Working Party of the Trade Committee

REGIONAL INTEGRATION:
OBSERVED TRADE AND OTHER ECONOMIC EFFECTS
Acknowledgement

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REGIONAL INTEGRATION

Observed Trade and Other Economic Effects

Executive Summary

1. The purpose of this paper is to provide a review of the main findings of empirical work already undertaken on the effects of RTAs on flows of trade and investment, and their impact on economic welfare. In general, it appears from this literature review that empirical evidence has not so far produced more conclusive results than theory, which sees RTAs as entailing both pros and cons.

2. Overall, the findings of prominent recent ex post studies of RTAs produce a fairly mixed picture, indicating that some RTAs boosted intra-bloc trade significantly while others did not. There is some evidence that external trade is smaller than it otherwise might have been in at least some of the blocs studied, but the picture is mixed enough that it is not possible to conclude whether trade diversion has been a major problem. In addition, these studies do not reach any definitive answer on the welfare impact of RTAs. The paper has also reviewed recent ex post studies using growth regressions to estimate the economic growth effects of RTAs. This literature is far from mature, but most of these studies using growth regressions tentatively suggest that RTAs have had little impact on economic growth.

3. Broadly, the conclusions from representative recent ex ante studies are also that there has been evidence of weak trade diversion, but that the recent wave of regionalism has been trade-creating on a net basis and welfare-improving for member countries and trading blocs as a whole. However, the variation in simulated economic gains is wide, depending on the model used. In models that assume a perfectly competitive environment, the combined effects of trade diversion and trade creation typically give very small welfare gains. However, CGE models of imperfect competition with increasing returns to scale suggest that the pro-competitive effects of RTAs might be more significant for OECD countries. These models increase the estimated gains considerably for EU and NAFTA.

4. As for non-OECD countries the results of ex ante studies suggest that welfare gains are generally modest. These findings seem to confirm the view that RTAs composed of advanced economies tend to show convergence (Ben-David, 1993), while RTAs composed of developing economies may in some cases show a divergent performance (World Bank, 2000). Nonetheless, the weaknesses of CGE models should also be kept in mind.

5. The paper has also pointed to other important effects resulting from regional integration. The first is that RTA formation may in some cases put downward pressure on world prices. This potentially improves the terms of trade of participating countries, although this gain may arise at the expense of third countries. Another effect is that changes in tariffs and trade volumes will lead to a loss of government tariff revenue, which can be a significant cost especially for non-OECD countries where trade taxes are an important source of government revenue. As for investment, there is considerable evidence that RTAs, at least those with large markets, have succeeded in attracting FDI. However, the analysis has so far focused on the impact of RTAs on FDI flows, and the general welfare effects have not yet been discussed in detail, neither for the integrating bloc, nor for the world at large.
6. Recognising that this review has been limited, some suggestions of possible areas for further research are given in the final section. In addition, the Secretariat is constructing a database on available empirical evidence concerning the effects of RTAs.

I. Introduction

7. This paper follows up on the discussion in the Trade Committee on 13-14 February 2001 and forms part of an evolving project to help understand the nature and implications of Regional Trade Agreements (RTAs) and their impact on trade. The main objective is to provide an overview of the principal findings of empirical work already undertaken outside the Trade Committee on the trade and investment effects of RTAs, and their impact on economic welfare. Questions debated in this work include for example: are RTAs trade-creating or trade-diverting? Is regional integration welfare improving? Do different empirical methods of estimation show consistent results? Are the benefits of regional integration visible in all geographical regions to the same extent? This paper also addresses other economic effects of regional integration, but does not consider important non-economic objectives such as the political dimension.

8. The discussion focuses primarily on RTAs in Western Europe and North America, because they are the largest in terms of trade volumes and principally involve OECD countries. At the same time, important findings of studies of some RTAs among non-OECD countries are also included. In addition, the emphasis is placed on recent studies, though some prominent earlier studies are also considered.

9. The paper is organized as follows. The remainder of this section broadly describes recent developments of RTAs world-wide. Section II reviews some theoretical considerations of trade and growth effects of RTAs\(^1\). Sections III and IV summarise, respectively, the main findings of prominent ex post and ex ante studies on the trade and welfare effects of RTAs. Section V then focuses on other important consequent effects of regional integration: the terms of trade effect, the loss of government tariff revenue and the investment effect of RTAs. Finally, the last section explores possibilities for further work in this area.

10. Multilateral trade liberalization in the post-war period has been paralleled by a process of integration through regional agreements. This process was led by the EU (originally the European Economic Community, founded in 1958). Other agreements among OECD countries included the European Free Trade Area (EFTA) and the Australia-New Zealand Free Trade Agreement (today the Australia-New Zealand Closer Economic Relations Trade Agreement, ANZCERTA), which were established in 1960 and 1965, respectively. In the 1960s and 1970s there was also a number of rather inward looking (and largely unsuccessful) RTAs between non-OECD countries.

11. Since the mid-1980s there has been a dramatic increase in regional integration activity, the so-called “new wave” of regionalism. Of the 194 RTAs notified to WTO by the beginning of 1999, 87 were notifications since 1990. Now almost all countries are members of at least one RTA, and more than one third of world trade takes place within such agreements.

12. The EU has played a big role in this recent surge of activity, with the implementation of the Single Market Program in 1992, enlargement of its membership, and several agreements with other

\(^1\) The review here is not exhaustive and the focus is on four main effects, trade creation and diversion, and scale and competition effects. As well as being topics of interest in their own right, the discussion serves to illustrate those effects that are now fully incorporated in prominent empirical studies of RTAs, as researchers have refined techniques.
countries. These agreements, which account for two-thirds of the agreements notified to GATT/WTO since 1990, include the European Economic Area, the Europe agreements with several Eastern European countries, the EU-Turkey Customs Union, the Mediterranean Partnership Agreements, and the recent agreements with Mexico and South Africa.

13. The extension of the Canadian-USA Free Trade Area (CUSFTA) to Mexico through NAFTA marked a breakthrough in the history of regional integration, as for the first time it linked a developing economy to highly developed partners in a trade bloc designed to bolster economic development in all three economies. Links between developing and advanced economies were also being established in the Asia Pacific Economic Cooperation (APEC) forum, which was formed in 1989. APEC is a looser organization committed to trade liberalization on a non-preferential basis with different deadlines between industrial and developing country members.

14. The wave of regionalism in Europe and North America has, in turn, led to an accelerated pursuit of regional schemes world-wide. In Latin America, MERCOSUR was formed in 1991. In addition, the Andean Pact and the Central American Common Market (CACM) were reoriented in 1991 and 1993, respectively.

15. In Sub-Saharan Africa, the blocs in West Africa were formed and reorganised on the basis of old ones. The East African Cooperation forum was created out of the East African Community. In 1992, the Southern African Development Community (SADC) developed out of the South African Development Coordination Conference (SADCC), and was supplemented for many of its members by the Regional Integration Facilitation Forum (formerly the Cross-Border Initiative). Within Asia, in 1990, the formation of the East Asian Economic Grouping (which was later reformulated as the East Asian Economic Caucus) was announced. In 1992, members of the South East Asian Nations (ASEAN) signed an agreement to form the ASEAN Free Trade Area (AFTA) by 2007.

16. RTAs may take different forms depending on the intensity of integration and coverage between countries. The traditional concept of free trade areas involves a removal of internal tariffs and quotas, while permitting members to retain independent external tariff policies. Rules of origin then become necessary in order to establish the conditions under which an item qualifies for preferential access within the area. Customs unions go further, and adopt a common external tariff against non-members.

17. But, it is increasingly recognized that effective integration of markets requires more than the traditional reduction of tariffs and quotas. Many other barriers, such as differing national product standards and border frictions, impede trade and support market segmentation, and RTAs world-wide are increasingly pursuing “deep integration” policies to eliminate these barriers. The deepest form of integration sought is the so-called economic union, which extends the integration process by including harmonization of some member countries’ economic policies, particularly macroeconomic and regulatory policies.

II. Trade and Growth Effects of RTAs: Some Theoretical Considerations

(i) Trade Creation and Diversion

18. The theory of RTAs dates from Viner (1950), who drew the distinction between trade-creating and trade-diverting effects resulting from RTA formation. Viner’s contribution showed that even though an RTA liberalizes trade by reducing at least some barriers, it does not necessarily follow that this will generate net gains from trade. Net gains would be expected if all barriers to trade are reduced on a non-discriminatory basis, but RTAs by their nature discriminate against non-members. In RTAs distortions between sources of supply are not eliminated, but are shifted. If partner country production displaces
higher cost domestic production then there will be gains, or trade creation. However, if partner country production displaces lower cost imports from the rest of the world, this is trade diversion.

19. This analysis constitutes part of the so-called theory of ‘second-best welfare economics’. Given that distortions remain in some activities in the economy, it is not necessarily true that removing just some of the distortions (e.g. eliminating trade barriers on partner countries but maintaining them on third countries) is welfare improving.

20. Researchers have attempted to respond to the fundamental ambiguity resulting from the theory of second-best in several forms. Meade (1955), Ohyama (1972) and Kemp & Wan (1976) identified circumstances where there is no possibility of trade diversion, e.g. no interaction between creation of an RTA and external flows. In what is popularly termed the Kemp-Wan Theorem, these authors proved that for any proposed customs union or free trade area there exists a set of common external tariffs that would precisely leave the new trading bloc’s trade with non-member countries unchanged, so preventing trade diversion from taking place.

21. Also, researchers identified conditions, in terms of changes in endogenous2 variables, for welfare gains. Meade (1955) showed that the higher pre-arrangement MFN tariffs, the higher the pressure for trade diversion following the formation of an RTA. Alternatively, when the external barriers of a regional arrangement are low, the potential for trade diversion is low because lower external tariffs offer less scope for the displacement of imports from third countries.

22. Another approach has been to identify features of economies (in terms of their exogenous3 characteristics) under which countries are more or less likely to gain (or lose) from participation in an RTA. Lipsey (1957) pointed out that opportunities for trade creation appear to be enhanced and those for trade diversion are minimised in cases where an RTA groups countries that are already major trading partners. This is because prior to the introduction of preferences, trade flows are consistent with least-cost sourcing so that the removal of trade barriers will reduce the likelihood that a large number of items will be diverted from third countries’ least-cost suppliers to higher cost suppliers within the RTA. Wonnacott & Lutz (1989), and Summers (1991), using similar reasoning including transportation costs in the costs of supply, developed the ‘natural trading bloc’ argument.

(ii) Scale and Competition Effects

23. A second mechanism through which member countries are affected by RTA participation derives from the fact that market enlargement allows firms to exploit economies of scale more fully. Although Viner (1950) suggested that significant gains from RTAs might be associated with economies of scale, Corden (1972) represents the first formal theory of their potential importance to trade and welfare under customs unions. Essentially, inclusion of scale economies in the theory of RTAs identifies possibilities for firms in member countries to produce greater quantities of products after formation of an RTA. This occurs as trade preferences and resulting shifts in demand in favor of intra-regional trade enable these firms to achieve greater economies of scale and lower output prices as they capture (and create) larger markets for their outputs at home and abroad. Increased production by these firms gives rise to economic gains in member countries, which Corden (1972) terms cost reduction effects.

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2 A variable whose value is determined by other variables within the system.
3 A variable whose value is not determined within the set of equations, or models, established to make predictions or test a hypothesis.
24. In addition to achieving cost reduction effects associated with increasing returns to scale, RTAs may successfully erode market power of dominant firms in participating countries through encouraging market entry of competing firms from other member countries, bringing lower prices (Smith & Venables, 1988). However, the significance of these pro-competitive effects is not assured in recent theoretical studies. For instance, an RTA may only result in a shift of production of goods among member countries, with little or no reduction in market segmentation, and with little or no increase in the number of firms in the bloc producing similar products. Haaland & Wooton (1992) include also the possibility of prices rising in member countries with dominant firms before market integration.

III. Ex Post Studies and Findings

25. The difficulty of economic theory to derive firm conclusions regarding the effects of RTAs, except under special circumstances and sometimes restrictive assumptions (albeit, in accordance with the theory of second-best) has prompted the undertaking of empirical studies where individual circumstances of RTAs are taken into account to attempt to reach more definitive answers. Empirical studies of RTAs may be classified as mainly ex post or ex ante (see Box 1). Ex ante studies, which allow for some estimation of the welfare effects of RTAs, will be considered in the next section.

Box 1. Principal Empirical Measures of the Effects of RTAs

Early ex post studies of regional integration attempted to document effects on trade by reporting simple statistics on shares of intra-regional flows in total trade. Following the Vinerian distinction, an excessive increase in the share of intra-regional flows was typically taken as an indication that trade diversion was predominant and the regional integration program was welfare-reducing.

As pointed out by several researchers, the share of intra-regional flows is not a reliable measure of the extent of trade creation and trade diversion. Both theoretical and empirical considerations suggest that the share of intra-regional flows depend on many factors in addition to trade policy, including inter alia the size of the countries involved (larger economies trade more) and the distance between them.

The standard way to control for other effects is to build an econometric model of trade, and see whether the estimated relationships change as a consequence of implementing the RTA. The usual model for such purposes is the gravity model, which estimates bilateral trade between countries, generally for a sample of many countries and for several different dates. It explains trade between pairs of countries as a function of their GDPs, populations, the distance between them (as a proxy for transport costs, cultural similarity and business contacts), and physical factors such as sharing a land border, and being landlocked or an island. These variables control for the factors that are assumed to explain ‘normal’ trade between countries and thus define the so-called anti-monde for RTA members: in the absence of an RTA, members’ trade would have the same relationship to the gravity variables as the rest of the countries in the sample.

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5 See for example Frankel (1997) and Faini & Grilli (1997).
6 Researchers have used the so-called concentration ratio and intensity coefficient to deal with the problem of size. Notwithstanding the important results achieved by these measures (see Frankel, 1997), distance as well as other factors are essential to uncover evidence of true bias in trade patterns.
Researchers add to the list dummy variables that capture whether or not countries are in a particular RTA. If these show up positively for pairs of countries in an RTA, then they indicate that these countries trade more than would be suggested by other factors. A fall in the value of a dummy for trade between a member and non-member is indicative of trade diversion, particularly if the fall shows up after formation of the agreement.

Still, there are problems with the gravity equation approach. First, there are a number of specifications of the model, each different from the other, and there is only limited theoretical support for any particular specification. Second, the dummy variables used to distinguish the effects of RTAs are blunt instruments that have difficulty capturing only the effects of preferential trade liberalization. Third, these studies examine trade flows at a very aggregate level. Since these studies are therefore unable to exploit variations in the extent of trade liberalization across goods or industries, it is more difficult to distinguish the effects of liberalization from other influences that are acting on trade flows.

A different ex post approach developed recently, focuses on the economic growth effects of RTAs. This approach, so-called growth regressions, estimates simple linear growth models using a variety of independent variables, including dummies or proxies for regional integration. Researchers generally quantify the growth effects from the sign and significance of the RTA proxy.

There are shortcomings with this literature that are also worth noting. First, many of the regressors are endogenous; thus the correlation between the included and omitted variables may bias the estimates. Second, the regressions cannot establish causality. It could be that purely domestic factors drive exports and growth separately, so that the coefficients on the RTA proxies and dummies reflect only an inaccurate correlation.

The econometric models used in ex post studies have the advantage that they can appraise with standard statistical criteria. However, their drawback is that they cannot capture the complicated interplay of effects which may be important for large policy changes as in the case of the formation of RTAs. In addition, macroeconometric models have been criticised because of their “static” nature. This is the essence of the Lucas critique (Lucas, 1976), according to which it is difficult to use these models for policy evaluation because the policy change itself changes the model.

Ex ante studies employing so-called computable general equilibrium (CGE) models allow for more interaction among endogenous variables. The most common method used in CGE models is the

7 One difficulty is that such dummy variables may also capture other effects that are difficult to distinguish from preferential trade liberalization. For instance, Frankel (1997) uses a gravity equation to estimate the effects of European integration. He finds that the only years that the EC dummy is statistically significant and positive are 1985 and 1990. Since the trade liberalization that occurred within the EC does not particularly coincide with the years in which this dummy variable is larger, the dummy variable may be indicating that trade within the EC is becoming more "regionalized". This need not imply, however, that trade creation has occurred due to preferential liberalization.

8 In Robert Lucas’ own words, “The thesis of this essay is that it is the econometric tradition, or more precisely, the theory of economic policy based on this tradition, which is in need of major revision ... More particularly, I shall argue that the features which lead to success in short-term forecasting are unrelated to quantitative policy evaluation, that the major econometric models are (well) designed to perform the former task only, and that simulations using these models can, in principle, provide no useful information as to the actual consequences of alternative economic policy (Robert Lucas, 1976, pp. 19-20)".
“calibration” technique, which involves taking some parameter estimates from diverse econometric studies, setting the values of other parameters (for which estimates are not available) in accordance with the researcher’s prior beliefs, and choosing the remaining parameter values so that the model exactly fits the data for some base year.

The strength of models of this type is that they typically contain a great deal of microeconomic detail, so they can be used to predict changes in production in each sector and changes in factor prices, as well as real incomes. As such, they represent the usual source for answers to policy makers’ detailed queries about the anticipated effects of trade policy on domestic markets. In their most refined forms, they include increasing returns and imperfect competition, thus incorporating effects discussed in Section III, such as exploitation of economies of scale and increased competition. In some cases, they can also allow for capital accumulation.

However, these models have the weakness that they are not usually fitted to data as carefully as econometric models, and they are also not subject to the same statistical testing. Moreover, to implement large complex models, the researcher is compelled to make a number of essentially arbitrary choices regarding data and parameter values.

(i) Early Ex Post Studies

26. Before turning attention to consider recent studies, it is instructive to review the principal findings of early ex post studies on the effects that RTAs had in the past. These studies concentrated primarily on Western Europe, which, as previously mentioned, has been the centre of post-war regional integration, although some studies also considered early RTAs among non-OECD countries.

27. As mentioned in Box 1, early ex post approaches to assessing the impacts of RTAs used simple investigation of intra-regional trade patterns after the formation of an RTA. Considerable expansion of intra-European Community (EC) trade occurred during the 1960s. Intra-EC trade as a share of total EC trade increased from 35 percent in 1960 to 49 percent in 1970. With the expansion of the EC in the early 1970s to include Denmark, Ireland and the United Kingdom, intra-EC trade as a share of total trade grew more slowly, from 49 percent in 1975 to 52 percent in 1981.9

28. More sophisticated early ex post studies of RTAs focused on the impacts on EC trade in manufacturers after the Rome Treaty of 1957. These studies using a variety of approaches – Truman (1969) and Prewo (1974) using trade share measures, Balassa (1967, 1975) using income elasticities of demand for imports and the assumption that higher elasticity values imply trade creation and Aitken (1973) using the gravity model – found that the EC was trade-creating on a net basis for both the new trading bloc and the world at large. As concerns the structure of intra-EC trade, computations by Balassa (1975) and Buigues, Ilzkovitz, & Lebrun (1990) show that the share of intra-industry trade in total EC trade steadily increased since the establishment of the Community, reflecting continued product differentiation and scale effects.

29. Balassa (1975) went beyond estimating the impact of the EC on trade, and considered the impact of the RTA on EC welfare. Using the average EC tariff rate for manufactures and his own calculation of trade creation for 1970, he estimated that EC welfare was improved by $0.7 billion per annum, or 0.15 percent of GDP per annum. In addition, he considered the cost of trade diversion under the EC Common

Agricultural Policy, which he estimated at approximately $0.3 billion per annum. Therefore, he arrived at a net welfare gain of $0.4 billion per annum, or less than one-tenth of one percent of EC GDP per annum.

30. In contrast, early studies of RTAs among non-OECD countries often found the growth of intra-bloc trade lacking. These findings are attributed not only to fundamental factors such as similarity of resources endowments of neighbouring countries, but also to the frequent failure to fully implement the terms of the RTAs. Nogues & Quintanilla (1993) reported that intra-regional trade in manufacturers in ANDEAN countries during 1965-90 grew only from 0.1 percent of GDP to 0.6 percent of GDP. Also, Naya & Plummer (1991) reported that the early preferential arrangement among ASEAN countries failed after its first decade to increase intra-bloc trade much above its traditional level of 15 to 20 percent of total ASEAN trade.

31. In Africa the picture is similar. Forountan & Pritchett (1993) reported that the share of intra-regional trade in the SADCC represented only 2 percent of total trade at the end of the 70s, and has remained roughly constant over the years.

(ii) Recent Ex Post Studies

32. The current resurgence of RTAs world-wide has inspired a number of recent ex post studies, using a variety of approaches. Two representative studies of recent application of the gravity model on a wide range of RTAs are by Frankel (1997) and Soloaga & Winters (1999). The former investigates seven blocs over 1965-92 and the latter investigates nine major blocs over 1980-96. The main findings of these two studies, as well as important findings from other prominent recent studies, are presented below for each bloc considered. These include RTAs in Western Europe and North America, as well as MERCOSUR, ASEAN and SADC. Table 1 presents a summary of the main findings of the studies employing the gravity model for the blocs considered here.

33. As regards Western Europe, despite the high level of intra-EC trade in the 1960s and 1970s that shows up in measures such as trade shares, Frankel finds that most of this trade can be explained by other variables, such as GDP and proximity. Only from 1985 does the change of intra-bloc trade attain a significant level, suggesting that in 1990 two EU members traded one third more than two otherwise similar countries. These results resemble those of Soloaga & Winters, who find that intra-bloc trade in Europe is generally below ‘normal’ and has a positive significant trend only since 1985. For EFTA, both studies find that the change in intra-bloc trade is not significant.

34. Both studies find evidence of trade diversion for the EU and EFTA. Frankel’s specific tests of the expansion of the EC-6 to 9 in 1973 and the expansion of the 9 to 12 in the early 1980s find a reduction in trade between existing members and the rest of the world. Similar negative effects occur in the case of EFTA. Soloaga & Winters also find that these RTAs had relatively high levels of extra-bloc trade, although they showed a negative trend during the period, suggesting that trade diversion occurred.

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10 EU, EFTA, NAFTA, MERCOSUR, ANDEAN, ASEAN, and ANZCERTA. The author also tests broader less formal blocs currently existing only as proposals or hypothesis, which are outside the scope of this paper.

11 EU, EFTA, NAFTA, MERCOSUR, CACM, the Latin American Integration Association (LAIA), ANDEAN, ASEAN, and the Gulf Cooperation Council (GULFCOOP).

12 Neither study considers RTAs in Africa.
35. Using similar techniques, Bayoumi & Eichengreen (1995) find that the formation of the EC had a significant impact on trade among its members. At the same time, the study finds that trade between the EC and other industrialised countries fell at 1.7 percent per annum.

36. Considering North America, Frankel’s estimates for CUSFTA suggest that the agreement did not have a significant effect on intra-bloc trade. These results are confirmed by Clausing (1995). At the same time, by using disaggregated data and information on tariffs before and after the agreement, Clausing finds that the boost to trade was significantly greater in commodities that were subject to high tariffs than those subject to low tariffs.

37. Soloaga & Winters find that changes in intra-bloc trade for NAFTA have not been significant. In addition, as for EFTA and the EU, extra-bloc trade fell over the period, suggesting that some trade diversion occurred. These results are similar to those of Krueger (1999). Her estimates of the gravity model also find that the change in trade among NAFTA countries was not significant, while the estimates indicate that NAFTA countries import less from non-NAFTA trading partners than predicted by the gravity determinants.

38. At the same time, Krueger uses a different ex post approach to estimate the effects of NAFTA. She employs “shift and share” analysis to examine the changes in volumes and patterns between commodity groups and among NAFTA countries and the rest of the world. The evidence indicates that those commodity categories in which Mexican exports to the US grew more rapidly were also those categories in which exports grew more rapidly with the rest of the world. This seems to indicate that the expansion of trade was trade-creating, and not trade-diverting.

39. By contrast, for MERCOSUR the picture looks rather different. Frankel and Soloaga & Winters show intra-bloc trade above expected levels. Frankel also finds trade between MERCOSUR and non-member countries increasing over the period, presumably reflecting the unilateral MFN trade liberalisation by the future MERCOSUR members, which started during the late 80s. Soloaga & Winters, who differentiate between bloc overall propensity to import and bloc overall propensity to export, find that import and export propensities displayed opposite movements. These results suggest that MERCOSUR members’ trade performance was dominated by other factors rather than trade policy, such as currency overvaluation.

40. A different ex post study of MERCOSUR that has engendered a great deal of interest is work done by Yeats (1997). By investigating commodity patterns of exports by MERCOSUR countries, he finds that the fastest growing products in intra-bloc trade are capital-intensive goods in which MERCOSUR countries did not previously display strong export performance. Therefore, Yeats finds that the new patterns of trade of members are at odds with what their historical comparative advantage would predict (the anti-monde in the Yeats study), suggesting possible adverse effects of the RTA on members and the world at large.

41. Frankel’s estimates for ASEAN find a significant apparent intra-regional bias during the period considered, suggesting that the RTA boosted trade among its members an estimated fivefold. These results are confirmed by earlier studies by Wang (1992) and Winters & Wang (1994). Their gravity tests suggest that ASEAN is one of the most significant trading areas of the world. By contrast, Soloaga & Winters show that the agreement did not have a positive effect on intra-bloc trade, especially between 1987 and 1995. Both Frankel and Soloaga & Winters suggest that ASEAN countries are significantly more open than predicted by the gravity determinants.

42. A prominent application of the gravity model to Sub-Saharan African (SSA) RTAs is work done by Elbadawi (1997). The results are fully compatible with the pattern of intra-regional trade reported by
earlier studies. The results indicate that the agreement did not have a significant effect on trade for its members, although the performance of the bloc is slightly improved when controlling for exchange rate policy effect. These results are similar to those found by the OECD (2001).

(iii) Growth Regressions

43. Using EC time-series data, Italianer (1994) estimates a linear regression relating the rate of economic growth to a set of variables that includes an RTA proxy, defined as intra-EC trade as a share of total EC trade. He finds that the RTA proxy is positively and significantly related to the growth rate, suggesting that the RTA had a positive impact on economic growth. By contrast, De Melo, Montenegro & Panagariya (1992) find that RTAs have little or no growth effects. They estimate a linear regression of income growth rates, controlling for six RTAs (EU, EFTA, two Latin American RTAs and two African RTAs), and find that only the South African Customs Union has a positive effect on economic growth for its members.

44. More recently, Vamvakidis (1998) also finds that RTAs did not affect growth significantly. He estimates a linear regression controlling for the EU and various agreements among non-OECD countries over 1970-90. The results indicate that only the EU has a positive and significant effect on economic growth, while this is not the case for all other RTAs. However, controlling for openness and other variables, even the EU impact becomes insignificant.

IV. Ex Ante Studies and Findings

(i) Early Ex Ante Studies

45. Ex ante studies undertaken at an early date were rare and focused mainly on the EC comprised of its six original members and on North America. Using a partial equilibrium model, Verdoorn (1960) found that the EEC was trade-creating on a net basis. His estimated static welfare gains were insignificant, at less than 0.05 percent of GNP per annum. Another early study by Balassa (1962) using the calibration technique and the partial equilibrium model, also indicated that the welfare effects of the customs union were insignificant. The author pointed out the important effects not incorporated in the model, including scale, competition and general equilibrium aspects, as a major reason for the findings.

46. Early ex ante studies also attempted to estimate the effects of a potential US-Canada free trade area. Using a partial equilibrium model, Wonnacott & Wonnacott (1967) estimated the gain to Canada from free trade with the US at 10 percent of GNP per annum. More recently Cox & Harris (1985) used a CGE model to study the welfare effects of CUSFTA. They estimated its welfare effects as positive for Canada (8.5 percent of GDP per annum), but negligible for the US by virtue of its larger size. They also suggested that the presence of scale economies increases the gains from trade. The study also indicated an expansion of bilateral trade and a decline in trade with third countries as a whole.

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13 ASEAN, Andean Common Market (ANCON), CACM, and Union Douaniere et Économique de l’Afrique Centrale (UDEAC).

14 Some ex ante studies of RTAs among non-OECD countries were also undertaken at an early date. See for example Wilford (1970) and Cline (1978). This literature supports the impression that RTAs among non-OECD countries had little economic impact during the 1960s and 1970s.
(ii) **Recent Ex Ante Studies**

47. More sophisticated CGE models have recently been applied to analysing the trade and welfare implications of the new wave of regionalism. Findings of most prominent studies of major blocs are considered here, in the same order as in the previous section\(^{15}\). Tables 2 and 3 present a summary of the main results of these studies.

48. Representative of ex ante work on the EU Single Market Programme are three studies by Gasiorek, Smith, & Venables (1992), Haaland & Norman (1992), and Harrison, Rutherford & Tarr (1994). Using models of imperfect competition with differentiated products and increasing returns to scale\(^{16}\), these studies indicate that deepening of economic integration in the EU should be expected to achieve economic gains that are positive and generally significant (between less than 0.50 percent and more than 3 percent of GDP per annum), owing predominantly to pro-competitive effects of product standardisation (with increasing returns to scale\(^{17}\)).

49. The results also suggest the occurrence of appreciable trade diversion following integration, possibly limiting gains in welfare in the EU, with rationalisation of production and closing of a large number of EU firms (in the face of declining terms of trade and profit margins). In addition, the results indicate losses in economic welfare in other parts of the world, with a 10 year impact arguably appreciable for EFTA (of 1 percent of GDP) and insignificant for Japan and United States (0.1 percent of GDP).

50. Brown, Deardorff, & Stern (1992), Roland-Horst, Reinert, & Shiells (1992) and Bachrach & Mizrahi (1992) are among the most prominent ex ante studies of NAFTA. The first two studies use a CGE model of imperfect competition with differentiated products and increasing returns to scale. The third study involves a more simply specified model, assuming perfect competition and constant returns to scale in production.

51. All three studies found that NAFTA provides positive gains to members, and as might be expected, the largest proportionate gains tend to be found for Mexico. However, there seems to be a wide variation in simulated economic gains, with the highest gains found by the Roland-Horst, Reinert, & Shiells study (gains range from 2 to more than 3 percent of GDP per annum for the US and Mexico respectively, to 10.6 percent of GDP per annum for Canada) and the smallest gains found by the Barchrach & Mizrahi study (gains range from insignificant for Canada and the US to 0.32 percent of GDP per annum for Mexico\(^{18}\)).

52. Only the simulation results of the Brown, Deardorff, & Stern model provide explicit indication of possible effects of NAFTA on third countries. This model indicates that, although substantial diversion of trade with non-members might occur, the impact on welfare in the rest of the world is unlikely to be

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\(^{15}\) This section is based, primarily, on Baldwin & Venables (1995), and DeRosa (1998).

\(^{16}\) The first two models use uniform pricing by firms across EU markets to reflect market integration, while the latter study employs an even more sophisticated model which represents standardisation of products by increasing values of substitution elasticities of demand in EU countries. This reflects significantly increased possibilities for substitution in demand in member country markets for similar products produced by competing EU firms.

\(^{17}\) However, when the authors include capital stock accumulation the results are more significant for some countries. For example, gains amount to more than 7.50 percent and more than 6 percent of GDP per annum for the Netherlands and Belgium, respectively.

\(^{18}\) However, when the authors include capital stock accumulation the results are more significant for Mexico, (up to 5 of GDP per annum).
appreciable. However, the possibility of significant negative impacts on individual non-members should not be discounted\textsuperscript{19}.

53. As it regards RTAs among non-OECD countries, two recent ex ante studies by Flores (1997) and by Hinojosa-Ojeida, Lewis, & Robinson (1997), provide a fairly encompassing view of expected effects on trade and welfare of MERCOSUR. The former uses a model of imperfect competition with increasing returns to scale, and the latter uses a model of perfect competition under constant returns to scale.

54. Both models predict that MERCOSUR will be trade-creating, without even modest trade diversion. However, the Flores model finds substantially lower trade effects for MERCOSUR than the Hinojosa-Ojeida, Lewis, & Robinson model. In addition, the Flores model finds welfare effects that are generally positive and significant (between 1 percent and more than 2 percent of GDP per annum), while the Hinojosa-Ojeida, Lewis, & Robinson model finds welfare effects that are generally positive but insignificant (less than 0.25 percent of GDP per annum). The explanation for the difference seems related to the Flores model’s specification of imperfect competition and increasing returns to scale. With regard to the effects on the rest of the world, Hinojosa-Ojeida, Lewis, & Robinson find that other countries might enjoy substantially expanded trade with MERCOSUR, amounting to more than $600 million.

55. Two recent ex ante studies by DeRosa (1995) and Lewis & Robinson (1996), both using CGE models with perfect competition and constant returns, find that ASEAN is trade-creating on a net basis. Both studies found that ASEAN contributes comparatively little to higher economic welfare for members (gains range between 0.25 and 0.50 percent of GDP per annum), except possibly for the two highest-income and particularly open economies (Malaysia 1.30 percent of GDP per annum and Singapore more than 3.50 percent of GDP per annum), which supply the largest proportion of the increased intra-regional demand previously supplied by countries outside the region. The two studies also found little or insignificant negative effects on non-members.

56. A rare ex ante study on southern Africa is work done by Lewis, Robinson, & Thierfelder (1999). The authors employ a CGE model with perfect competition and constant returns to scale, and consider the effects of a SADC FTA (parallel to the EU-South Africa FTA) and a trilateral agreement which includes the EU as well.

57. The results indicate that in either type of RTA trade creation exceeds trade diversion. The results suggest that the EU is more important than South Africa for trade and growth in the rest of southern Africa, as the latter gains far more from a trilateral RTA. Its real GDP increases by 4.1 percent per annum with a trilateral agreement, whereas its real GDP increases by only 0.33 percent per annum when it forms the RTA with South Africa alone. The study also finds insignificant negative effects on non-participating countries.

V. Other Issues: Terms of Trade, Government Loss of Tariff Revenue and Foreign Direct Investment

58. Although the focus of empirical studies of the effects of RTAs has been primarily on the changes in trade flows induced by regional integration, other consequent effects deserve attention. The first is that changes in trade flows may lead to a change in world prices, potentially improving the terms of trade of participating countries, although this gain may arise at the expense of third countries.

\textsuperscript{19} Leamer et al. (1995) discusses the case of the potential negative impact of NAFTA on Central American countries.
59. In a rare ex post study on this issue, Chang & Winters (1999) show that Brazil’s membership in MERCOSUR has been accompanied by a substantial decline in the relative prices of imports from third countries. Formal econometric estimates suggest that these changes in relative prices are largely due to the reduction in tariffs on members’ exports to the bloc (in this case Brazil), compared to those on world exports. The results also show that third countries’ export prices in the Brazilian market declined in absolute as well as relative terms during the integration period, indicating that MERCOSUR’s terms of trade have improved at the expense of the rest of the world.

60. The second effect is that changes in tariffs and trade volumes will generally lead to a loss of government tariff revenue. The cost depends on the social cost of raising funds in alternative ways, and can be severe especially for non-OECD countries where trade taxes are an important source of government revenue. For example, Fukase & Martin (1999) argue that Cambodia’s entry into ASEAN provided a powerful stimulus for the introduction of a value added tax to compensate for the loss of customs duties amounting to 56 percent of total tax revenue prior to its entry into the agreement. The World Bank (2000) shows that in the SADC, where some countries are strongly dependent on trade with South Africa, substantial revenues are also involved, amounting to 9.8 percent and 5.6 percent of government revenue for Zimbabwe and Zambia, respectively. On the positive side, it is important to stress that RTAs can potentially boost economic growth, resulting in an overall increase in tax revenue.

61. A third and more important effect that has been more commented on is foreign direct investment. Because preferences alter the incentives facing firms, both those located within and outside the bloc, the formation of an RTA is likely to influence direct investment flows. It should be noted that the effects of RTAs on investment may in some cases anticipate the effects on trade.

62. Some FDI is motivated primarily by the desire to get behind trade barriers. Other FDI is motivated by foreign investors seeking to exploit input or output markets located abroad in activities where operating a foreign affiliate seems the most efficient strategy. Some other investment projects may be undertaken to reap economies of scale or because of increased market competition. The response to an integration agreement will depend on each individual case, and will reflect potentially offsetting influences. Theory does not offer definitive conclusions regarding the general impact of regional integration on investment. Thus, what happens is basically an empirical question.

63. Earlier empirical work on regional integration and FDI has focused primarily on the effects of European integration. The period following the formation of the EC coincided with a structural shift in direct investment inflows towards the bloc, and several studies from the 1960s and 1970s asked whether the integration process was the determining factor for such inflow. Rare attempts to estimate the impact of economic integration on intra-regional investment are studies by Franko (1976) and Pelkmans (1984). These studies found that European integration coincided with a clear shift in the location of production of multinationals of EC parentage. In other words, these studies found signs of “investment diversion”. More recent work undertaken by the EC (The Single Market Review 4 (1) 1998) indicates that a major source of FDI accompanied the Single Market Program in 1992. The study finds that the EU’s share of worldwide inward FDI flows increased from 28 percent to 33 percent during 1982-93.

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20 For example internalising intangible assets in order to compete with superior knowledge of the local market, consumer preferences, and business practices. See Blomström & Kokko (1997).

21 Some exceptions are early studies of RTAs among non-OECD countries by Behrman (1972), Myltelka (1979), and Thomas (1982).

64. A recent prominent study on the effects of RTAs on FDI is work done by Blomström & Kokko (1997). They focus on three kinds of regional integration: North-North integration (Canada joining CUSFTA), North-South integration (Mexico’s accession to NAFTA), and South-South integration (MERCOSUR). The study finds that the creation of CUSFTA had relatively little influence on direct investment patterns in Canada, since much of the trade between Canada and the US had been liberalized long before CUSFTA was established.

65. By contrast, Mexican accession to NAFTA had a profound impact on FDI. Flows into Mexico more than doubled in the year after the launch of NAFTA, and Blomström & Kokko argue this increase was mainly by non-NAFTA members’ firms taking advantage of preferential access to the bigger northern market. In MERCOSUR there is also evidence that strong investment expansion has coincided with the integration process. The inflow of FDI into the region more then tripled between 1989 and 1993. In addition, in 1995 alone, the US stock of FDI in the region increased by more than 25 percent, a rate significantly higher than the rate of growth of US investment in the rest of the world.

66. Although the underlying assumption is that increased FDI flows are beneficial to economic growth in the integrating region, it should be recognized that the welfare effects on the region might not be positive if the RTA worsens the allocation of resources or adds new distortions in the regional market. In addition, the welfare effects may also be negative if the RTA diverts investment from other countries to the region in question. On the positive side, there is evidence that FDI can be an important factor in stimulating production in related industries, in increasing productivity in neighboring firms, and in transferring technology 23.

VI. Possible future directions for researchers

67. Considerable empirical work has been and continues to be undertaken on the effects of RTAs. The current survey has been limited and it may be useful to note some areas that could merit the attention of researchers in the future. These areas could include:

- The distribution of gains resulting from regional integration. This could encompass both the distribution of gains within countries (i.e. sectors and factors of production) and between countries.

- Inclusion of more RTAs or regional arrangements. Especially, the discussion could focus on three main kinds of regional integration that have not been directly addressed in the present paper:
  - Bilateral agreements between a bloc or a big country and small countries (e.g. EU-Turkey Customs Union or Europe-Maghreb Trade Agreements)
  - Bilateral agreements between two small/medium-sized countries (e.g. ANZCERTA)
  - Looser organisations such as APEC and United States-European Union Transatlantic Economic Partnership

- The effects of deep integration. Especially, the focus would be on studies that attempt to quantify the trade and economic impact of the incorporation of policy reforms that go beyond the elimination or reduction of tariffs, which is increasingly being done in RTAs world-wide.

23 See Blomström & Kokko (1997), and Saggi (1999).
• The long-run growth effects of RTAs. The literature on trade and growth suggests mechanisms through which an RTA may influence long-run growth. The first such mechanism is that an RTA might promote the volume of technological spillovers between members, leading to a positive effect on growth rates and income levels. Another mechanism can arise if an RTA directly affects the efficiency of sectors that produce accumulable factors, as for example the knowledge-creation sector (R&D). The impact of trade on these mechanisms has been studied by Grossman & Helpman (1991), and Coe & Helpman (1995), and the literature search could be extended to see if some interesting findings could be included on the regional dimension of these mechanisms.

68. Given the large and increasing number of studies in this area, it was agreed that the Secretariat would develop a database which could facilitate a more comprehensive analysis of the effects of RTAs.
ANNEX

Figure 1 Intra-Regional Exports, 1990 and 1999, as a Share of Total Exports
Table 1 Recent Ex Post Studies of RTAs Using the Gravity Model
Table 2 Recent Ex Ante Studies of RTAs Using the CGE Model
Table 3 Lewis, Robinson & Thierfelder (1999): Macro and Trade Performance Results for two Agreements: a) EU-South Africa & SADC (bilateral FTA); b) EU & South Africa & Other Southern Africa (trilateral FTA)
Figure 1. Intra-Regional Exports, 1990 and 1999
As a Share of Total Exports (%)

Source: WTO
Table 1. Recent Ex Post Studies of RTAs Using the Gravity Model

<table>
<thead>
<tr>
<th>Study investigators</th>
<th>Study description, time period</th>
<th>Agreement</th>
<th>Intra-regional Change in trade flows</th>
<th>Extra-regional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frankel (1997)</td>
<td>Gravity model with dummy variables for intra-bloc and extra-bloc trade. 1965-1992.</td>
<td>EC/EU</td>
<td>The effect is generally insignificant and attains a positive and significant level only in 1985 and 1990 (e.g. in 1990 trade increased by a third)</td>
<td>In specific tests of the expansion of the EC from 6 to 9 and from 9 to 12 the effect is negative and significant (trade was one tenth and one quarter lower than expected by the gravity determinants, respectively)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFTA</td>
<td>The effect is insignificant</td>
<td>The effect is negative and generally significant (e.g. in 1990 trade was almost half than expected by the gravity determinants)</td>
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<td></td>
<td></td>
<td>CUFTA</td>
<td>The effect is insignificant</td>
<td>n.a.</td>
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<td>MERCOSUR</td>
<td>The effect is positive and significant (e.g. in 1992 trade has more than doubled)</td>
<td>The effect is positive and significant from 1985 (e.g. in 1990 trade more than doubled)</td>
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<td></td>
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<td>ASEAN</td>
<td>The effect is positive and significant (e.g. in 1992 trade increased by an estimated fivefold)</td>
<td>The effect is positive and significant (e.g. in 1990 trade has almost doubled)</td>
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</tbody>
</table>
Table 1 (continued)

<table>
<thead>
<tr>
<th>Study investigators</th>
<th>Study description, time period</th>
<th>Agreement</th>
<th>Change in trade flows</th>
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</thead>
<tbody>
<tr>
<td>Soloaga &amp; Winters (1999)</td>
<td>Gravity model with dummy variables that capture (i) intra-bloc trade (ii) imports by members from all countries, and (iii) exports by members from all countries. 1980-1996.</td>
<td>EU</td>
<td>The effect is generally negative and has a positive and significant trend only from 1985 (e.g. in 1995 trade was still more than half than predicted by the gravity determinants)</td>
</tr>
<tr>
<td>EFTA</td>
<td>The effect is insignificant</td>
<td>The effect was relatively high in 1980, and fell over the period (e.g. between 1980 and 1995 exports contracted by two and half times)</td>
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<tr>
<td>NAFTA</td>
<td>The effect is insignificant</td>
<td>The effect fell over the period (e.g. between 1980 and 1995 exports fell by three quarters)</td>
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<tr>
<td>Study investigators</td>
<td>Study description, time period</td>
<td>Agreement</td>
<td>Change in trade flows</td>
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<tr>
<td>Soloaga &amp; Winters (1999) (continued)</td>
<td></td>
<td>MERCOSUR</td>
<td>The effect is positive and significant (e.g. in 1995, trade was eight times as high as it would have been without the RTA)</td>
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<td></td>
<td></td>
<td>ASEAN</td>
<td>The effect is generally negative, especially between 1987 and 1995</td>
</tr>
<tr>
<td>Bayoumi &amp; Eichengreen (1995)</td>
<td>Gravity model with dummy variables for intra-bloc trade and extra-bloc trade (industrialised countries other than EFTA countries). 1956-73.</td>
<td>EC</td>
<td>The effect is positive and becomes significant during 1965-70 (trade increases by 3.2 % per annum)</td>
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<tr>
<td>Study investigators</td>
<td>Study description, time period</td>
<td>Agreement</td>
<td>Change in trade flows</td>
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<tr>
<td>Krueger (1999)</td>
<td>Gravity model with dummy variables for intra-bloc trade and extra-bloc imports. 1987-1997.</td>
<td>NAFTA</td>
<td>The effect is insignificant</td>
</tr>
<tr>
<td>Wang (1992)</td>
<td>Gravity model with dummy variable representing preferences of two countries in the same RTA. 1984-86.</td>
<td>ASEAN</td>
<td>The effect is positive and significant (e.g. trade increased an estimated sixfold)</td>
</tr>
</tbody>
</table>
Table 1. (continued)

<table>
<thead>
<tr>
<th>Study investigators</th>
<th>Study description, time period</th>
<th>Agreement</th>
<th>Change in trade flows</th>
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<td></td>
<td>Intra-regional</td>
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<tr>
<td>Winters &amp; Wang (1994)</td>
<td>Gravity model with dummy variable representing preferences of two countries in the same RTA. 1984-86.</td>
<td>ASEAN</td>
<td>The effect is positive and significant (e.g. trade increased an estimated tenfold)</td>
</tr>
<tr>
<td>Elbadawi (1997)</td>
<td>Gravity model with dummy variables for intra-bloc trade and extra-bloc trade. In addition, specific test for incremental trade creation/diversion effect of RTA after controlling for exchange rate effect. 1980-1990.</td>
<td>SADCC</td>
<td>The effect is negative and insignificant</td>
</tr>
<tr>
<td>OECD (2001)</td>
<td>Gravity model, with dummy variables for intra-bloc trade and extra-bloc trade. Other 'non-traditional' variables are included such as infrastructure and political variables. 1980-1997.</td>
<td>SADCC</td>
<td>The effect is negative</td>
</tr>
</tbody>
</table>

Note: A positive and significant intra-regional trade effect means that the RTA has expanded trade among its members (trade creation). A negative or insignificant effect for intra-regional trade means that the RTA has not expanded trade among its members. A positive and significant effect for extra-regional trade means that the RTA has expanded trade between its members and the rest of the world (trade creation). A negative and significant effect for extra-regional trade or a fall of this effect during the period means that the RTA has reduced trade between its members and the rest of the world (trade diversion).
<table>
<thead>
<tr>
<th>Study investigators</th>
<th>Study description, base year</th>
<th>Sectors</th>
<th>Countries</th>
<th>Change in trade flows (US$ mil)</th>
<th>Change in economic welfare (as % of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasiorek, Smith &amp; Venables – GSV (1992)</td>
<td>Ex ante study using a computable general equilibrium (CGE) model of imperfect competition with differentiated products, increasing returns to scale, and inter-industry flows.</td>
<td>13 manufacturing goods sectors, plus 2 non-manufacturing sectors</td>
<td>EC</td>
<td>n.a. (positive)</td>
<td>1.35</td>
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<td>France</td>
<td>n.a</td>
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<td>Germany</td>
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<td>EC North</td>
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<td>Greece, Ireland</td>
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<td>Iberia</td>
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<td>Rest of the World</td>
<td>n.a</td>
<td>n.a</td>
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<td>Haarland &amp; Norman (1992)</td>
<td>Ex ante study using a CGE model similar to the GSV (1992) model of imperfect competition with differentiated products, increasing returns to scale, and inter-industry flows.</td>
<td>12 manufacturing sectors, plus 1 non-traded goods sector</td>
<td>EC</td>
<td>n.a</td>
<td>0.48</td>
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<td></td>
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<td>EFTA</td>
<td>n.a</td>
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<td>USA</td>
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<td>Japan</td>
<td>n.a</td>
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<td>Harrison, Rutherford &amp; Tarr – HRT (1994)</td>
<td>Ex ante study using a CGE model of imperfect competition with differentiated products, increasing returns to scale and inter-industry flows.</td>
<td>26 sectors, 12 of which are manufacturing sectors. Primary production factors, including capital and different types of labour, are mobile across sectors domestically but internationally immobile.</td>
<td>EC</td>
<td>n.a</td>
<td>1.18</td>
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<td>Belgium</td>
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<td>Rest of the World</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>Study investigators</td>
<td>Study description, base year</td>
<td>Sectors</td>
<td>Countries</td>
<td>Change in trade flows (US$ mil)</td>
<td>Change in economic welfare (as % of GDP)</td>
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<td></td>
<td>Exports (Extra-Bloc)</td>
<td>Imports (Extra-Bloc)</td>
</tr>
<tr>
<td>Bachrach &amp; Mizrahi (1992)</td>
<td>Ex ante study using CGE models of perfect competition for Mexico and USA with differentiated products, constant returns to scale and inter-industry flows. 1988.</td>
<td>36 traded goods sectors, plus 8 services sectors. Primary factors of production include capital, labour and energy resources. 1988.</td>
<td>NAFTA Canada Mexico United States Rest of the World</td>
<td>2,401 (190)</td>
<td>1,294 (-81)</td>
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<td>n.a.</td>
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<td>546 (-21)</td>
<td>1,149 (45)</td>
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<td>1,855 (211)</td>
<td>145 (-126)</td>
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<td></td>
<td>n.a.</td>
<td>n.a.</td>
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<tr>
<td>Brown, Deardorff &amp; Stern (1992)</td>
<td>Ex ante study using a CGE model of imperfect competition with differentiated products, increasing returns to scale and inter-industry flows. 1989.</td>
<td>23 traded goods sectors and 6 non-traded goods sectors. Capital and labour are perfectly mobile between sectors but internationally immobile. 1989.</td>
<td>NAFTA Canada Mexico United States Rest of the World</td>
<td>17,688 (n.a.)</td>
<td>17,864 (n.a.)</td>
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<tr>
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<td>6,108 (n.a)</td>
<td>5,537 (n.a.)</td>
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<td></td>
<td>2,984 (n.a)</td>
<td>2,952 (n.a)</td>
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<td></td>
<td></td>
<td>8,596 (n.a)</td>
<td>9375 (n.a)</td>
</tr>
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<td></td>
<td></td>
<td>476</td>
<td>-830</td>
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<td></td>
<td></td>
<td>46,439 (956)</td>
<td>27,565 (3,016)</td>
</tr>
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<td></td>
<td></td>
<td>3,472 (1,097)</td>
<td>5,731 (758)</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td>33,629 (4,355)</td>
<td>40,543 (-3,752)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Study investigators</td>
<td>Study description, base year</td>
<td>Sectors</td>
<td>Countries</td>
<td>Change in trade flows (US$ mil)</td>
<td>Change in economic welfare (as % of GDP)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
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<tr>
<td>Flores (1997)</td>
<td>Ex ante study using a CGE model of imperfect competition with differentiated products, increasing returns to scale and inter-industry flows patterned after GSV (1992), 1990.</td>
<td>9 sectors with 5 sectors identified as imperfectly competing. Capital is mobile domestically and within Mercosur.</td>
<td>Mercosur Argentina Brazil Uruguay Rest of the World</td>
<td>184 (81) 105 (2)</td>
<td>n.a. 1.80 1.10 2.30 n.a.</td>
</tr>
<tr>
<td>Hinosjosa-Ojeda, Lewis &amp; Robinson (1997)</td>
<td>Ex ante study using a CGE model of perfect competition with differentiated products, constant returns to scale, inter-industry flows and labour migration. 1990.</td>
<td>11 sectors, including a services sector. Capital, land, and 4 types of labour are domestically mobile. Unskilled labour is mobile between Mexico and U.S.</td>
<td>Mercosur Brazil Argentina NAFTA Mexico U.S. Chile Rest of the World</td>
<td>1,390 (580) 890 (380) 500 (200) 0 (0) 0 (0) 0</td>
<td>630 0.10 0.11 0.00 0.00 n.a.</td>
</tr>
<tr>
<td>DeRosa (1995)</td>
<td>Ex ante study using a CGE model of perfect competition with differentiated products, constant returns to scale and inter-industry flows. 1988.</td>
<td>27 sectors including a non-traded sector. Capital is specific to individual sectors, while labour is mobile between sectors. All primary factors are internationally immobile.</td>
<td>ASEAN Indonesia Malaysia Philippines Singapore Thailand Rest of the World</td>
<td>2,446 (-229) 342 (77) 536 (-135) 171 (37) 993 (-314) 405 (106)</td>
<td>n.a. 0.23 1.30 0.41 3.86 0.56 n.a.</td>
</tr>
<tr>
<td>Study investigators</td>
<td>Study description, base year</td>
<td>Sectors</td>
<td>Countries</td>
<td>Change in trade flows (US$ mil)</td>
<td>Change in economic welfare (as % of GDP)</td>
</tr>
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<tr>
<td>Lewis &amp; Robinson (1996)</td>
<td>Ex ante study using a CGE model of perfect competition with differentiated product, constant returns to scale, and inter-industry flows. 1992.</td>
<td>12 sectors, including one services sector. Primary factors (capital, land, and two types of labour) are domestically mobile between sectors but internationally immobile.</td>
<td>ASEAN, Indonesia, Malay &amp; Sing., Philippines, Thailand, China, Korea &amp; Taiwan, Japan, United States, European Union</td>
<td>Exports (Extra-Bloc): 1,080 (n.a.), 140 (n.a.), 60 (n.a.), 290 (n.a.), 590 (n.a.), -10, -20, 20, 20. Imports (Extra-Bloc): 1,080 (n.a.), 140 (n.a.), 60 (n.a.), 290 (n.a.), 590 (n.a.), -10, -20, 20, 20.</td>
<td>-10, 0, -20, 0, 0, -0.01, 0.00, 0.00, 0.00.</td>
</tr>
</tbody>
</table>

Source: DeRosa (1998)
### Table 3. Lewis, Robinson & Thierfelder (1999): Macro and Trade Performance Results for two Agreements: a) EU-South Africa & SADC (bilateral FTA); b) EU & South Africa & Other Southern Africa (trilateral FTA)

<table>
<thead>
<tr>
<th>Study investigators</th>
<th>Study description, base year</th>
<th>Sectors</th>
<th>Agreement</th>
<th>Regions</th>
<th>Change in trade flows (US$ bn)</th>
<th>Change in economic welfare (as a % of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewis, Robinson &amp; Thierfelder (1999)</td>
<td>Ex ante study using a computable general equilibrium (CGE) model of perfect competition with differentiated products, constant returns to scale, and inter-industry flows. 1995.</td>
<td>17 sectors, of which 6 manufacturing goods sectors.</td>
<td>a) EU-South Africa &amp; SADC (bilateral FTA)</td>
<td>EU</td>
<td>0.608</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High income Asia</td>
<td>-0.020</td>
<td>-0.001</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Low income Asia</td>
<td>0.000</td>
<td>-0.006</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>North America</td>
<td>0.010</td>
<td>-0.007</td>
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<td></td>
<td></td>
<td></td>
<td>Rest of Southern Africa</td>
<td>0.049</td>
<td>0.002</td>
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<td></td>
<td></td>
<td></td>
<td>Rest of sub-Saharan Africa</td>
<td>0.001</td>
<td>-0.001</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>South Africa</td>
<td>0.668</td>
<td>0.012</td>
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<td></td>
<td></td>
<td></td>
<td>Rest of World</td>
<td>0.034</td>
<td>-0.010</td>
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<td></td>
<td></td>
<td></td>
<td>b) EU &amp; South Africa &amp; Other Southern Africa (trilateral FTA)</td>
<td>EU</td>
<td>1.287</td>
<td>0.107</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>High income Asia</td>
<td>0.005</td>
<td>0.040</td>
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</tr>
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<td></td>
<td></td>
<td>Low income Asia</td>
<td>0.074</td>
<td>0.021</td>
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<td></td>
<td></td>
<td>North America</td>
<td>0.006</td>
<td>0.026</td>
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<td></td>
<td>Rest of Southern Africa</td>
<td>1.181</td>
<td>-0.001</td>
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<td></td>
<td>Rest of sub-Saharan Africa</td>
<td>0.005</td>
<td>0.004</td>
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<td></td>
<td></td>
<td>South Africa</td>
<td>0.840</td>
<td>0.011</td>
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<td></td>
<td>Rest of World</td>
<td>0.027</td>
<td>0.036</td>
<td></td>
</tr>
</tbody>
</table>

Source: Lewis, Robinson & Thierfelder (1999)
References


