feenstra (1998) for a survey of the impact of outsourcing and increased trade in intermediates on employment and wages. Yeats (1999) labels trade in intermediate goods as product sharing. He estimates the amount of product sharing that occurs in machinery and transportation equipment and finds that at least 30 per cent of total world trade in manufacturing is in components. Trade in components has been growing faster than trade in final products.

Trade-focused CGE models capture the observed increase in intra-industry trade by specifying that foreign goods are imperfect substitutes for domestically produced goods, which allows two-way trade (or ''cross hauling'') at the sectoral level. Increases in intra-sectoral trade are often a major source of trade creation in these models, but the models do not attempt to sort out the nature of such trade at the micro level. The underlying motivation cannot really be differences in factor proportions, because we observe increased trade in sectors where factor proportions are similar across countries.

We conjecture that increases in intra-sectoral trade arise from the fact that an RTA provides an expanded secure market and permits firms to pursue economies of fine specialisation. In North America, for example, the auto industry has become incredibly diffused, with factories specialising in various parts located in different countries. Such diffusion of production would be impossible if international borders represented serious and uncertain barriers to the free flow of components. The RTA provides producers scope for fine specialisation extending beyond national markets. In this environment, efficiency gains from increased trade in an RTA arise from economies of scale in fine specialisation – Adam Smith's pin factory in international markets.[22] These efficiency gains do not arise from differences in factor endowments but from the extent of the market:

[22] Note that these productivity gains are different from welfare gains to demanders from increased product diversity, as suggested by Dixit and Stiglitz (1977). These ''Smithian'' gains would apply to intermediate goods as well as goods for final demand.

> 'As it is the power of exchanging that gives occasion to the division of labor, so the extent of this division must always be limited by the extent of that power, or, in other words, by the extent of the market.' (Smith 1904).

Wood (1995) notes that production processes in developed and developing countries are already so different, that 'developed countries have become specialized producers of skill-intensive manufactures and imports of labor-intensive manufactures are now 'noncompeting' with domestic production' (p. 65).[23] We extrapolate from Wood's description of production differences between developed and developing countries and argue that such specialisation may also generate additional efficiency gains from an RTA. When countries have incentives to increase trade, perhaps arising from differences in factor endowments, and form an RTA that provides an integrated, secure market, then there will also be incentives for producers to exploit Smithian gains as well. From this perspective it is shortsighted to focus on Meade-Viner trade creation/trade diversion issues when assessing the impact of RTAs, because there may well be potential Smithian gains not considered in the standard model.

6. Conclusion

The theoretical debate over RTAs raises a number of issues. A fundamental question is do RTAs improve welfare and if so, what are the sources of these gains? Related to that concern, are RTAs net trade creating or trade diverting? Finally, are RTAs building-blocks or stumbling-blocks to multilateral trade liberalisation?

There is a large body of empirical literature which offers answers to these questions. In the present paper, we summarised the lessons from multi-country CGE models of RTAs and found:

- trade creation greatly exceeds trade diversion in virtually all RTAs studied. In general, welfare for all members increases. Furthermore, welfare for old members increases as new members join the RTA, suggesting that there are gains from expanding the RTA;
- features from new trade theory such as imperfect competition, increasing returns to scale, trade externalities, or dynamics generate larger welfare

[23] Wood uses this description of production in developed versus developing countries to argue that factor content studies underestimate the impact imports have on demand for unskilled labor in developed countries. They must account for the fact that differences in factor costs between developed and developing countries mean labor per unit of output differs.

gains, compared to models incorporating only neoclassical production structures and;

- domestic policy reforms in conjunction with an RTA provide additional welfare gains. Models with detailed agricultural sectors illustrate this point.

Given the overwhelming empirical evidence that RTAs improve welfare, the current debate in the literature over trade creation versus trade diversion is distracting, diverting attention from the more important issue – what are the sources of the large welfare gains which encourage countries to participate in RTAs? From the empirical analysis, we know that neoclassical models of RTAs yield small welfare gains and models that incorporate aspects of the new trade theory yield bigger welfare gains. We described another potential link between increased trade and productivity. RTAs, because they create reliable market access, will encourage finer specialisation in production. In addition to differences in endowments (the source of gains from trade in neoclassical trade theory) there are efficiency gains from widening the extent of the market. The benefits from increased trade in this situation are Smithian and represent an important area for further research.

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