OECD *Economic Studies* No. 36, 2003/1

THE INFLUENCE OF POLICIES ON TRADE AND FOREIGN DIRECT INVESTMENT

Giuseppe Nicoletti, Stephen S. Golub, Dana Hajkova, Daniel Mirza and Kwang-Yeol Yoo

TABLE OF CONTENTS

Introduction 8
Recent trends in trade, FDI and the internationalisation of production 9
Trends in FDI 10
Trade developments: goods and services 17
Twin developments in FDI and trade 22
Policy and other determinants of trade and international investment 24
Openness 24
Product-market regulation 33
Labour-market arrangements 37
Infrastructure 38
Geographical and economic factors 40
Empirical evidence 41
Approach 42
Non-policy-related structural factors impinging on trade and FDI 44
The direct and indirect influence of policies 48
Summing up 58
How do policies shape trade and FDI patterns? 59
Accounting for cross-country patterns of trade and FDI 60
The impact of removing impediments to trade and FDI 64
Summary and conclusions 70
Openness: formal trade and FDI restrictions 70
Product-market reforms 71
Labour-market reforms 72
Infrastructure 72
Bibliography 79

Giuseppe Nicoletti, Dana Hajkova and Kwang-Yeol Yoo work in the OECD Economics Department; Steve Golub and Daniel Mirza are, respectively, Professor of Economics at Swarthmore College (United States) and Research Fellow at the University of Nottingham (United Kingdom), and were consultants to the OECD Economics Department when this paper was written. The authors wish to thank Sveinbjörn Blöndal, Jørgen Elmeskov, Michael Feiner, Nigel Pain and the many colleagues in the OECD Economics Department and other OECD Directorates who contributed to improve this paper with their useful comments. Martine Levasseur and Janice Gabela provided excellent statistical and editorial assistance. The opinions expressed are personal and do not engage the OECD or its member countries.

© OECD 2003

INTRODUCTION

The beneficial effects of foreign trade and foreign direct investment (FDI) on efficiency and growth are generally recognised, and there is a wide consensus that policy should aim at reducing or eliminating hindrances to global trade and FDI integration. Successive multilateral trade rounds, regional trade agreements and bilateral and multilateral investment accords have reduced formal barriers to trade and FDI. The current World Trade Organization (WTO) trade negotiations aim at continuing this trend. However, border barriers are still significant in some countries and industries, in particular in the form of restrictions to FDI. Moreover, there is growing recognition that policies aimed at non-border-related objectives may have a significant impact on the extent of trade and activities of multinational enterprises (MNEs). Thus, unnecessarily restrictive product and labour-market regulations can act as barriers to trade and FDI. The state of the domestic physical infrastructure can also influence countries' capacities to participate in the globalisation of economic activity.

This paper assesses the importance of certain border and non-border policy measures for global economic integration. A number of studies have looked at the influence of economic and/or policy factors on trade and FDI, but most of them tended to deal mainly with geographical and structural factors or focus on a small subset of policy variables (*e.g.* border variables). Building on previous OECD work, this paper takes into account a much broader set of policy variables, including product and labour-market regulation as well as openness to FDI and infrastructure supply. In addition, it looks at both FDI and trade, in a framework in which these two dimensions of global integration respond to similar structural and policy factors. The analysis covers FDI and trade in both goods and services, thus aiming to account for the most important channels of globalisation and dealing with most modes of cross-border service supply.[1] The aim of the paper is threefold:

- First, it describes trends in goods trade, services trade and FDI, as well as border and non-border policies that are likely to affect them. To this end, a large set of policy indicators constructed by the OECD is used, including the new summary indicators for FDI-specific regulations described in Golub (2003). Indicators of tariffs, non-tariff barriers and participation in free trade areas are also used to gauge the stance of policy toward trade openness.[2]

© OECD 2003

- Second, the paper estimates the impact of these policies on trade and FDI in a framework in which trade flows and the activity of MNEs are seen to be determined jointly and respond to the same market and policy influences.[3] The empirical analysis focuses on bilateral trade and FDI patterns, including bilateral trade in services, but also looks at the determinants of multilateral inward FDI to explain the overall ability of individual OECD countries to attract international investment.
- Third, using the results of the empirical analysis, the paper discusses and quantifies the effects on global integration of policies targeted at removing border and non-border barriers and levelling the playing field for FDI in the OECD area. In this context, the focus is on four widely-advocated policies: removing explicit restrictions to trade and FDI; promoting domestic competition; improving the adaptability of labour markets; and ensuring adequate levels of infrastructure capital. It should be noted at the outset that the results of the simulations are only suggestive of what could happen under different policy scenarios, notably because the empirically-estimated models on which they are based are partial equilibrium, reduced-form models that are unable to account for the general equilibrium interactions between policy changes and trade and FDI flows. Notably, to the extent that diversion effects are important, the simulation results may overestimate the effects of policy changes on the variables of interest.

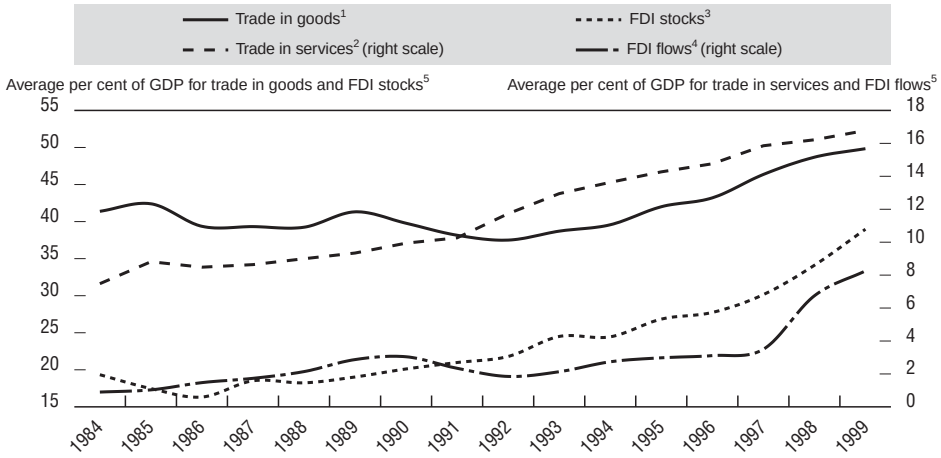
The paper is structured as follows. The next section documents recent trends in foreign trade and internationalisation of production. The following sections, respectively: discuss the main factors that are likely to jointly affect trade and FDI patterns in OECD countries, focusing on the role of policy; present econometric evidence on the impact of these factors on trade and FDI; use the results of this analysis to perform policy simulations; and conclude. Details about empirical results (including their sensitivity to changes in empirical specifications) and the construction of the underlying data sets can be found in Nicoletti *et al.* (2003).

RECENT TRENDS IN TRADE, FDI AND THE INTERNATIONALISATION OF PRODUCTION

Focusing on the OECD area, Figure 1 depicts stylised facts on what is commonly called "globalisation". Over the past decade, both the trade intensity (defined as the sum of exports and imports over GDP) and the foreign investment intensity (defined as the sum of outward and inward FDI positions over GDP) have increased significantly in the average OECD country.[4] The upward trend was particularly pronounced since the early 1990s for FDI and trade in goods, which remained significantly more intense than services trade. The aim of this section is

© OECD 2003

Figure 1. **Trade and FDI patterns in the OECD**



1. Trade in goods is defined as the sum of exports and imports of goods realised between a reporting country and the OECD area.
2. Trade in services is defined as the sum of exports and imports of services realised between a reporting country and the world (due to the lack of OECD-specific data, services trade cannot be defined relative to the OECD area).
3. FDI stock is the sum of inward and outward positions of the average country in the OECD area.
4. FDI flows are the sum of yearly investment inflows and outflows of the average country to the OECD area.
5. Simple average of the ratios of OECD countries.

Source: OECD.

to illustrate the main cross-country and cross-industry features of these trends and highlight some of the questions that need to be addressed to understand the economic factors that underlie these phenomena as well as the role that policy can play in favouring the trend towards OECD-wide integration.

Trends in FDI

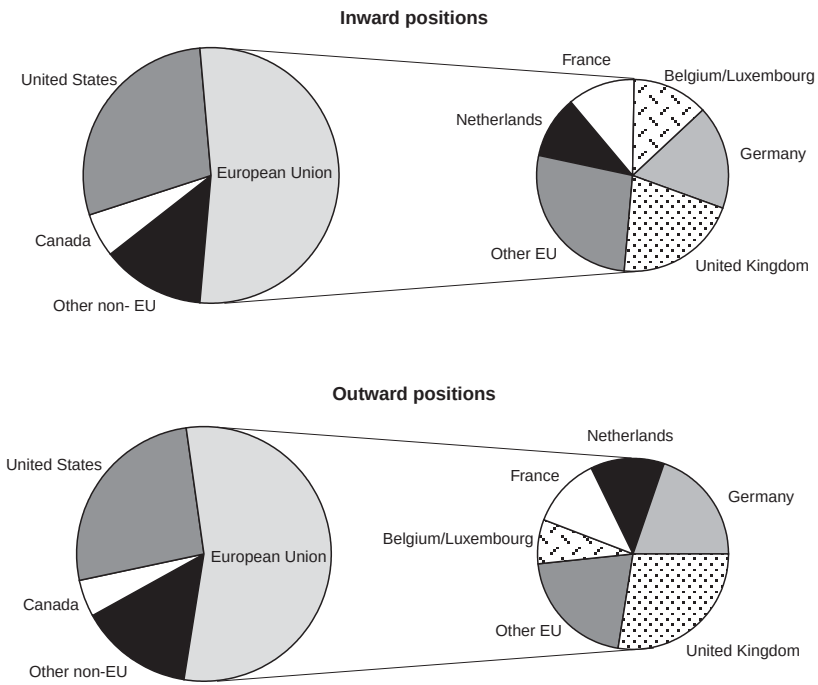
Most global international investment activity goes on among OECD countries and takes the form of ownership changes in existing enterprises (mergers and acquisitions, privatisation), with so-called "green-field" investment playing only a minor role (OECD, 2002).[5] While different forms of FDI might respond to policies differently, the empirical analysis of the paper is based on aggregate financial FDI data since the identification of the different forms of FDI is not possible for many OECD countries. In 1999, the OECD accounted for around 91 per cent of world investment outflows and 74 per cent of world inflows (UNCTAD, 2001). Over the same period, EU countries combined were both the largest recipients and the

© OECD 2003

largest suppliers of FDI in the OECD area, followed by the United States, Japan, Canada and Switzerland (Figure 2).

The average share of FDI inflows in total business investment went from little more than 3 per cent over the 1980s to almost 11 per cent in the 1990s, bringing about a significant increase in the outward and inward positions of most OECD countries. Given the way these data are constructed (Box 1), part of this increase may be due to a revaluation of existing positions reflecting the sharp increase in equity prices over the same period (OECD, 2002c). Nonetheless, the upward trend in FDI flows points to a rising internationalisation of production over the 1990s. FDI activity dropped sharply in recent years, but most observers attribute the decline to transitory causes rather than to a reversal of the earlier decade-long upward trend.[6]

Figure 2. **Distribution of OECD FDI positions in 1998**[1]



1. The charts are based on bilateral data. As the method used for valuing FDI positions varies across countries, the resulting shares are undervalued for countries that report book values (*e.g.* the United States).

Source: OECD.

© OECD 2003

Box 1. **Trade and FDI data**

Foreign direct investment

Foreign direct investment is a category of international investment made by a resident entity in one country (direct investor) with the objective of establishing a lasting interest in an enterprise resident in another country (direct investment enterprise).[1] This involves both the initial transaction between the two entities and all subsequent capital transactions between them and among affiliated enterprises, both incorporated and unincorporated.

Conventionally, a foreign direct investment enterprise is an incorporated enterprise in which a foreign investor owns 10 percentage or more of the ordinary shares or voting power or an unincorporated enterprise in which a foreign investor has equivalent ownership. Financial FDI data may be geographically biased to the extent that MNEs use strategically-located holding companies to intermediate their investments.

Statistics on FDI transactions and positions are based on the OECD database developed by the Directorate for Financial, Fiscal and Enterprise Affairs (published under the title *International Direct Investment Statistics Yearbook*). These statistics are compiled according to the concepts used for balance of payments (flows) and international investment position (stocks) statistics. Both data sets are available for inward and outward investment with further breakdowns *i*) by partner country and *ii*) by economic sector (according to ISIC Rev. 3 classifications).

Generally, information on inward flows and stocks and on outward flows and stocks is available. The data set used in the empirical analysis covers 28 OECD countries (Luxembourg and Belgium report together; data for Slovakia are not included) over the 1980-2000 period and hence comprises 756 country-partner pairs per year for a potential of 15 876 observations. However, some countries are not yet able to provide complete sets of statistics and, therefore, the panel is unbalanced.[2] An attempt has been made to restore some of the missing data by using available antipodal bilateral data.

Substantial progress has been made towards the agreed international standards for FDI data compilation established by the IMF and the OECD. However, some OECD countries still deviate from the standards in terms of, for instance, the elements included in the disseminated data (income on equity, reinvested earnings and income on debt), the treatment of indirectly-owned investment enterprises or, to a minor extent, definitions used to identify direct investment enterprises resident in the reporting country. The majority of countries report data on investment positions based on book values, but some measure the positions in market values. These issues make the cross-sectional comparability of the data somewhat problematic.

Foreign trade

Information on international trade has been collected from three sources. Data on trade in goods come from the OECD publication *International Trade by Commodity*

© OECD 2003

Box 1. **Trade and FDI data** (*cont.*)

Statistics and match the same format as the financial FDI data, *i.e.* 28 countries and partners during the period 1980-2000. Information on trade in services with partner disaggregation has been taken from the OECD *Statistics on International Trade in Services* 1999-2000. Information is available for two years only, the data covering 20 countries and 27 partners.[3] Data on trade in services by sector (bilateral information is not available) are based on the OECD *Statistics on International Trade in Services* 1990-1999. These data have been so far used for descriptive purposes only.

1. "Lasting interest" implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the direct investment enterprise.
2. For the period 1980-2000, no geographic breakdown is available for the stock data for the Belgium-Luxembourg Economic Union, Spain, Ireland and Turkey; for outward stocks for Hungary and Mexico; and for outflows for Greece and Mexico.
3. Balance of payments statistics on services cover cross-border supply (*e.g.* freight and communications) and consumption abroad (*e.g.* tourism). They exclude the exchange of services that take place through commercial presence (*i.e.* the activity of foreign affiliates) and movement of individuals (*i.e.* temporary presence of service suppliers).

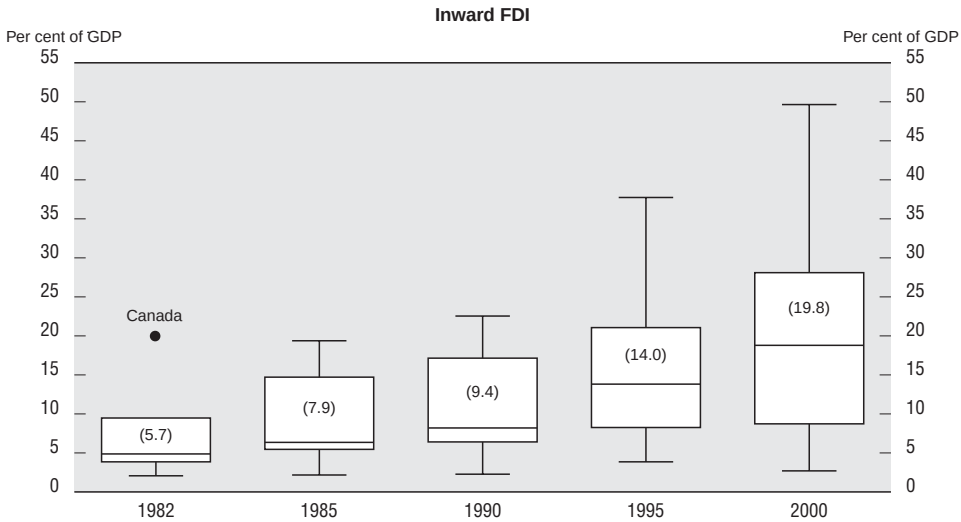
The general move towards internationalisation has been matched by an increasing cross-country dispersion of the amount of FDI supplied and hosted relative to the size of the investor and host countries (Figure 3). By the year 2000, the variances of the instock and outstock as ratios to GDP among OECD countries were larger than two decades earlier, though less so for outstocks. Figure 3 also shows that a number of host countries have relatively large instock ratios, while outstock ratios tend to be more evenly distributed across investor countries. Focusing on inward FDI positions, Figure 4 shows the average instock to GDP ratios of individual countries in the 1980s and 1990s. It suggests that the largest contribution to the increase in the cross-country dispersion of the OECD instock was provided by Ireland, Belgium and the transition countries, in which inward FDI surged during the 1990s.

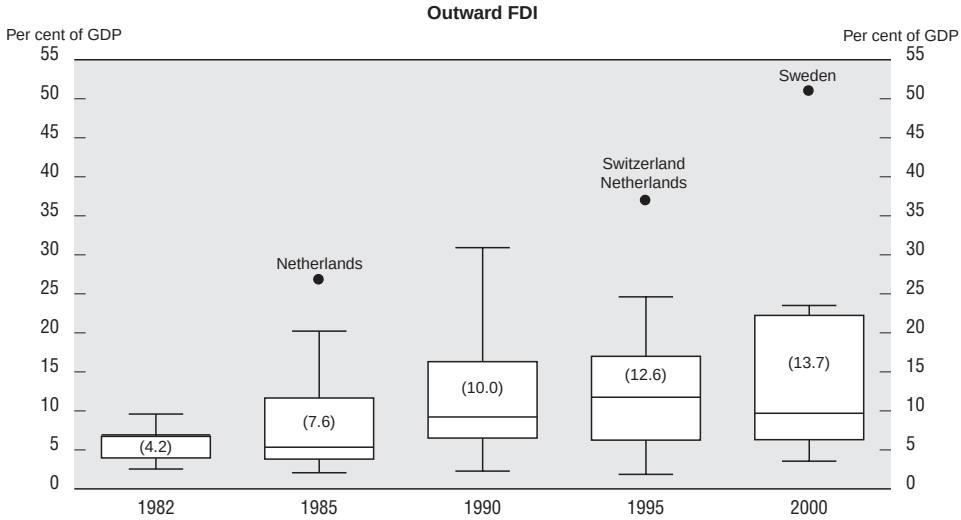
The variance of the multilateral measures masks very different cross-country patterns at the bilateral level. First, in 1998 (the latest year for which bilateral data are reasonably complete) the number of host partners varied across investing countries, ranging from below 10 for Hungary and Turkey to above 20 for many EU countries, the United States and Canada. Second, the extent to which countries

© OECD 2003

Figure 3. **Inward and outward FDI positions: trends and cross-country dispersion**[1]

Unweighted OECD average position[2]



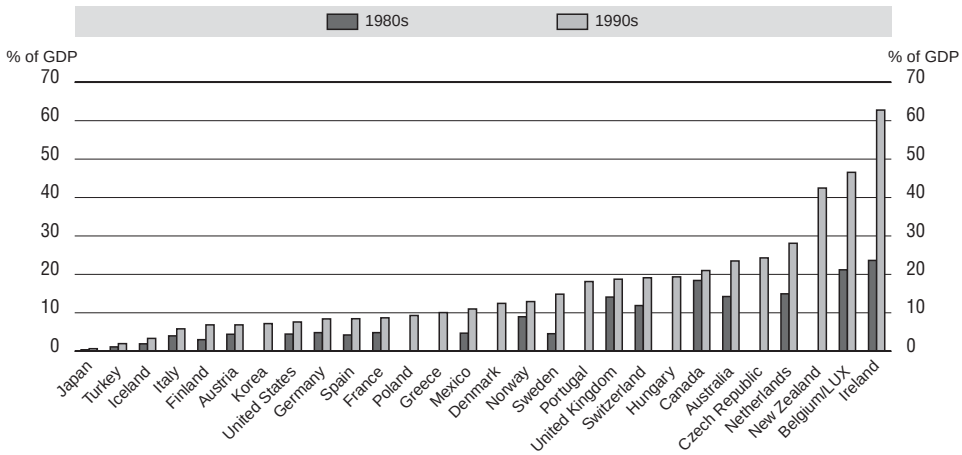


1. The box plot shows, in each year, the median OECD value of the inward or outward stock of FDI (the horizontal line in the box), the third and second quartiles of the cross-country distribution (the edges of each box) and the extreme values (the two whiskers extending from the box). Dots identify outlier observations.
2. Data in parentheses are unweighted average GDP ratios.

Source: OECD.

© OECD 2003

Figure 4. **Inward FDI positions in OECD countries, 1980s and 1990s**[1]



1. Average values over the two periods. For countries where FDI position data are not available, values of bilateral stocks reported by their OECD partners were summed up to obtain an approximate measure of multilateral FDI stocks.

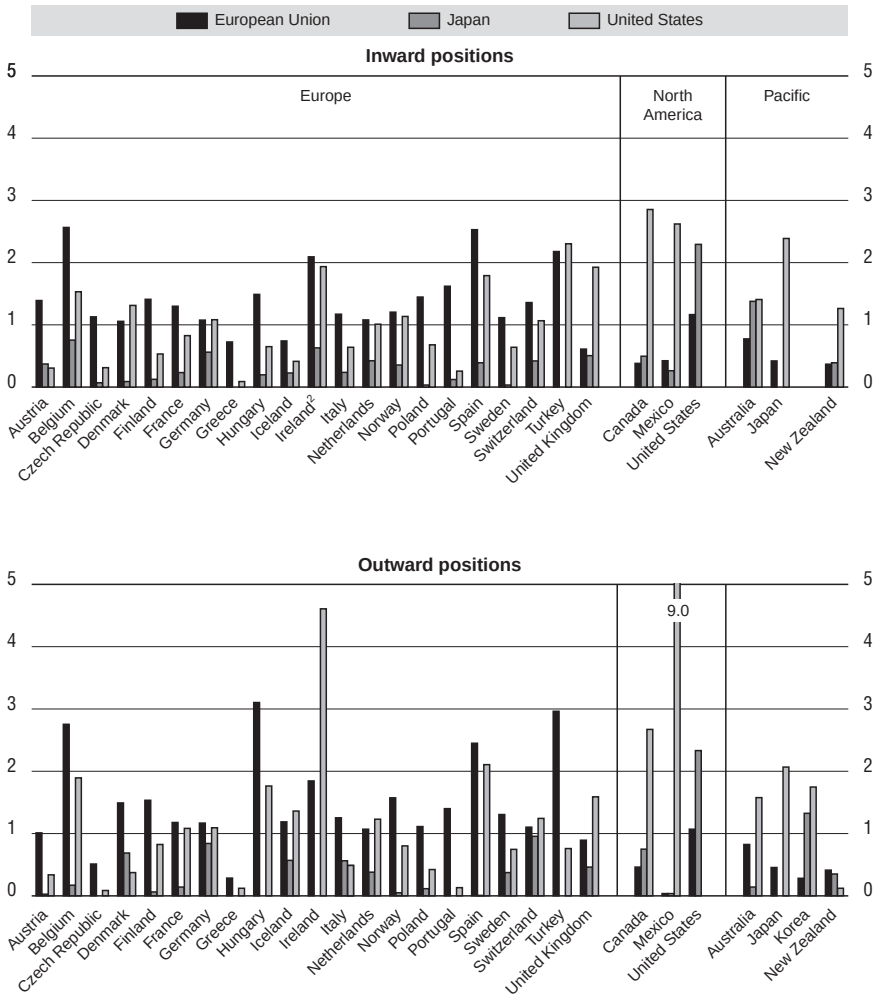
Source: OECD.

geographically specialise their FDI across a given number of partners also differs. While many countries tend to evenly distribute their FDI across partners, some of them (*e.g.* Canada, Korea, Denmark and the United Kingdom) tend to concentrate FDI on a few host countries. Similarly, some countries (Austria, Canada, the United Kingdom and Mexico) mostly host FDI originating from just a few countries.

The indicators depicted in Figure 5 report patterns of geographical specialisation focusing on inward (and outward) FDI from (to) the European Union, the United States and Japan – where specialisation is defined in terms of a country hosting (supplying) a share of FDI from an investor country (to a host country) larger than the share hosted (supplied) by the OECD. Geographical factors are clearly important in explaining patterns of FDI instocks (Panel A): most European countries specialise in hosting FDI originating from EU countries; Canada, Mexico and Ireland specialise in hosting FDI from the United States; and Pacific shore countries specialise in hosting FDI from the United States and/or Japan. Interestingly, however, the degree of geographical specialisation varies significantly both within the same area and relative to countries located outside the area. On the whole, the dispersion of specialisation patterns suggests that geographical factors are important, but they cannot explain the entire variability in the data.[7]

© OECD 2003

Figure 5. **Patterns of geographical specialisation in inward and outward FDI**[1]
Average 1995-1998



1. Inward geographical specialisation is defined as the revealed tendency of a country to host a share of FDI from an investor country (European Union, Japan, United States), which is larger than the share hosted by the OECD as a whole. Outward geographical specialisation is defined as the revealed tendency of a country to invest a share of FDI in a host country (European Union, Japan, United States) which is larger than the share invested by the OECD as a whole. A country is "geographically specialised" in investing to (or in hosting from) another country if the indicator is above unity. For computational details, see Annex.
2. Data for FDI from Japan are for 1991-1994.

Source: OECD.

© OECD 2003

Trade developments: goods and services

As pointed out in Figure 1, both goods and services trade flows rose faster than GDP over the past decade in the OECD area. At the same time, the intensity of trade in services remained much lower than in goods. Underlying these OECD-wide stylised facts are wide cross-country differences in export and import intensities and in the geographical specialisation of the exports of individual OECD countries.

Goods trade

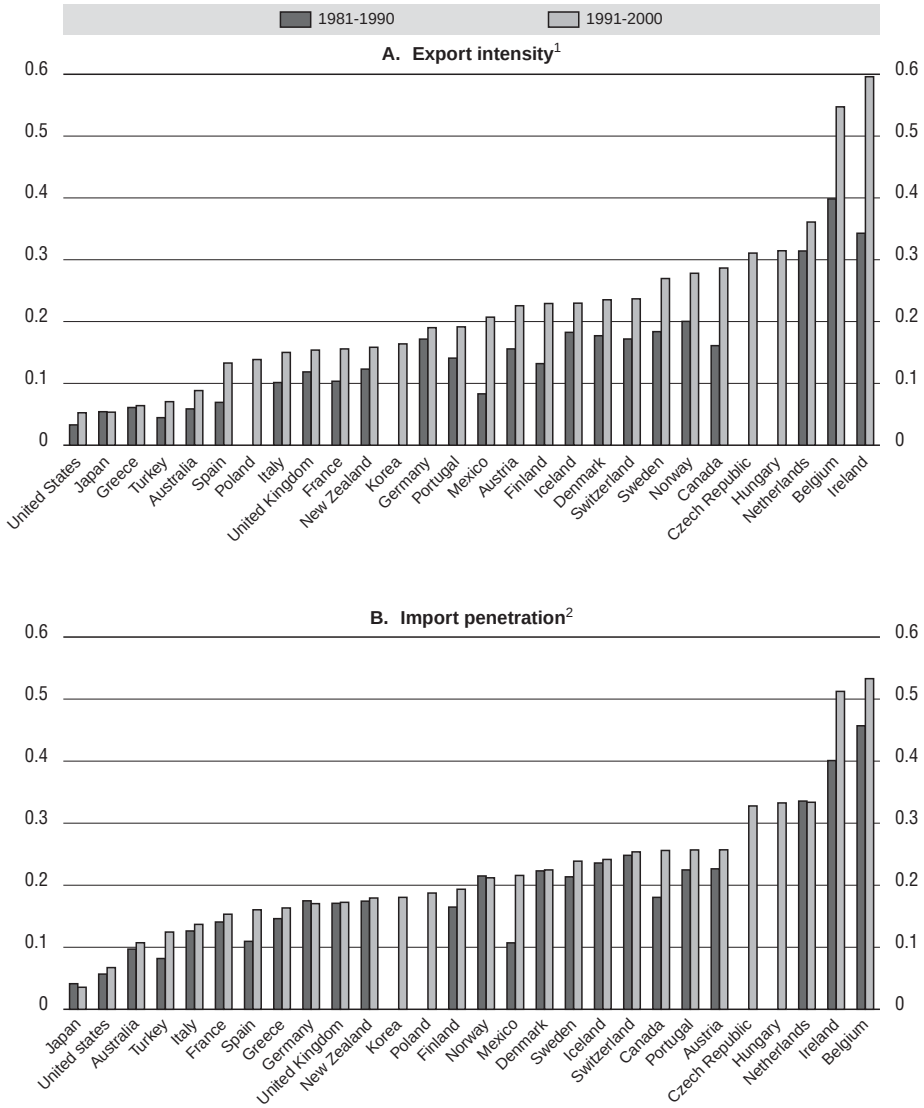
Figure 6 shows average intensities of goods trade within the OECD area for individual member countries over the 1980s and the 1990s. The intensity of exports to OECD countries (defined as the share of exports in GDP) increased in all countries except Japan,[8] partly reflecting a stronger propensity of the Japanese economy to export to non-member Asian countries over the past decade (Panel A). The increase was particularly noticeable in Ireland and Mexico, which almost doubled their OECD export intensity between the two periods, but significant increases also took place in Canada and the northern European countries. It is also known that the increase in OECD export intensities over the 1990s has been marked for transition member countries.

The increase in trade intensities over the past two decades has probably been matched by rising intra-firm trade related to the widening role played by MNEs in the OECD area (OECD, 2002d). Indirect evidence of this is provided by the rising share of intra-industry trade, especially in transition countries, which parallels the sharp increase in FDI inflows over the same period. Direct measures of intra-firm trade, which are available for only a few countries (notably the United States, Japan and some Nordic countries), also point in this direction. The available data suggest that intra-firm trade among MNEs and foreign affiliates located in high-income OECD countries mainly involved the export of final goods for sale in local markets, reflecting horizontal-type FDI, while trade between MNEs located in high-income countries and their affiliates in middle-income OECD countries also involves imports of intermediate goods to be further manufactured and sold in the country of the parent company (or other countries), reflecting vertical-type FDI.

A cursory view at Figure 6 also suggests that both the location and the size of the countries are important factors determining the propensity to trade. For instance, economies that are large, such as Japan and the United States, or geographically remote relative to major OECD markets, such as Australia, have relatively low trade intensities, reflecting either a wide internal market or high transport costs. By contrast, economies that are small and well-connected to large

© OECD 2003

Figure 6. **Intensity of goods trade within the OECD area, 1980s and 1990s**



1. Export intensity is defined as the ratio of exports to GDP.
2. Import penetration is defined as the rati of imports to domestic absorption.

Source: OECD.

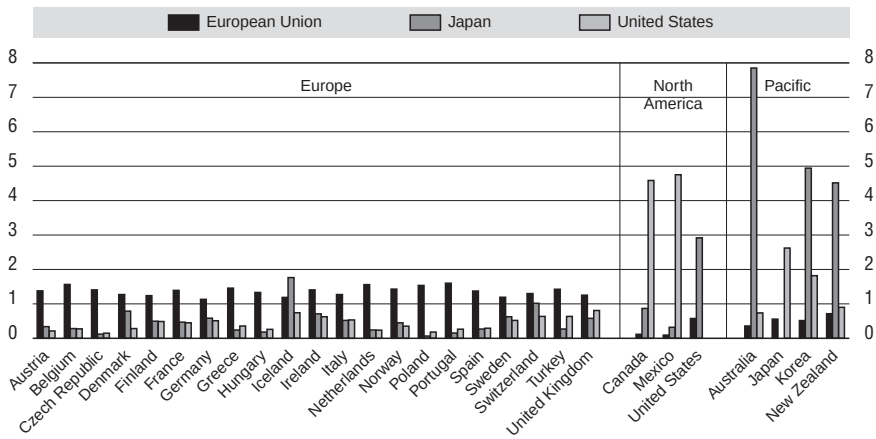
© OECD 2003

neighbouring countries, such as Belgium and the Netherlands, have high trade intensities. However, location and size cannot fully explain the cross-country patterns of export intensities, because there are small countries with low intensities, such as Greece, and relatively remote countries with higher intensities, such as New Zealand and Korea.

Using the same indicator as for FDI, Figure 7 shows the patterns of geographical specialisation over the 1990s in exporting to the European Union, Japan and the United States. The relative distance of each country from the three destinations seems to matter. Japan is the favourite destination of exports from Australia, New Zealand and Korea; and the United States is the favourite destination of exports from Canada and Mexico. Exports from European countries are more uniformly distributed, though still biased towards EU destinations. Clearly, as neighbouring countries are often linked by free-trade agreements (such as the EU Single Market or NAFTA), the transport cost effect underlying these patterns is likely to act in parallel with a free-trade area effect (see below). Indeed, develop-

Figure 7. **Patterns of geographical specialisation in goods exports to the European Union, Japan and the United States**[1]

Average of the 1990s



1. Geographical specialisation in goods trade is defined as the revealed tendency of a country to export a share of exports of its total exports to a partner country, which is larger than the share exported to that country by the OECD in total OECD exports. A country is "geographically specialised" when the indicator is above unity.

Source: OECD.

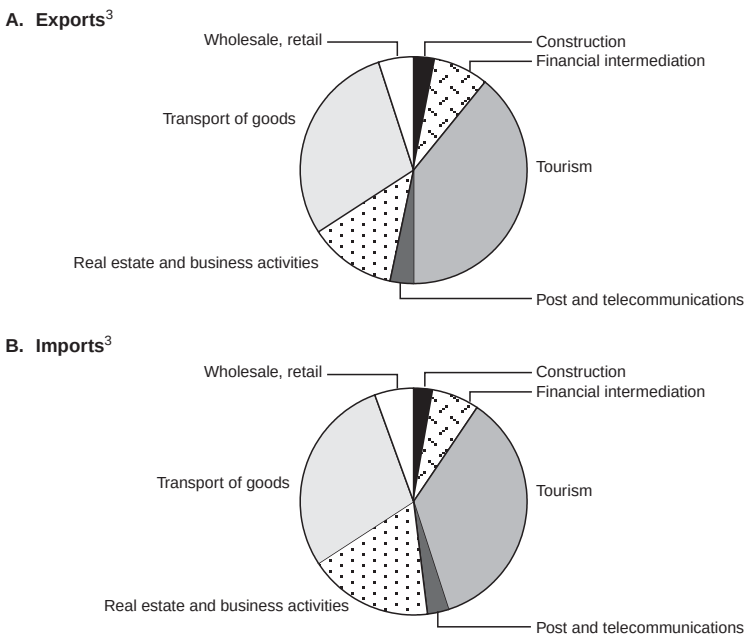
© OECD 2003

ments in both European and North American countries suggest that free-trade agreements such as the EU Single Market and NAFTA may have borne their fruits over the 1990s.

Trade in services

Figure 8 shows the average industry structure of OECD trade in services in 1999 as recorded in balance of payments statistics on multilateral trade, which cover only a subset of modes of cross-border services supply (notably excluding commercial presence and movement of individuals) (see Box 1). According to these figures, most services trade, whether exporting or importing, relates to tourism (around 30 per cent) and transport (around 25 per cent), followed by business

Figure 8. **Composition of services trade in the OECD area,[1] 1999**
OECD average[2]

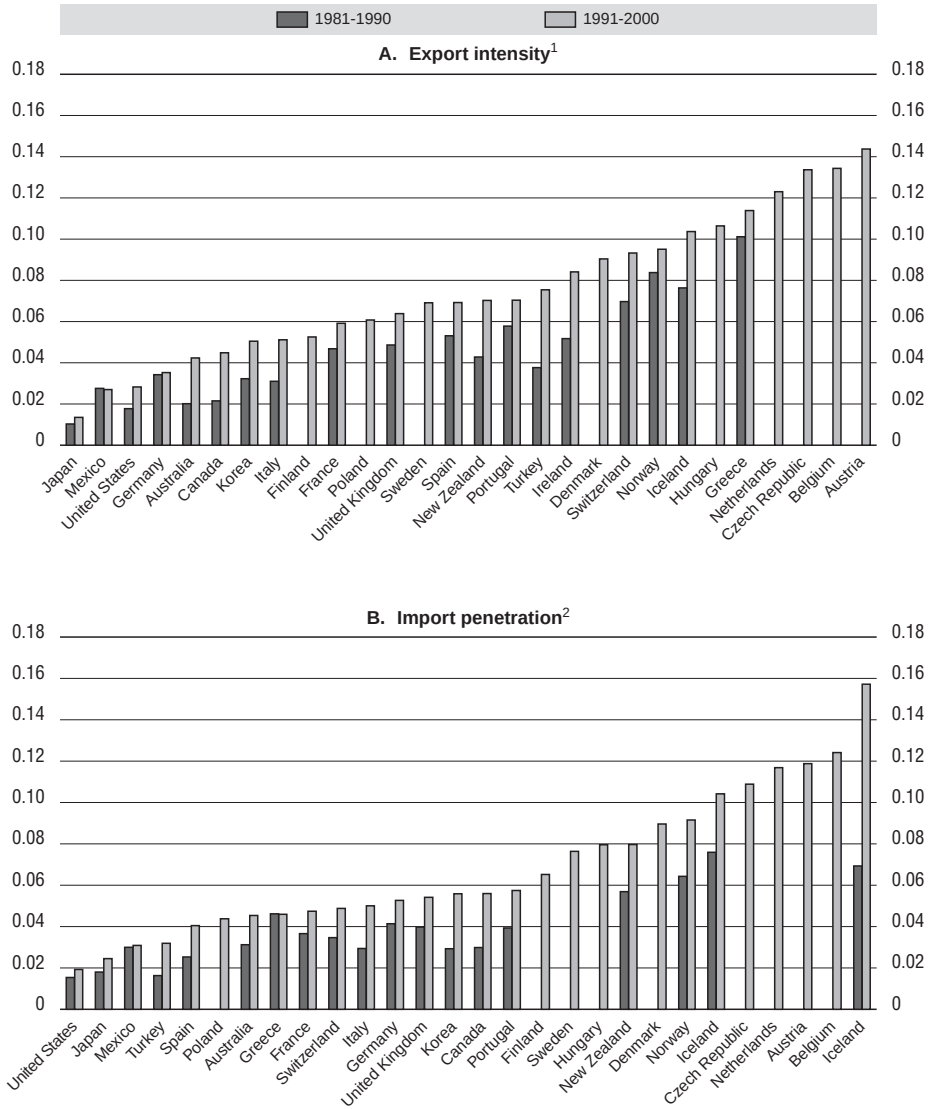


1. Service trade reported by balance of payments statistics includes only cross-border supply and consumption abroad. Service supplied through commercial presence or movement of individuals are excluded.
2. Simple average.
3. Ratio of exports or imports in each industry to total exports or imports.

Source: OECD.

© OECD 2003

Figure 9. **Intensity of global trade in services, 1980s and 1990s**



1. Export intensity is defined as the ratio of exports to GDP.
2. Import penetration is defined as the ratio of imports to domestic absorption.

Source: OECD.

© OECD 2003

services (12 per cent) and financial services (6 per cent). The composition of services trade is similar at the individual country level. In other words, a large share of trade in services is related to international movements of people and manufactured goods. Yet, the most striking feature of services trade is that both export and import intensities are several times lower than the corresponding trade intensities for goods in all OECD countries for which data are available, with the ratio of manufacturing to services trade flows generally ranging from three to six in most countries. Even though such gaps could be narrowed once cross-border supply through commercial presence (*i.e.* FDI) is taken into account, differences in the trade intensities of goods and services are puzzling.

Lower services trade intensities are often related to the cost of transport, which is, for some services, much higher than the cost of shipping manufactured goods.[9] Also, the influence of geographical and structural factors, such as location and size of the economy, on trade in services and goods may differ. Cross-country patterns of export intensities and import penetration ratios suggest that these factors play partly the same role as for trade in goods (Figure 9). Trade is strong in relatively small and well-located countries – such as Austria, Belgium, the Netherlands and Ireland – and weak in relatively large or remote countries – such as the United States, Japan and Australia. However, these patterns are less clear than for goods trade and, indeed, the cross-country correlation between export intensities in goods and services is relatively low (around 0.2), though the correlation of import penetration ratios is higher (around 0.6). This suggests that other forces are impinging on the openness of OECD economies to trade in services.

Twin developments in FDI and trade

The discussion of trends and patterns in FDI and trade offers *prima facie* evidence that the two phenomena are closely linked: both increased sharply over the past decade; both seem to be at least partly affected by factors related to distance, location and size of the economy; and in some cases trade openness seems to go hand in hand with high FDI and foreign affiliate activity, such as in Ireland and Belgium. Table 1 provides further evidence concerning this stylised fact at a finer level of detail. It reports the correlations between different measures of bilateral trade and bilateral FDI over the period 1980-2000 as well as in subperiod averages. All correlations are positive and significant at conventional levels, with particularly high coefficients between trade measures and FDI outstocks and instocks.

Although these correlations may imply a testable hypothesis that to some extent trade and FDI may be driven by the same set of economic factors, they are not necessarily evidence in favour of complementarity between FDI and trade. As discussed in the next section, at the firm or industry level the relation-

© OECD 2003

Table 1. **Bivariate correlations between bilateral trade and FDI**[1]

Bilateral FDI measures	Outward position	Inward position	Outward investment	Inward investment	Outward position (% of GDP)	Outward investment (% of GDP)
Bilateral trade measures						
A. All available years						
Manufacturing exports	**0.64**	**0.57**	**0.39**	**0.34**		
	(5 998)	(5 963)	(7 930)	(7 610)		
Manufacturing imports	**0.59**	**0.63**	**0.34**	**0.37**		
	(5 997)	(5 961)	(7 930)	(7 610)		
***Services* exports**[2]	**0.81**	**0.83**	**0.50**	**0.58**		
	(344)	(347)	(559)	(498)		
Services imports[2]	**0.77**	**0.67**	**0.45**	**0.53**		
	(344)	(347)	(559)	(498)		
Total exports	**0.64**	**0.58**	**0.36**	**0.40**		
(manufacturing plus services)	(344)	(347)	(559)	(498)		
Total imports	**0.61**	**0.63**	**0.35**	**0.41**		
(manufacturing plus services)	(344)	(347)	(559)	(498)		
B. Average 1990-2000						
***Manufacturing exports* (% *of* GDP)**					**0.73**	**0.71**
					(298)	(321)
C. Average 1998-2000						
***Total exports* (% *of* GDP)**					**0.61**	**0.57**
					(67)	(76)

1. Number of observations in parentheses. All correlations are significant at 5 per cent levels.
2. Balance of payments definition.
Source: OECD.

ship between FDI and manufacturing trade crucially depends on whether FDI is aimed at accessing foreign markets or fragmenting production in stages. Aggregate evidence concerning FDI and trade is, therefore, the result of conflicting influences and may only be interpreted as suggesting that, overall, one type of FDI dominates the other or, alternatively, that both FDI and trade are correlated to a third variable (*e.g.* income). By contrast, services trade and FDI can be expected *a priori* to be complementary, because establishing commercial presence abroad generally brings stronger services trade in terms of transport (*e.g.* supplying goods to foreign affiliates in the distribution sector), communications (*e.g.* data transactions with foreign affiliates in the financial, telecommunications or tourism sectors), etc. FDI in the services sectors indeed accounted for up to 65 per cent of total FDI flows (OECD, 2002c). In this connection, it is interesting to note that, among the correlations in Table 1, those between FDI and services exports and imports (which due to lack of data focus on the most recent period) are the highest.

© OECD 2003

POLICY AND OTHER DETERMINANTS OF TRADE AND INTERNATIONAL INVESTMENT

Two broad sets of factors jointly affect trade and FDI: *non-policy factors* – including the effects of gravity (*e.g.* market size and distance) and factor proportions (*i.e.* relative endowments of different inputs) – and *policy factors*. The influence of these factors (*i.e.* the sign of the relationship and its intensity) is not necessarily the same across FDI and trade. In particular, it may depend on whether FDI is of the horizontal or vertical type (Box 2). Moreover, their influence may also differ in some cases across trade in goods and trade in services.

With an eye to the interdependency between trade and FDI, this section principally looks at key policy factors, grouping them into four categories: openness, product-market regulation, labour-market arrangements and infrastructure.[10] Some of these policy channels restrict market access by exporters and foreign investors. For instance, non-tariff barriers and FDI restrictions raise border obstacles to trade and investment. Other border and non-border policies make trade and investment unprofitable, for instance by increasing the relative cost of foreign *versus* home goods (*e.g.* tariffs or regulations that raise production costs) or decreasing the net returns of MNEs when they invest abroad. Finally, policies can also raise the overall cost of the transaction by affecting the costs of inputs that both the exporter and importer must use in order to implement the exchange (*e.g.* transport or communication services). Alternatively, policies can facilitate trade and FDI, for example by creating areas of free trade, improving the business environment in which exporters and MNEs operate or reducing the cost of transactions through the development of the necessary infrastructure.[11] This section shows by means of newly-developed indicators that approaches often differ across countries in each of the four policy categories and, when possible, offers *prima facie* evidence that these differences may be relevant for trade and FDI.

Openness

As noted above, openness of a country to trade and FDI is assessed here in terms of policies that create (or eliminate) border barriers for exporters or investors, measured by indicators of tariff and non-tariff barriers, statutory restrictions to FDI and multilateral agreements that create areas of free trade among signatory countries.

Tariff and non-tariff barriers

Figure 10 reports the evolution of average (import-weighted) most-favoured-nation (MFN) tariff rates and import coverage of non-tariff barriers from 1988 to 1996, the latest year for which time-series data are available.[12] The conclusion

© OECD 2003

Box 2. **Trade and different types of FDI**

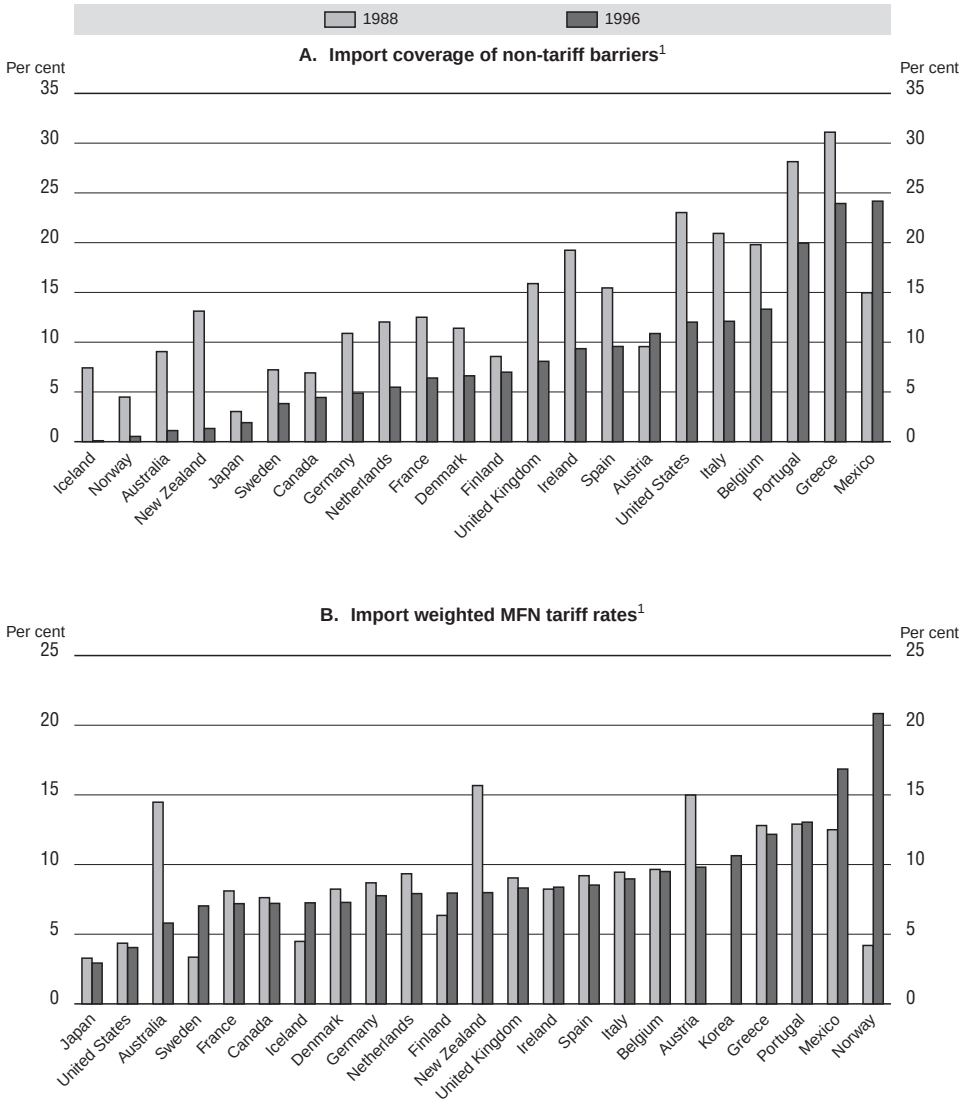
As pointed out by recent research, the interdependence of trade and FDI derives from the fact that the decision to export or invest abroad for producing locally is increasingly taken by the same unit, the multinational enterprise. This is clearest in the so-called "knowledge-capital" theory of the MNE (Markusen, 2002; Markusen and Maskus, 2001), which builds on previous work by Dunning (1981) and Buckley and Casson (1985). This theory notes that three types of firms exist in each country: purely domestic firms, which have headquarters and plants that produce only at home for local or export markets; the horizontal MNEs, which have headquarters at home and production plants both at home and abroad that produce the same goods; and the vertical MNEs, which fragment different stages of production by having headquarters at home and production plants in different foreign countries that produce different intermediate or final goods. Since the objective of the horizontal MNEs is to access foreign markets, trading or investing abroad are two substitute activities. They will choose one or the other depending on their relative returns, which depend among other things on the cost of trade, the cost of FDI and the firm-level economies of scale they can enjoy by duplicating production plants in foreign countries.* By contrast, the objective of vertical MNEs is to take advantage of cross-country comparative advantage patterns by locating plants in different countries in order to specialise in different stages of production. Therefore, trade and FDI are complementary activities: vertical MNEs will typically export components to foreign affiliates and re-export to the home (or other) markets the goods produced abroad. Recent evidence suggests that horizontal MNEs may be prevalent in the OECD area, partly reflecting the increasing similarity in factor costs and endowments among member countries (OECD, 2002d). However, MNEs' strategies have also been shown to vary across OECD countries, with horizontal strategies dominating in the United States (Markusen and Maskus, 1999) and vertical strategies dominating in Sweden (Mathä, 1999) and France (Soubaya Camatchy Ariguelou, 2002). See OECD (2002e) for a discussion of the relationship between trade and FDI.

* Firm-level economies of scale arise when two-plant firms have fixed costs that are less than the double those of a single-plant firm. Firm-level economies of scale and trade costs are crucial elements for explaining the existence of horizontal FDI, as first pointed out by Markusen (1984).

of global and regional trade agreements (Box 3) during this period was reflected in a decline of both non-tariff and, to a lesser extent, tariff barriers within the OECD area. However, cross-country differences in average barriers still persist. Indeed, using a recent data set that includes a wider set of tariffs at the bilateral level, Figure 11 shows that in 2001 the dispersion of average (unweighted) applied tariff

© OECD 2003

Figure 10. **Manufacturing trade liberalisation in the OECD area, 1988-1996**



1. OECD calculations based on UNCTAD data. Aggregation from 2-digit level tariffs to national level using sectoral value-added weights. See annex for details on sources and methodologies.

Source: UNCTAD, OECD.

© OECD 2003

Box 3. **Trade agreements**

Almost all countries participate in one or more regional agreements, either as regional members or by virtue of bilateral agreements between regional groups and individual countries. In addition, there are bilateral agreements between countries (*e.g.* the accord between the United States and Chile). These agreements involve preferential trade provisions. However, the degree of integration they imply varies considerably. The main agreements can be classified, in order of increasing integration, as follows:

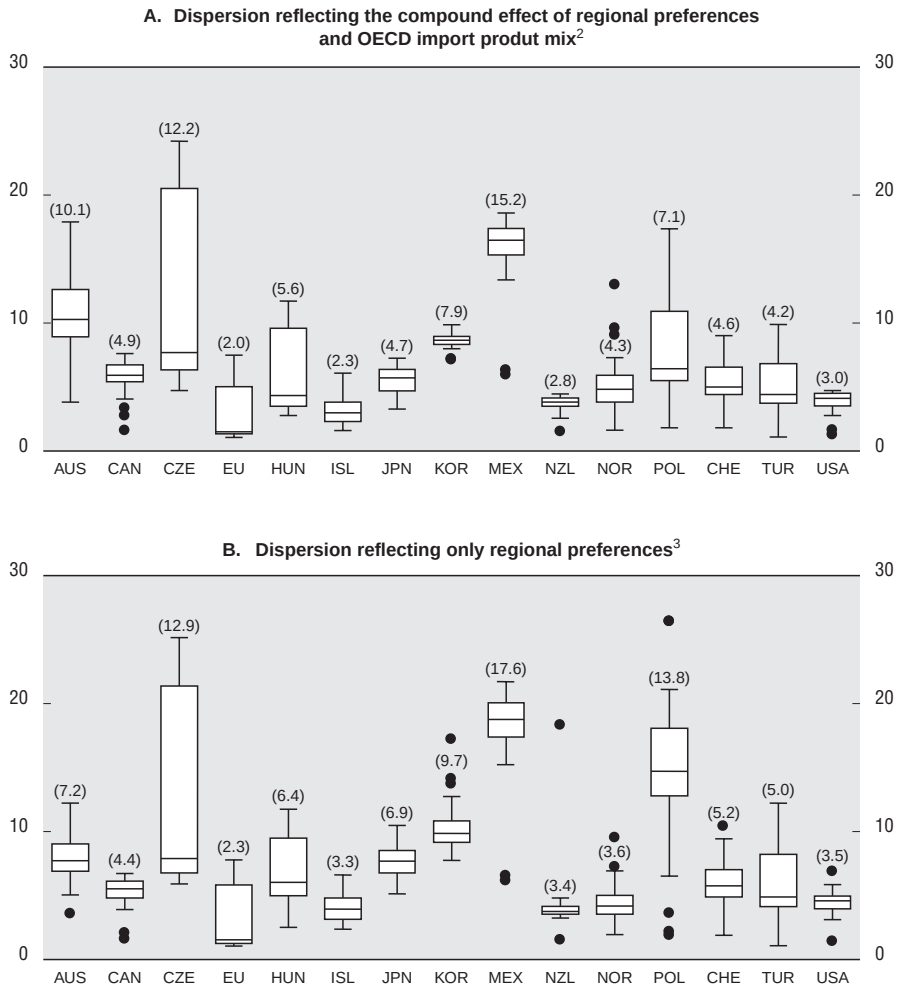
1. A*greements to consult and co-operate*, without any binding harmonisation of policies, such as the Asia Pacific Economic Co-operation Group (APEC), signed in 1989, or the Association of South-East Asian Nations (ASEAN), signed in 1967 (whose members are currently planning to create a free trade area).
2. F*ree-trade areas*, in which trade is liberalised within the group, but no common external tariff is adopted, such as the North American Free Trade Agreement (NAFTA), signed in 1994, the European Free Trade Area (EFTA), signed in 1960, and numerous bilateral agreements. Such arrangements require the establishment of rules of origin for imported products. They may cover different sets of transactions and imply different levels of integration among signatory countries. For instance, NAFTA includes both trade and FDI provisions.
3. C*ustoms unions*, whose members agree to common external tariffs, such as Mercado Común del Sur (MERCOSUR), signed in 1995, and several other agreements in developing countries.
4. C*ommon markets*, with free movement of labour and capital, and where economic integration transcends a customs union towards a fuller harmonisation of economic regulations, such as the 1992 European Single Market.
5. E*conomic unions*, involving full harmonisation across a range of economic policies, a direction taken in 1998 by the European Union with the Maastricht treaty and the single currency.

Economic theory suggests that preferential trade liberalisation can increase welfare when it results in "trade creation" – trade that is consistent with comparative advantage – or reduce welfare in the case of "trade diversion" – when trade is diverted to less efficient partner countries. Dynamic gains resulting from scale economies and increased competition are also important, as is the potential for "deeper integration" amongst participating countries. On the other hand, complex rules of origin can lead to high administrative costs and possibly corruption. Another point of contention is whether regional blocs are "building blocks" or a "stumbling blocks" towards multilateral liberalisation. Regional integration is, in principle, contrary to the fundamental GATT/WTO principle of non-discrimination, but the WTO does allow such agreements in practice as long as substantially all trade is liberalised (art. XXIV). For more details, see OECD (2001c and 2002f), Panagariya (1999) and Hoekman and Schiff (2002)

© OECD 2003

Figure 11. **Median and dispersion of bilateral applied tariffs by importing countries in 2001**[1]

(Average values in parentheses)



1. The box plot shows, for each country, the variation in the tariffs imposed on imports from partner countries. The median value of the tariff is depicted by the horizontal line in the box, the third and second quartiles of the cross-country distribution by the edges of each box, and the extreme values by the two whiskers extending from the box. Dots identify outlier observations.
2. ISIC rev. 3 two-digit industry-level tariffs were aggregated to national level using the weights of the OECD import product mix.
3. National levels represent a simple average of ISIC rev. 3 two-digit industry-level tariffs.

Source: International Trade Center, Geneva and CEPII, Paris.

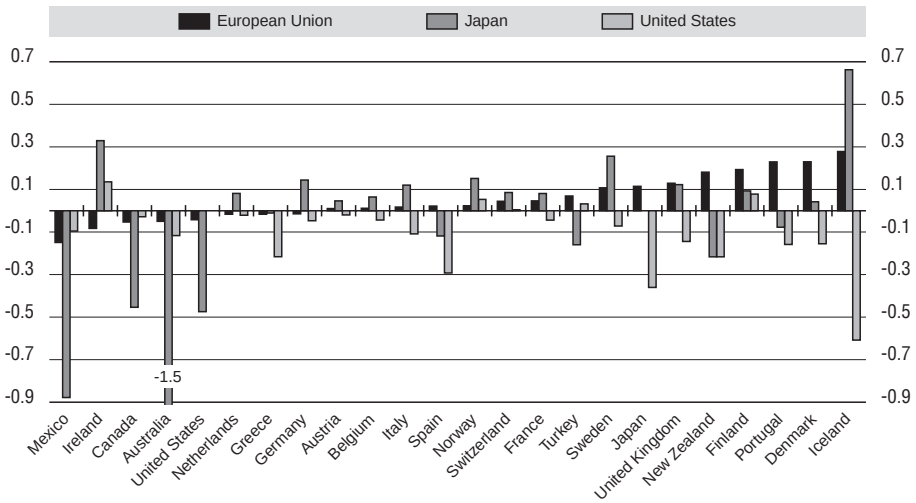
© OECD 2003

rates was indeed wide across OECD country pairs. This reflects tariff discrimination across trading partners, which may well contribute to explaining differences in bilateral trade intensities among OECD countries.[13]

Trade agreements tend to match and accentuate the gravity forces (see below) that affect bilateral trade among signatory countries.[14] The positive influence of free-trade areas on trade could be less pronounced for services, since non-border barriers may be more relevant for this kind of products. Suggestive evidence on the positive effects of regional agreements on bilateral goods trade flows among signatory countries is provided in Figure 12, which shows the change in geographical specialisation of exports to the European Union, the United States and Japan over the past two decades. With a few exceptions, EU countries have increased their specialisation towards the European Union, probably reflecting increasing market integration under the Single Market Programme.

In addition to influencing trade openness, tariff barriers can also affect bilateral FDI relationships. Vertical FDI aimed at re-importing to the home country or

Figure 12. **Changes in the geographical specialisation of goods exports to the European Union, Japan and the United States, 1990s *vs.* 1980s**[1, 2]



1. Geographical specialisation in goods trade is defined as the revealed tendency of a country to export a share of exports of its total exports to a partner country, which is larger than the share exported to that country by the OECD. For computational details, see Annex.
2. Change in the average value of the specialisation indicator in the two sub periods. A positive change implies an increase in geographical specialisation. Data are ranked on the European Union figures.

Source: OECD.

© OECD 2003

exporting to third-party countries the final or intermediate goods produced by foreign affiliates can be depressed by high bilateral tariffs between the host and investor country or between the host and third-party countries. On the other hand, high bilateral tariffs can generate so-called "tariff-jumping" behaviour by MNEs. Horizontal FDI that is prompted by tariff-jumping could be positively related to the level of tariffs in the host country. The same kind of relationship could *a fortiori* be expected between horizontal FDI and non-tariff barriers, since the latter often raise absolute barriers to market access (*e.g.* quantitative restrictions). Therefore, non-tariff barriers are likely to have a positive effect on FDI.

The effect of free-trade agreements on bilateral FDI transactions is more complex.[15] By substantially lowering trade costs among signatory countries, free-trade agreements make trade more advantageous than local production, tending to reduce horizontal FDI flows at any given level of fixed costs. However, by enlarging the overall size of the market in the free-trade area, these agreements also increase the scope for reaping firm-level economies of scale through horizontal FDI.[16] Moreover, the reduction in trade costs tends to increase vertical FDI flows that are aimed at re-exporting products into the home country or into other signatory countries. Furthermore, free-trade agreements tend to have a positive effect on horizontal FDI flows from non-signatory countries, because they enlarge the size of the market that they can access by producing locally at any given level of trade costs.[17] In conclusion, the effect of free-trade agreements on FDI flows among signatory countries is ambiguous, while it is presumably positive on FDI flowing from non-signatory countries. These effects are empirically tested in the next section.

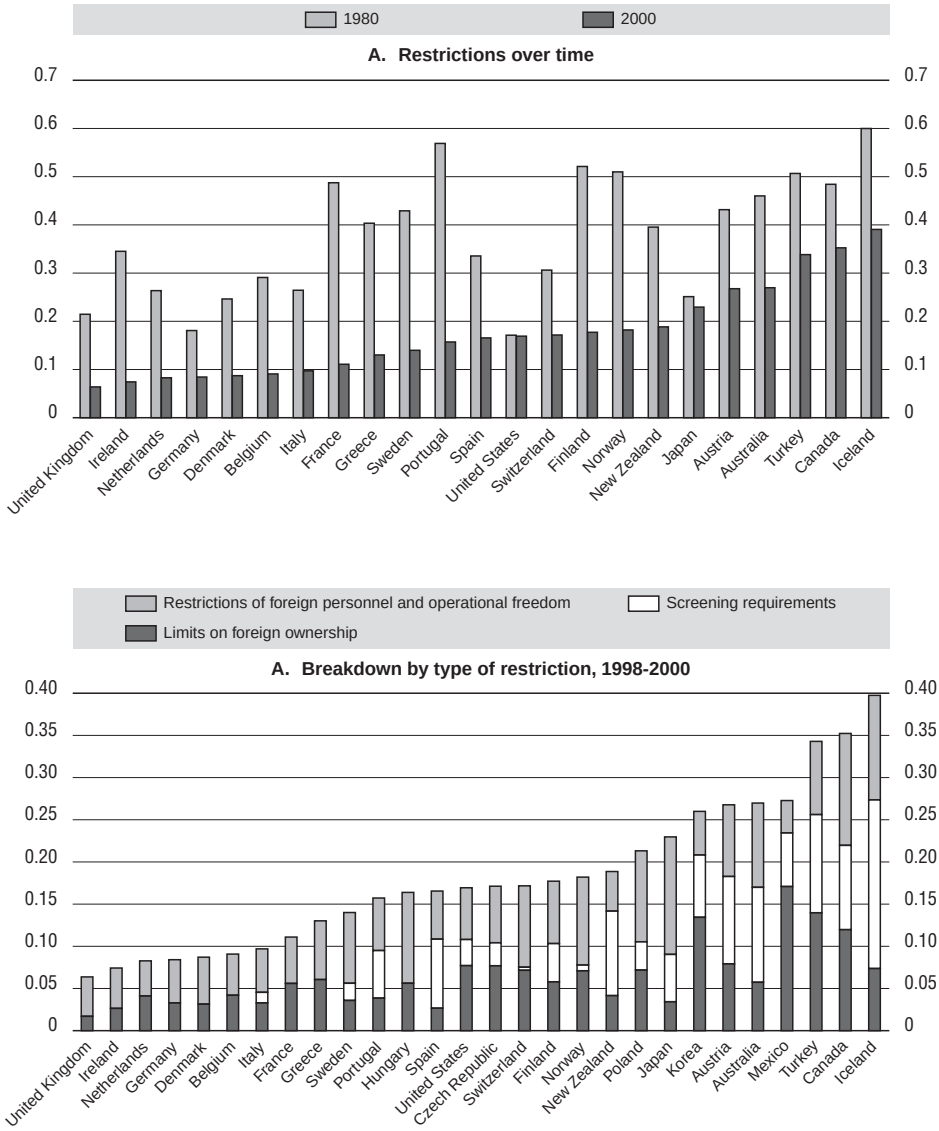
FDI *restrictions*

Although formal international agreements on FDI have been far less extensive than on international trade, global negotiations and regional free-trade agreements often cover some aspects of international investment as well (*e.g.* capital-market liberalisation within the European Union and provisions on commercial presence in the GATS), generally leading to lower barriers to FDI. Moreover, a number of bilateral investment treaties have been signed among OECD countries, aiming at curbing barriers to FDI. A new set of indicators of FDI restrictions was assembled by the OECD to summarise and quantify such barriers and their evolution over time. The indicators, which are described in detail in Golub (2003), cover mainly statutory barriers, ignoring most of the other direct or indirect obstacles impinging on FDI, such as those related to corporate governance mechanisms and/or hidden institutional or behavioural obstacles that discriminate against foreign firms.[18]

According to these indicators (Figure 13), liberalisation of FDI flows has been substantial over the past two decades in all OECD countries except the United

© OECD 2003

Figure 13. **FDI restrictions in OECD countries,[1] 1980-2000**



1. The indicator ranges from 0 (least restrictive) to 1 (most restrictive). The most recent year for which data are available varies across countries between 1998 and 2000.

Source: Golub (2003).

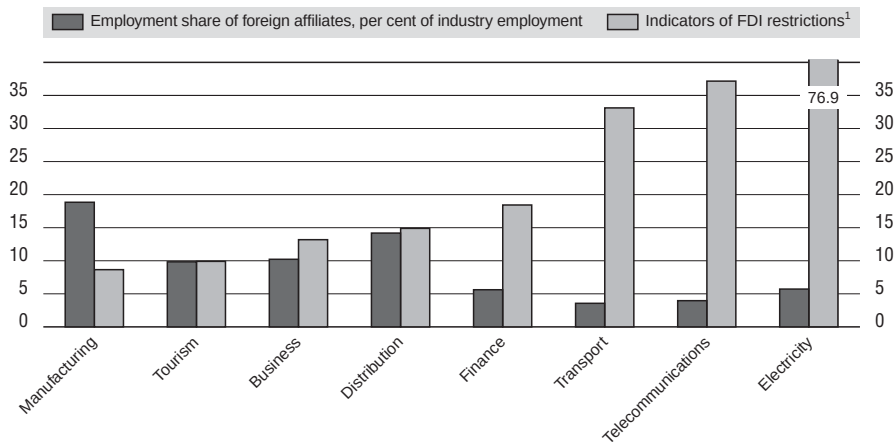
© OECD 2003

States and to a lesser extent Japan, both of which had relatively low statutory restrictions to begin with.[19] Despite the easing of restrictions and their generally much lower level at the end of the 1990s, cross-country differences remain significant, with most EU countries showing greater openness than the United States and Japan, and a few OECD countries maintaining a relatively restrictive approach (Iceland, Canada and Turkey). In most countries, restrictions on control of domestic firms by foreign residents (through either ceilings on foreign-owned equity or limitations on management and business choices) dominate those related to screening procedures (*e.g.* economic benefits or national interest tests).[20] On average, the bulk of restrictions are found in non-manufacturing industries.[21] FDI inflows into manufacturing are almost completely unrestricted, aside from economy-wide restrictions such as notification or screening requirements. Within non-manufacturing, electricity, transport and telecommunications are the most restricted industries, followed by finance, while the other service industries are on average relatively unrestricted.

Variable FDI restrictions across countries, industries and time are a natural candidate for explaining the dispersion observed in bilateral FDI transactions. These restrictions clearly raise barriers to foreign investment of MNEs and are likely to influence their choice among different investment locations. Some evidence of this is provided by Figure 14, which suggests that in very broad terms

Figure 14. **Foreign affiliates and FDI restrictions in the selected industries**

OECD average



1. For this figure, the indicator ranges from 0 (least restrictive) to 100 (most restrictive).
Source: Golub (2003) and OECD.

© OECD 2003

there is a weak but visible inverse relationship between the sectoral shares of employment in foreign affiliates and the level of FDI restrictions across a number of selected sectors.[22]

FDI restrictions may also be expected to influence bilateral trade much in the same way as tariff barriers are expected to influence bilateral FDI. By increasing the fixed costs of local production, they may make it *ceteris paribus* more profitable for horizontal MNEs to access local markets through exports. However, they also tend to decrease vertical FDI and the related export flows. Therefore, the aggregate effect on goods exports is ambiguous *a priori*. FDI restrictions represent an obstacle to services trade because they hinder service provision through commercial presence (through the establishment of foreign affiliates) and could also affect other modes of services trade because exports and commercial presence are complementary in certain industries, such as tourism.

Currency unions

Exchange-rate variability may increase the transaction costs involved in trading goods and services and the risk premia on the returns to FDI. By eliminating those costs and reducing investment risk, currency unions can be expected to increase trade flows and expand FDI. Theoretical and empirical research has shown, however, that the impact of exchange-rate variability on trade is uncertain (for reviews, see McKenzie, 1999, and Taglioni, 2002), though recent evidence tends to find a positive effect of currency unions (Rose, 2000). At the same time, as suggested by Cushman (1985), the effects of reduced exchange-rate volatility on FDI depend on whether the firm sells its output in the host country or abroad, uses the host country or foreign inputs and finances its capital at home or abroad.[23] Therefore, the effect of exchange-rate variability on FDI is ultimately an empirical issue.

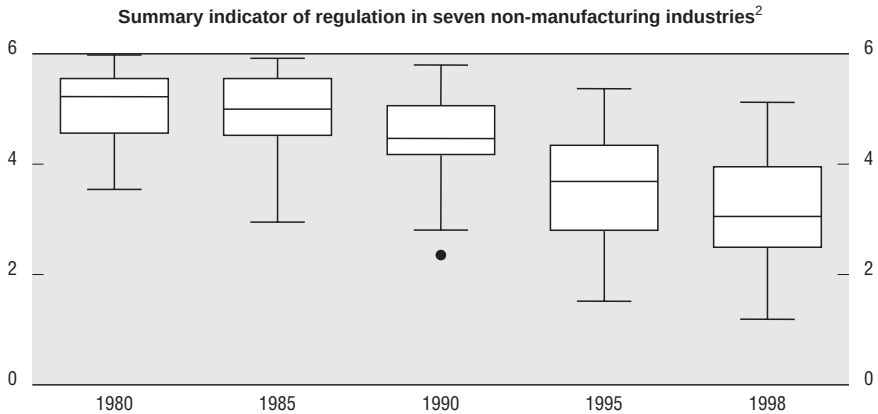
Product-market regulation

Using a summary indicator of regulatory reform that ranks regulations in seven non-manufacturing industries from least to most restrictive of competition, Figure 15 suggests that OECD product markets have become increasingly open to competition over the past two decades. At the same time, the cross-country dispersion in regulatory approaches has increased, due to differences in initial conditions and/or in the scope and pace of reforms implemented by OECD countries. As a result, in 1998 (the last year for which cross-country regulatory data are available) regulations still differed substantially both at the economy-wide level and, especially, at the industry-level in several non-manufacturing industries.[24]

Product-market regulations can affect foreign trade and FDI in multiple and at times conflicting ways. Here, the focus is on regulations in the exporter (investor)

© OECD 2003

Figure 15. **Regulatory reform in OECD countries,[1] 1980-1998**
Summary indicator of regulation in seven non-manufacturing industries[2]



1. The box plot shows, in each year, the median OECD value of the regulatory indicator (the horizontal line in the box), the third and second quartiles of the cross-country distribution (the edges of each box) and the extreme values (the two whiskers extending from the box). Dots identify outlier observations.
2. The indicator ranges from 0 (least restrictive) to 6 (most restrictive). It covers 25 OECD countries.

Source: Nicoletti and Scarpetta (2003).

country or the importer (host) country that curb market forces where competition is viable and/or impose unnecessary costs on the firms involved in the bilateral trade (or investment) transaction.[25] Domestic regulation generally does not discriminate between local and foreign firms, but it may have distorting effects on bilateral trade and FDI flows by affecting the relative prices of different products (*e.g.* tradable *versus* non-tradable or home *versus* foreign) or the relative rates of return expected from investing in different locations.

A way in which relative prices can be affected is when the introduction of anti-competitive regulation in one country increases its production costs, for instance by discouraging efficiency enhancements and productivity growth. In the short run, this tends to make the products exported by this country less competitive in foreign markets. Conversely, cost-increasing regulation in the importer country may tend *ceteris paribus* to make the products supplied by the exporter country more competitive. With wage, price or exchange-rate rigidities, these effects may tend to carry over to the medium to long run. Moreover, cost-increasing regulations (which usually differ across industries) may also induce a reallocation of resources in both the exporter and importer countries, affecting their respective abilities to trade. Another way in which regulations can affect trade patterns is by

© OECD 2003

raising barriers to entry that reduce the number of suppliers, and hence the number of different goods offered, in an export market. This may have negative repercussions on intra-industry trade. Thus, strict product-market regulation in the foreign country potentially has conflicting influences on exports from the home country: on the one hand, it may stimulate exports through a competitiveness effect (at least in the short run); on the other hand, it may depress exports by limiting access to the foreign market.

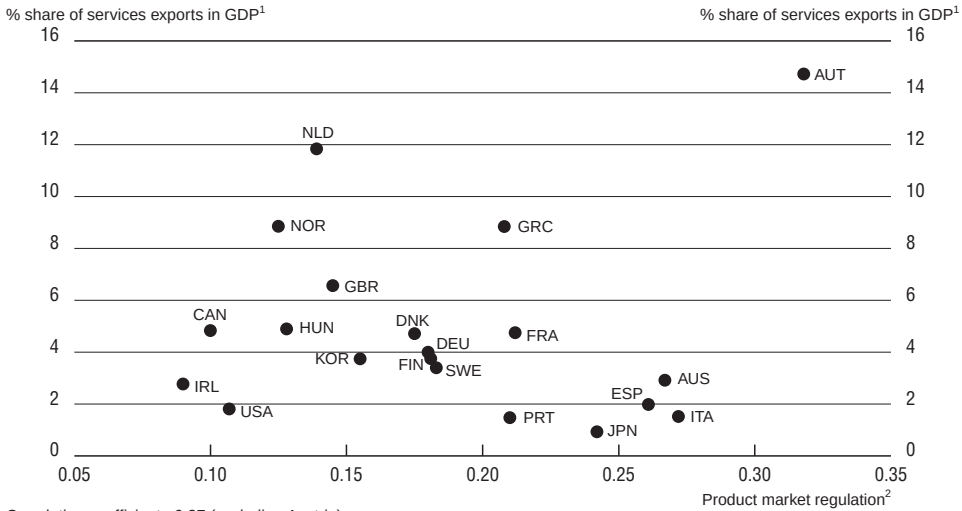
A joint negative influence on bilateral trade can be exerted, in both the source and destination countries, by cost-increasing or barrier-raising regulations that affect industries in which inputs from both countries are needed to produce the traded product. This is the case, for instance, of many traded services – such as transportation, communications and business services – in which capital and labour from both the exporter and importer country are used to supply the service. In these situations, it is the combination of regulations in the countries involved in the transaction that is likely to affect trade flows.[26] Suggestive evidence of a negative correlation between anti-competitive services regulation and the intensity of services trade is provided in Figure 16, which plots the services export and import intensities of OECD countries against a summary indicator of regulation in non-manufacturing (which is increasing in restrictions to competition).[27]

Product-market regulations can also influence FDI by raising production costs or entry barriers, but their effect is more ambiguous:

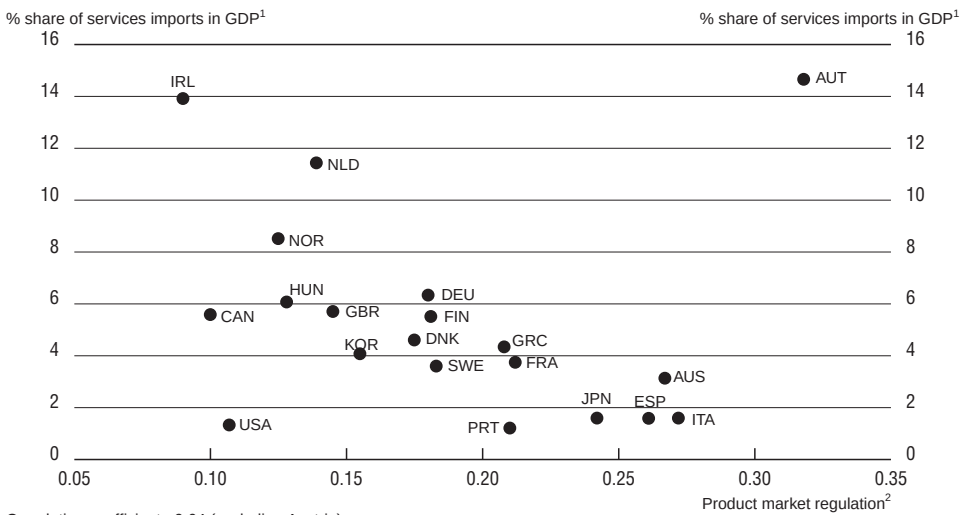
- Cost-increasing regulations in the host country can deter FDI by lowering its expected rate of return if the foreign subsidiary is used as a platform for re-exporting final or intermediate goods back home or to other less regulated countries (the case of the vertical MNE). However, if FDI aims at accessing the local market (the case of the horizontal MNE), cost-increasing regulations in the host country may encourage FDI because the foreign affiliate can take advantage of the production structure of the parent firm, which may be more efficient than in local firms if regulations in the home country are more pro-competitive. Cost-increasing regulations in the home country may also stimulate outward FDI by favouring the delocalisation of production plants in countries with less costly regulations. On the other hand, the costs implied by these regulations may cripple the ability of home-country firms to internationalise production to the desired level.[28]
- Similar conflicting influences can be exerted by regulations that raise entry barriers in host countries. Such entry barriers clearly deter "greenfield" FDI aimed at establishing new firms or creating new production plants. However, by endowing local firms with market power, they can actually encourage inward FDI aimed at acquiring (or merging foreign parents with) existing local firms.

© OECD 2003

Figure 16. **Non-manufacturing regulation and trade in services, 1998**



Correlation coefficient: -0.37 (excluding Austria)
t-statistic: -1.66



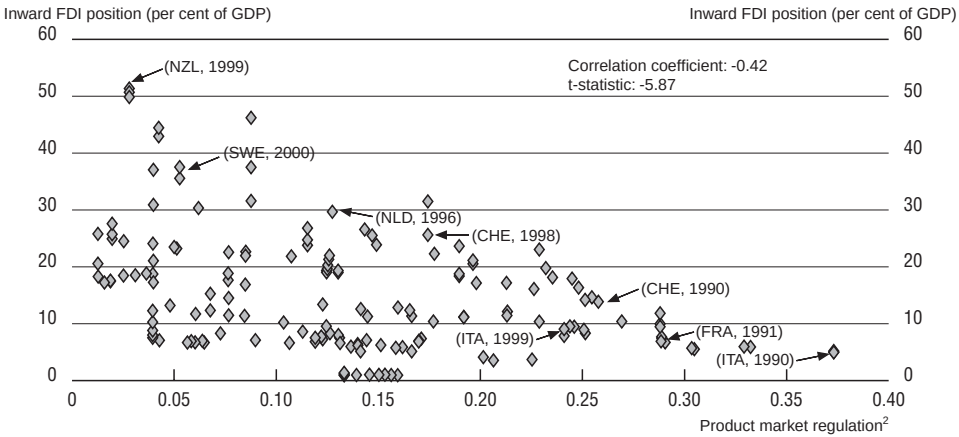
Correlation coefficient: -0.64 (excluding Austria)
t-statistic: -3.45

1. The position of Austria reflects the exceptionally high share of service trade accounted for by tourism.
2. Weighted average of regulatory indicators in 12 non-manufacturing industries. 0-1 scale from least to most restrictive of competition.

Source: Nicoletti and Scarpetta (2003) and OECD.

© OECD 2003

Figure 17. **Product market regulation and FDI, 1990-1998**[1]



1. Each point shows the combination of regulation and FDI in a given country and period. Some of these country/period contributions are shown for illustrative purposes.
2. Product of the indicator of economy-wide regulation in 1998 and the indicator of barriers to entry in seven non-manufacturing industries over the 1980-1998 period. 0-1 scale from least to most restrictive of competition.

Source: Nicoletti and Scarpetta (2003) and OECD.

Despite the potentially conflicting linkages between regulation and FDI, *prima facie* evidence suggests that, on the whole, barriers to entry and cost-increasing regulations in the host country, as summarised by the product of the 1998 indicator of economy-wide regulation with the summary 1980-1998 indicator of barriers to entry in seven non-manufacturing industries, are inversely related with the intensity of inward FDI in OECD countries over the 1980-2000 period (Figure 17).

Labour-market arrangements

A wide set of policies and institutions affect the functioning of the labour market impinging on trade or FDI transactions. In this study, the focus is restricted to employment protection legislation (EPL), collective bargaining mechanisms and labour income taxation, for which comparable cross-country data are available.[29] The OECD (1997c, 1999) has extensively documented cross-country differences in labour-market policies and institutions. Both employment protection and labour income taxation are driven by important policy objectives, but could also have side effects on the level and geographical allocation of trade and FDI.

The main channel through which EPL and labour tax wedges can affect trade and FDI is the influence they may have on the adaptability of labour markets and

© OECD 2003

on the cost of labour.[30] In the absence of offsetting mechanisms, EPL and labour taxes can affect trade and FDI patterns for largely the same reasons as cost-increasing product-market regulations do, *i.e.* by adversely affecting the relative prices of different products, or by adversely affecting relative returns from investing in the country that has stringent EPL or high wedges.[31]

However, the effects of EPL and labour income taxation on trade and FDI may also depend on the regime of industrial relations in place in each OECD country. Previous research has shown that some collective bargaining arrangements can provide an effective offsetting mechanism for the costs implied by labour income taxation and EPL. Specifically, regimes in which bargaining is done at the national (*i.e.* centralised) level and with a tight co-ordination among employers and unions operating in different industries may make it possible to shift the implicit costs of wedges and EPL onto wages, much in the same way as may happen in decentralised and uncoordinated labour markets, provided wage resistance is not encouraged through other arrangements (such as high income replacement rates in unemployment benefit systems).[32] Thus, to the extent that this offsetting mechanism is operating, effects of EPL or tax wedges on trade and FDI should be found mainly in situations in which bargaining is neither co-ordinated nor decentralised, as it is found for instance in countries where negotiations are implemented at the industry level.

The potential offsetting mechanism provided by certain bargaining institutions is likely to be effective for neutralising the adverse effects of high EPL and tax-related costs in the home country on the relative prices of tradable vs. non-tradable goods. Its offsetting effect on the tendency of international investors to divert investment towards locations in which risk-adjusted expected returns are relatively low is more doubtful. This is because strict EPL is likely to affect not only the returns expected from foreign investment (*e.g.* through effects on labour costs that can be offset by bargaining institutions) but also their variability (*e.g.* by influencing the capacity of foreign affiliates to respond to supply or demand shocks), thereby increasing the risk that investors face in the host country. Since MNEs can choose *ex ante* where to locate their investment, they may still tend to move where the risk/return ratio is lowest, independent of the features of bargaining institutions in potential host countries.[33] Similarly, the potential for shifting the costs implied by labour taxation onto wages may be limited in MNEs whose highly-skilled employees and managers are likely to be more mobile across borders than their homologues in local firms.

Infrastructure

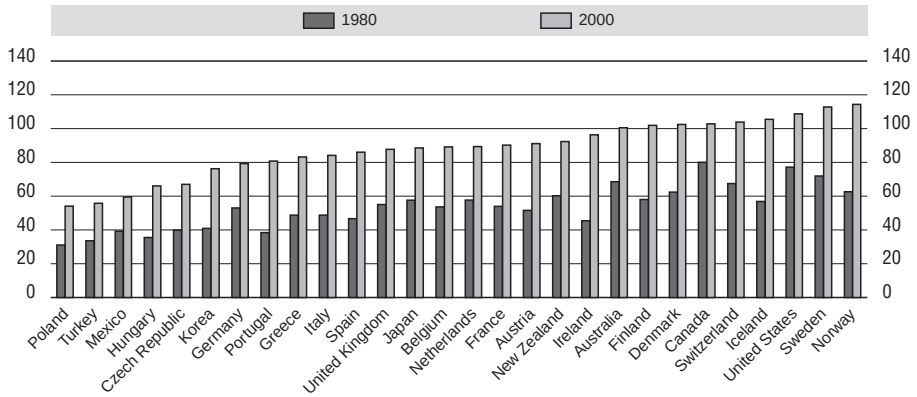
Trade and FDI may also be affected by factors that are, or have been, closely-related to government policies regarding transportation, communica-

© OECD 2003

tions and energy supply. Indeed, due to their public good and natural monopoly characteristics, some fixed network infrastructures are financed through public investment.[34] Figure 18 uses a new set of indicators to show the evolution of infrastructure endowments of OECD countries over the past two decades. The indicators are increasing in the quality and quantity of infrastructure and summarise information about transport, communication and energy supply infrastructure (Box 4). There have been substantial increases in infrastructure capital over the period in all OECD countries. By the year 2000, the Nordic countries, the United States, Canada, Australia and other small European countries, such as Switzerland and, to a lesser extent, Ireland had the highest levels of infrastructure. New OECD members and transition NScountries, such as Mexico, Turkey, Poland and to a lesser extent Hungary, the Czech Republic and Korea, were estimated to have relatively low levels of infrastructure.

The provision of infrastructure may affect comparative and absolute advantage and, therefore, cross-country patterns of trade and FDI (Findlay, 1996). Infrastructure is likely to be particularly important for trade in services, because the main items traded (travel, freight, communications, banking and business services) depend heavily on the existence of high capacity and efficient networks in

Figure 18. **Infrastructure endowments**[1]
United States 1998 = 100



1. The indicator is the crossing of the quality and quantity of infrastructure in transport, telecommunications and electricity. It increases with infrastructure endowments and is expressed relative to the 1998 level of the indicator in the United States.

Source: OECD.

© OECD 2003

Box 4. **Infrastructure indicators**

The infrastructure indicator summarises, on a 0-1 scale, the quality and quantity of telecommunications, transport and electricity infrastructure. Items covered include mainlines per capita, mobile phones per capita, the share of digital lines in total lines, answer seizure ratios (*e.g.* the percentage of successful international phone calls) and fault rates (*e.g.* the percentage of faults repaired within 24 hours) in telecommunications; length of motorways per capita, length of paved roads per capita and aircraft departures per capita in transport; transmission losses, generating capacity per capita and reserve margins in electricity supply. The relevant data were drawn from the OECD, the European Conference of Ministry of Transportation, International Energy Agency and World Bank sources. Each sectoral indicator is a weighted average of the corresponding items. The overall infrastructure indicator is a weighted average of the three sectoral indicators. Weights assigned to items and sectors reflect judgements about the economic relevance of each component. A time-series of the indicator was calculated for the 1980-2000 period.

countries that are at both ends of the transaction. Thus, the combination of infrastructure conditions in the exporter and importer countries is likely to be relevant for services trade, much in the same way as for product-market regulation (see above). The availability and the quality of infrastructure may also positively affect inward FDI because good infrastructure lowers transactions costs, facilitating international specialisation and the location choices of footloose industries (Jones, 2000).[35] However, a possible complication is that FDI in infrastructure has increased in recent years. Thus, it is possible that countries with weaker infrastructure might attract FDI, implying a reverse relationship between FDI and infrastructure endowments.

Geographical and economic factors

As already mentioned, a number of factors unrelated to government policies can impinge on trade and FDI. Gravity factors are mainly related to market size and distance: the volume of transactions between two countries tends to increase as their incomes get larger, but decreases with the distance between them due to transport costs.[36] Total and relative market sizes are also important determinants of horizontal FDI, because the returns from such investment depend on economies of scale at the firm level (see Box 2). On the other hand, factor proportions are important because they determine each country's comparative advantage in trading goods and services, and also affect the extent to which vertical FDI is

© OECD 2003

implemented.[37] In general, geographical and economic factors are expected to affect trade and FDI in the following ways:

- Exports and outward FDI both tend to be positively affected by the combined market size of the countries involved in the transactions, due to both gravity effects and economies of scale.
- Exports and *horizontal* outward FDI also tend to be positively affected by the size similarity of the two countries. Size similarity stimulates intra-industry trade and favours firm-level economies of scale of horizontal MNEs, which have multiple production plants at home and abroad producing the same good (or service) (see Markusen, 2002).
- Exports tend to be negatively affected by distance and transport costs. However, their effects on FDI are unclear because they also imply transaction costs for investors, and these costs could offset any advantage that FDI may have over trade when dealing with distant and ill-connected countries.[38]
- Exports tend to be stimulated by differences in factor endowments of trading partners, because these make it possible to exploit comparative advantages. For broadly the same reason, dissimilarities in factor endowments also encourage vertical FDI. Conversely, horizontal FDI is discouraged by factor dissimilarities because they may make production of the same good in different countries difficult.

EMPIRICAL EVIDENCE

This section presents evidence on the impact of policy and other factors on bilateral outward FDI positions (henceforth FDI outstocks), multilateral inward FDI positions (henceforth total FDI instocks), bilateral exports of goods and bilateral exports of services of OECD countries. Thus, the focus is on the determinants of exports or outward FDI from a country to its partners and the determinants of the global attractiveness of a country for international investors. For ease of exposition, only the results from "preferred" regression specifications are reported below (for detailed results, see Nicoletti *et al.*, 2003). It should be noted at the outset that, due to limitations in data coverage, the data sets on which the results are based vary across the dependent variables and the policies considered. FDI outstock and instocks as well as goods exports cover 28 OECD countries and partners over the 1980-2000 period at the bilateral and multilateral levels. However, a long enough time-series of total FDI instocks is only available for a smaller set of OECD countries. Bilateral exports of services cover 20 reporting countries and

© OECD 2003

27 partners over the 1999-2000 period. All trade and FDI variables are expressed in dollars at 1996 purchasing power parity values.[39]

Approach

The estimated equations are reduced forms relating trade in goods, trade in services and FDI outstocks to broadly the same set of factors. This is in line with recent research that stresses the joint determination of trade and FDI transactions.[40] Bilateral exports and outward FDI from the home country to the partner country (henceforth partner for brevity) were related to *i*) geographic and non-policy-related structural factors, and *ii*) the relative costs of trading and investing implied by policies in the home country or partner. FDI regressions focus on bilateral outstocks and multilateral instocks; results for bilateral outflows are broadly the same.[41]

Thus, the building blocks of the estimated equations are *geographical and non-policy-related structural factors* including:

- *Variables expressing gravity forces*: total GDP (the sum of home country and partner GDPs in bilateral equations) proxying for total market size; an index of similarity of GDPs proxying for size similarity; distance (from capitals); and transport costs (computed as the difference between CIF imports in the partner and FOB exports by the home country).[42]
- *Variables expressing factor proportions*: dissimilarity in capital-labour ratios; and dissimilarity in human capital endowments (taking into account the share of population by different education levels and average years of schooling in each level).
- *Other economic variables likely to affect trade or* FDI: R&D intensity in the home country or partner, defined as the ratio of business R&D expenditure to GDP; bilateral exchange rates, defined as nominal exchange rates in bilateral equations and effective (import-weighted) nominal exchange rates in total instock equations; and exchange rate variability, defined as the standard error of the monthly exchange rates.[43]

As in the previous section, *policy factors* are grouped in four categories:

- *Openness*: multilateral and bilateral tariffs; multilateral indicators of non-tariff barriers; dummies for free-trade agreements (henceforth FTA); and the indicator of FDI restrictions described in Golub (2003).
- *Product-market regulation*: this covers two broad areas – protection of intellectual property rights (henceforth IPR) and regulations curbing competition. The former is proxied by the Ginarte and Park (1997) cross-section indicator of protection of IPR in 1997. Anti-competitive regulation is proxied in two different ways. FDI and trade in goods are related to a time-series indicator that combines barriers to entry in seven non-manufacturing industries over

© OECD 2003

the 1980-1998 period with economy-wide regulation in 1998. Trade in services is related to an indicator summarising barriers to entry in twelve non-manufacturing industries in 1998.

- *Labour-market arrangements*: the tax wedge on labour income; an indicator of employment protection legislation (EPL); and an indicator of the degree of centralisation and co-ordination of the bargaining regime. The latter two indicators are interacted to account for the possible influence of bargaining institutions on the costs implied by EPL (see above).
- *Infrastructure*: the indicator of infrastructure supply in transport, telecommunications and electricity.

All indicators are normalised and range from 0 to 100. The scale of all policy indicators is from least to most restrictive, except for the indicator of IPR which is increasing in the *lack of* protection. The infrastructure indicator is increasing in the quality and quantity of infrastructure. Details on all variables and indicators used in the regressions, including sources, definitions, methodologies, sensitivity analyses and a description of cross-country patterns are contained in Nicoletti *et al.* (2003).

The empirical estimates are based on panel regressions that take into account four different kinds of effects potentially unexplained by the above set of variables and indicators: *i*) time invariant effects that are specific to each home country and partner (*e.g.* institutions, data collection and reporting methods); *ii*) time invariant effects that are specific to each country pair involved in bilateral transactions (*e.g.* common language, cultural affinity); *iii*) time-varying factors common to all home countries and partners (*e.g.* global demand, supply or technology shocks); and *iv*) time-varying factors specific to each home country and partner (*e.g.* business cycle, country-specific technology shocks).[44] The econometric approach takes into account these factors either explicitly (by estimating the relevant parameters) or implicitly (by transforming the data prior to estimation) as in Erkel-Rousse and Mirza (2002).[45] In the analysis of bilateral trade or FDI, the observations are home country-partner pairs in each period; in the analysis of total FDI instocks observations are countries in each period. The analysis of total FDI instocks accounts for the possibility that the adjustment of actual to desired stocks of FDI is costly and takes time. Therefore, equations for total FDI instocks are of the dynamic partial adjustment kind, with the total FDI instock in each period also depending on the realised instock in the previous period (see Cheng and Kwan, 2000, for a similar specification). Moreover, the estimations also account for the possibility that some of the variables explaining FDI might be endogenous to outcomes (*e.g.* while the FDI instock may depend on infrastructure conditions in the country, infrastructure conditions themselves may depend on FDI in infrastructure) by using an appropriate instrumental variables estimation approach. Finally, the total instock equations also account for the possibility that investments in FTAs are the outcome of a two-stage

© OECD 2003

process in which, first, the decision is made to invest in the FTA, and, second, locations within the FTA are chosen based on the relative attractiveness of member countries.[46] Estimation methods are briefly summarised in Box 5.

All the results reported below are based on full-model specifications including both non-policy related variables and policy variables. However, the results are generally robust to the omission of subsets of policy variables. It is important to keep in mind that the results for the total FDI instock are based on a dynamic specification, which is significantly different from the static bilateral one, and covers a more limited set of countries.[47]

Non-policy-related structural factors impinging on trade and FDI

Table 2 reports the estimates of the basic equations that include only non-policy-related structural factors. Four main features stand out:

- First, as expected, the coefficients of the gravity variables are correctly signed and significant in all equations. Thus, market size, market similarity, distance and transport costs affect in the same way FDI and exports of goods and services.[48]
- Second, the estimated effect of market size on trade in services and FDI is stronger than in goods trade, while the effect of transport costs (proxied by distance in the services trade equations) is smaller. While a smaller effect of transport costs on FDI is expected, because these should affect (indirectly) only vertical MNEs, the smaller effect on services is surprising, because such costs are often quoted as the reason for the lower intensity of trade in this sector. Thus, neither gravity nor transport cost factors seem able to explain the different trade intensities observed for goods and services.
- Third, the effects of differences in endowments of labour and physical or human capital vary across FDI, trade in goods and trade in services. Differences in endowments positively affect trade in goods, as would be expected from comparative advantage considerations. However, factor dissimilarities negatively affect outward FDI, though a high level of human capital tends to attract inward FDI. Taken together, the findings of a positive effect of market size similarity and a negative effect of factor dissimilarity support the conjecture that FDI by horizontal MNEs is prevalent among OECD countries Finally, factor dissimilarities have no statistically significant impact on services trade. This finding may be interpreted as suggesting that the various kinds of services respond unevenly to those differences (*e.g.* while comparative advantage factors could sometimes be playing a positive role in tourism, similarity in endowments could be needed in financial or communication transactions).

© OECD 2003

Box 5. **Empirical methods**

Regression results are obtained from single-equation estimation of reduced forms for bilateral FDI outstocks, goods exports and service exports as well as for total FDI instocks. To appropriately account for both the cross-section and time-series dimensions of the data, panel data estimation methods are used.

In bilateral equations, panel data methods require controlling for unobserved factors that are specific to each country, each partner, each country-partner pair and each period, as well as for shocks that are common to all countries over time. However, estimating dummies for all these factors is not viable, due to an excessive loss of degrees of freedom. Therefore, the "transformed least squares" (TLS) approach (Erkel-Rousse and Mirza, 2002) was employed, which simplifies the equation to be estimated while at the same time preserving the desirable properties of the relevant coefficient estimates. This approach expresses all variables as deviations from the mean investor (or exporter) or, alternatively, the mean host (or importer). Thus, for instance, two equations for bilateral FDI outstocks are obtained: a "country" equation, in which bilateral outstocks and all explanatory variables are expressed as deviations from their values for the average investor; and a "partner" equation, in which bilateral outstocks and all explanatory variables are expressed as deviations from their values for the average host. The advantage is that in the country equations partner-specific unobserved effects (and common time trends) are accounted for prior to estimation in a non-parametric way and only country-specific effects have to be estimated, while in the partner equations it is the country-specific unobserved effects (and common time trends) that are accounted for non-parametrically and the partner-specific effects that are estimated. This reduces the number of parameters to be estimated in each equation.* The downside is that, due to the transformation of the data, no time-invariant partner-specific variables can be included in the country equations and, symmetrically, no time-invariant country-specific variables can be included in the partner equations. Finally, additional degrees of freedom are gained by assuming that, in each of the two equations, the incremental information provided by the unobserved country pair effect over the "pure" country or partner effect is random and can be included in the error term.

Total instock equations are estimated using a panel data procedure that controls for the possible inconsistency of estimates implied by the presence of the lagged dependent variable and the potential endogeneity of some of the explanatory variables (Bond, 2002). To this end, the equations are first-differenced, the lagged dependent variable and endogenous explanatory variables are instrumented by the lagged values of the variables themselves and the parameters are estimated applying a generalised method of moments procedure (Arellano and Bond, 1991). Serial correlation tests and Sargan tests for over-identifying restrictions were performed to ensure that the regression specifications reported in the main text were supported by the data.

* To check the robustness of regression results to this transformation, each equation was also estimated using a standard fixed effects regression, including all unobserved effects save the country-partner pair effects.

© OECD 2003

Table 2. **Non-policy-related structural factors impinging on trade and FDI**

Dependent variable (ln)	Export of:				FDI		
	Goods		Services		Outstock		Total instock
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]		Multilateral dynamic IV[2]
	Country	Partner	Country	Partner	Country	Partner	
Total GDP[3]	1.284	0.78	1.926	1.677	1.928	1.903	0.135
	[14.95]**	[9.19]**	[11.49]**	[13.66]**	[4.89]**	[5.37]**	[2.02]*
Size similarity	0.627	0.38	0.948	0.694	1.436	1.247	
	[11.89]**	[7.47]**	[9.70]**	[9.22]**	[7.50]**	[7.22]**	
Factor dissimilarity	0.084	0.046	0.386	0.032	–0.199	–0.43	
	[2.64]**	[1.50]	[1.41]	[0.30]	[3.18]**	[7.05]**	
Human capital dissimilarity	0.415	0.338	–0.177	0.66	–2.122	–2.153	
	[2.63]**	[2.51]*	[0.29]	[1.19]	[9.43]**	[10.28]**	
Human capital endowment							1.873
							[4.38]**
Transport costs	–0.813	–0.792			–0.722	–0.506	
	[18.02]**	[18.64]**			[5.95]**	[3.86]**	
Distance	–1.106	–1.126	–0.843	–0.762			
	[27.74]**	[30.63]**	[10.47]**	[10.34]**			
R&D intensity	0.107						0.36
	[3.79]**						[5.42]**
Bilateral exchange rate	–0.583	–0.237			0.637	–0.701	
	[11.14]**	[4.40]**			[3.78]**	[4.34]**	
Effective exchange rate							0.005
							[4.70]**
Exchange rate variability[4]					–0.003	–0.002	
					[1.94]	[1.65]	
Lagged dependent variable							0.688
							[17.11]**
Constant	1.92	0.96	–0.60	–0.10	–2.13	–1.06	0.00
	[9.58]**	[5.92]**	[4.94]**	[0.98]	[4.31]**	[2.76]**	[0.34]

© OECD 2003

© OECD 2003

Table 2. **Non-policy-related structural factors impinging on trade and FDI** (*cont.*)

Dependent variable (ln)	Export of:				FDI		
	Goods		Services		Outstock		Total instock
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]		Multilateral dynamic IV[2]
	Country	Partner	Country	Partner	Country	Partner	
Notes:	28 countries and partners		17 countries, 26 partners		28 countries and partners		19 countries
Period	1980-2000		1999-2000		1980-2000		1980-2000
Observations[5]	7 780	7 768	540	534	4 521	4 517	174
R-squared[6]	n.a.	n.a.	n.a.	n.a.	0.72	0.65	n.a.
Country effects	Yes	Implicit	Yes	Implicit	Yes	Implicit	Yes
Partner effects	Implicit	Yes	Implicit	Yes	Implicit	Yes	
Common time trend	Implicit	Implicit	Implicit	Implicit	Implicit	Implicit	
Country-specific trend	Yes	Implicit	n.a.	n.a.	Yes	Implicit	
Partner-specific trend	Implicit	Yes	n.a.	n.a.	Implicit	Yes	
Bilateral effect	Random	Random	Random	Random	Fixed	Fixed	
Sargan test[7]							224 (340)
Autocorrelation in first-differenced residuals							
First-order[8]							–3.940
Second-order[8]							–2.160

Absolute value of t or z-statistics in brackets. * significant at 5% level; ** significant at 1% level; n.a. = not applicable.

1. Equations estimated using the Transformed Least Squares (TLS) approach (Erkel-Rousse and Mirza, 2002). "Country" indicates the use of data expressed as deviations from the mean host that allows for estimation of investor-specific variables, "partner" indicates the use of data expressed as deviations from the mean investor that allows for estimation of host-specific variables.
2. The dynamic panel specification was estimated using the Arellano and Bond (1991) generalized method of moments estimator.
3. Defined as domestic absorption in the total instock regressions.
4. Coefficients multiplied by 100.
5. Samples are adjusted for outliers based on the Welsch distance cut-off (Chaterjee and Hadi, 1988).
6. The R-squared is reported only in fixed effects regressions.
7. The Sargan statistic tests the null hypothesis that all moment conditions are satisfied. The statistic is X^2-distributed with degrees of freedom in parenthesis.
8. These tests check the assumption that residuals are serially uncorrelated. This assumption implies that their first differences follow an MA(1) process having non-zero first-order correlation but no higher-order correlation. Reported statistics, both distributed N(0,1), test the null hypothesis of zero first-order and second-order autocorrelation, respectively.

Source: OECD.

- Fourth, the sizeable coefficient estimate for the lagged FDI instock in the dynamic total instock regressions suggests that there is a high persistence present in the data, with FDI flowing to countries that already have relatively high bilateral instocks. This phenomenon may reflect the presence of "agglomeration effects", whereby FDI is attracted to locations in which important investments by home country MNEs have already been made (see, for related evidence, Barrell and Pain, 1998 and 1999).[49]

R&D intensity in the home and partner countries and the level and volatility of bilateral and effective exchange rates have the expected influence on trade and FDI. R&D in the home country is a common proxy for product differentiation, which positively affects intra-industry trade. At the same time, the overall level of R&D expenditure in the host country increases its attractiveness for total inward FDI. For given relative prices (whose effect is captured by relative factor endowments and, in later regressions, by the product and labour-market regulation variables), an exchange rate appreciation curbs the competitiveness of home country exports of goods, as pointed out by the negative and significant estimates of its coefficient in bilateral export equations. However, it has two opposing effects on FDI. On the one hand, it reflects a pure valuation effect, with the US$ value of assets held by the home country in the host country decreasing; on the other hand, it reflects an asset effect, increasing the attractiveness of investment in the host country, as its assets become cheaper for foreigners. The results are ambiguous. The estimated effects change sign across bilateral FDI specifications, though the valuation effect seems to prevail in most regressions (see Nicoletti *et al*, 2003). At the multilateral level (as captured by the dynamic total instock regressions), the asset effect seems to prevail, perhaps due to composition effects.[50] The effects of exchange rate variability are discussed below.

The direct and indirect influence of policies

Table 3 reports the results of regressions that include policy variables. The reported specifications generally include all of them. However, some policy variables are sometimes omitted when the inclusion of all variables would imply either significant changes in country coverage (such as in the total instock equations) or excessive multicollinearity (such as in the cross-section services trade regressions). Most of the variables are expressed in ratios, but country or partner-specific policy variables in trade equations are expressed in level terms in line with trade literature (*e.g.* Helpman and Krugman, 1995) To highlight similarities and differences in the way policies may influence trade in goods, trade in services and bilateral or multilateral FDI, it is useful to look at the estimated effects of each policy across the different measures of trade and FDI. Therefore, the effects of each of the four sets of policies covered in this paper are analysed in turn under the usual headings.

© OECD 2003

Openness

FDI restrictions by the partner are estimated to have a significant negative impact on bilateral FDI outstocks (Table 3, Panel A). For instance, the semi-elasticity estimates imply that such barriers could be depressing FDI outstocks by between 10 and 80 per cent, depending on the restriction considered (see Table 4).[51] FDI restrictions are also found to significantly depress the inward position of a host country in the dynamic total instock regressions, which are based on a smaller set of OECD countries. However, this effect appears to be sensitive to changes in the country coverage, probably due to a relative lack of variability of restrictions across subsets of OECD countries, and to the inclusion of additional policy variables in the regression, reflecting the close correlation between FDI and product-market liberalisation over the sample period.

Similarly, border barriers directly affect trade in goods (Table 3, Panel B). Applied bilateral tariff rates have a significant negative effect on exports, with the estimated elasticities implying around 1 per cent increase in exports as tariffs decline by 1 percentage point. Moreover, the estimates suggest that a decrease by 1 percentage point of the import coverage of (multilateral) non-tariff barriers in the partner may also increase bilateral exports of the home country by around 1 per cent. These results should be interpreted with caution because, due to data limitations, both the tariff and non-tariff measures are not fully appropriate: applied bilateral tariffs are available for only one recent year, and cover therefore only the cross-section dimension, while the available non-tariff measures are multilateral, and therefore do not accurately account for the influence of border barriers on bilateral trade.[52]

Table 3 also reports estimates of the potential cross-effects of border barriers on trade and FDI. To this end, tariff and non-tariff barriers were included in the FDI equations (to test for the tariff- jumping hypothesis) and, conversely, FDI restrictions were included in the trade equations. Estimation results for bilateral FDI outstocks and, especially, total instock equations provide some evidence that FDI may be aimed at bypassing non-tariff barriers, which often establish limits to market access (*e.g.* quotas), rather than tariff barriers, which generally add to the cost of trade without necessarily foreclosing exports. Indeed, tariff barriers appear to have a negative effect on FDI outstocks, perhaps reflecting their discouraging effect on the intra-firm trade related to vertical FDI. Some evidence of cross-effects is also found in services trade equations, with FDI restrictions negatively affecting trade in some regressions, perhaps reflecting the complementarity between commercial presence and consumption abroad or cross-border supply for some services (*e.g.* tourism). Cross effects are not found for exports of goods, suggesting that goods trade is not frequently resorted to as a means of bypassing FDI restrictions.

As regards FTAs, the empirical analysis considered the impact of different situations of the home and partner countries: *i*) the two countries belong to *any* FTA;

© OECD 2003

Table 3.*a*. **The influence of policies on foreign trade and investment**

Dependent variable (ln)	FDI				
	Outstock		Total instock		
Specification	Bilateral TLS[1]		Multilateral Dynamic IV[2]		
	Country	Partner			
Total GDP[3]	3.342	1.328	0.283	0.389	0.363
	[8.39]**	[3.78]**	[3.76]**	[5.01]**	[4.56]**
Size similarity	2.187	0.968			
	[11.43]**	[5.64]**			
Factor dissimilarity	–0.059	–0.794			
	[0.63]	[6.90]**			
Human capital dissimilarity	–0.844	–1.383			
	[3.57]**	[6.08]**			
Human capital endowment			1.248	0.658	1.219
			[2.83]**	[1.42]	[2.67]**
Transport costs	–0.662	–0.743			
	[5.39]**	[6.14]**			
R&D intensity			0.323	0.403	0.485
			[4.93]**	[5.71]**	[6.66]**
Bilateral exchange rate	0.283	–0.97			
	[1.61]	[5.70]**			
Effective exchange rate			0.004	0.003	0.004
			[4.15]**	[3.33]**	[3.70]**
Exchange rate variability[4]	0.024	–0.0001	–0.008	–0.008	–0.011
	[5.45]**	[1.23]	[1.33]	[1.47]	[1.80]
Lagged dependent variable			0.626	0.558	0.519
			[15.19]**	[12.42]**	[10.98]**
Free trade area	0.366	0.482			
	[5.22]**	[5.84]**			
FDI restrictions		–0.019	–0.007	–0.002	0.006
		[3.06]**	[2.62]**	[0.50]	[1.58]
Bilateral tariff barriers	–0.1	–0.059			
	[6.08]**	[4.07]**			
Non-tariff barriers		0.011	0.112	0.143	0.166
		[1.89]	[3.55]**	[4.44]**	[4.89]**
Employment protection ratio[9]	–0.032	–0.053		–0.007	–0.007
	[2.62]**	[5.37]**		[2.91]**	[2.46]*
Labour tax wedge ratio[9]	–0.925	–2.297		–0.005	–0.008
	[9.20]**	[11.65]**		[1.10]	[1.75]
Regulation ratio[9]	–0.142	–0.1		–0.006	–0.010
	[8.25]**	[6.11]**		[1.53]	[2.53]*
Infrastructure			0.008	0.013	0.006
			[2.12]*	[2.92]**	[1.35]
Constant	–0.87	–3.29	–0.008	–0.007	0.009
	[1.75]	[7.97]**	[1.07]	[0.88]	[1.04]

© OECD 2003

Table 3.*a*. **The influence of policies on foreign trade and investment** (*cont.*)

Dependent variable (ln)	FDI				
	Outstock		Total instock		
Specification	Bilateral TLS[1]		Multilateral Dynamic IV[2]		
	Country	Partner			
Notes:	28 countries and partners		16 countries	14 countries	10 countries
Period	1980-2000		1980-2000		
Observations[5]	3 792	3 601	169	163	134
R-squared[6]	0.71	0.72	n.a.	n.a.	n.a.
Sargan test[7]			223 (340)	205 (693)	151 (338)
Autocorrelation in first-differenced residuals					
First-order[8]			–3.45	–3.30	–3.30
Second-order[8]			–1.93	–1.94	–1.73

Absolute value of t or z-statistics in brackets. * significant at 5% level; ** significant at 1% level.
n.a. = not applicable.
Country, partner, bilateral and time effects as in Table 2.
Notes 1-8 as in Table 2.
9. The ratio increases as employment protection, regulation or the labour tax wedge become more restrictive in the host country.
Source: OECD.

ii) the partner belongs to *any* FTA; *iii*) the two countries belong to the *same* FTA; *iv*) the two countries belong to the EU, NAFTA or EFTA; and *v*) the partner (but not the home country) belongs to the EU, NAFTA or EFTA. Only results concerning the latter three situations and, for services trade regressions, membership in the EU or NAFTA are reported, since the dummies for membership of both countries or the partner in any FTA were insignificant in most cases. The analysis of situations *iv*) and *v*) omitted policy variables unrelated to openness to avoid multicollinearity problems, but the results are broadly unchanged in specifications including all policy variables. The three main findings were:

1. Membership in the *same* FTA increases both exports of goods and FDI outstocks (Table 3);
2. Bilateral exports of goods and outward FDI to partners belonging to a different FTA tend to increase only when the partner is a EU country (Table 5);
3. The effect of FTA membership on exports of services is insignificant. In particular, close integration under the Single Market Programme does not appear to have boosted services trade among EU countries (Table 5).

Thus, FTAs that eliminate border barriers appear to be unsuccessful in raising services trade, perhaps because the latter is often impeded by non-border barriers.

© OECD 2003

Table 3.*b*. **The influence of policies on foreign trade and investment**

Dependent variable (ln)	Export of						
	Goods		Services				
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]
	Country	Partner	Country	Partner	Country	Partner	Partner
Total GDP	1.006	0.747	1.759	1.614	1.569	1.464	1.623
	[11.15]**	[8.77]**	[29.53]**	[31.88]**	[27.51]**	[27.22]**	[11.31]**
Size similarity	0.539	0.44	0.897	0.676	0.803	0.571	0.659
	[9.52]**	[8.19]**	[13.31]**	[11.94]**	[13.41]**	[9.97]**	[7.80]**
Factor dissimilarity	0.153	0.112	0.26	0.193	0.137	0.198	0.099
	[3.87]**	[2.72]**	[1.93]	[1.67]	[0.97]	[1.36]	[0.92]
Human capital dissimilarity	0.54	0.46	–0.788	–0.852	–0.415	0.31	0.729
	[2.80]**	[2.69]**	[2.24]*	[2.21]*	[1.08]	[0.70]	[1.25]
Distance	–0.972	–0.991	–0.928	–0.806	–0.895	–0.795	–0.751
	[18.18]**	[20.63]**	[19.44]**	[18.81]**	[23.42]**	[19.36]**	[7.43]**
Transport costs	–0.71	–0.683					
	[11.37]**	[11.75]**					
R&D intensity	0.208						
	[7.89]**						
Bilateral exchange rate	–0.489	–0.285					
	[8.33]**	[5.53]**					
Free trade area	0.109	0.134					–0.02
	[4.77]**	[4.96]**					[0.07]
FDI restrictions		–0.039					–0.399
		[0.84]					[3.03]**
Bilateral tariff barriers	–0.137	–0.145					
	[3.69]**	[4.08]**					
Non-tariff barriers		–0.08					
		[4.23]**					
Country or partner-specific policy variables							
Regulation	–0.253	–0.118					
	[3.85]**	[2.06]*					
Labour tax wedge	–0.399	0.194	–0.608	–0.726			
	[5.54]**	[2.94]**	[3.83]**	[4.70]**			

© OECD 2003

© OECD 2003

Table 3.*b*. **The influence of policies on foreign trade and investment** (*cont.*)

Dependent variable (ln)	Export of						
	Goods		Services				
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]
	Country	Partner	Country	Partner	Country	Partner	Partner
Employment protection					–0.011	–0.022	
					[4.85]**	[8.10]**	
With high-level corporatism	0.002	0.001			0.034	0.01	
	[1.85]	[0.92]			[4.34]**	[1.86]	
With mid-level corporatism	–0.003	–0.002			–0.011	–0.003	
	[2.52]*	[1.43]			[1.47]	[0.32]	
With low-level corporatism	0.001	–0.001					
	[0.60]	[0.80]					
Combined country/partner policy variables							
Regulation[7]			–0.258	–0.241	–0.236	–0.258	
			[2.57]*	[2.26]*	[2.18]*	[2.18]*	
Transport infrastructure[7]			0.212	0.365			
			[2.39]*	[5.70]**			
Constant	1.50	1.21	–0.63	–0.06	–0.53	0.09	–0.11
	[6.20]**	[6.98]**	[10.39]**	[1.57]	[11.02]**	[1.88]	[1.06]
Notes:	28 countries and partners		17 countries and 26 partners				
Period	1980-2000		1999-2000				
Observations[5]	6 107	6 119	480	477	435	432	519
R-squared[6]	n.a.	n.a.	0.79	0.76	0.79	0.76	n.a.

Absolute value of t-statistics in brackets. * significant at 5% level; ** significant at 1% level; n.a. = not applicable.
Country, partner, bilateral and time effects as in Table 2.
Notes 1, 5 and 6 as in Table 2.
7. Product of indicators in home and host countries.
Source: OECD.

Table 4. **FDI positions: the hypothetical effect of removing FDI restrictions**[1]
Average across countries

	Per cent change in inward FDI position
Removal of foreign equity ceilings	77.9
Removal of approval and national interest tests	21.2
Easing of nationality requirements on management[2]	10.1

1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
2. From majority of domestic managers to only one or more domestic managers.

Source: OECD.

Moreover, FTAs appear to benefit principally goods trade among their members, but have little impact on trade with third-party countries (independent of their membership in another FTA), except when trading with a EU member. While FTAs also benefit FDI among their members, FDI outstocks are stimulated as well when the partner belongs to the European Union, though this effect is only weakly significant. In other words, the European Union appears to be more attractive for third-party FDI and exports than other FTAs, such as NAFTA. This may be related to lower average tariffs, closer integration (*i.e.* a custom union *versus* a free-trade area) in the Single Market and/or the different role played by rules of origin in the two areas.[53]

Exchange rate variability can be interpreted as capturing the effect of economic unions to the extent that these generally require stable exchange rate arrangements or a single currency. In most regressions, a reduction of both bilateral and multilateral exchange rate volatility tends to increase FDI in the host country. Though this effect is not significant at conventional levels in the regressions reported in Tables 3 and 5, it is significant in other bilateral and multilateral specifications of the FDI outstock and outflow equations (see Nicoletti *et al.*, 2003). In some specifications, however, the sign is reversed, suggesting a positive relationship between exchange rate volatility and FDI, and no effects of volatility could be found on goods or services exports (the variable was therefore omitted from the preferred bilateral trade specifications reported in the tables). Whether currency unions stimulate economic integration among their members remains, therefore, a largely unresolved empirical issue.

Product-market regulation

Product-market regulations that curb competition are estimated to have a negative and significant effect on both trade and FDI (Table 3). However, the results suggest that they do so in different ways for FDI, trade in goods and trade

© OECD 2003

in services. What is relevant for bilateral FDI outstocks is the ratio of the regulatory indicators in the host and home countries. As regulation in the host country becomes more restrictive than regulation in the home country, outstocks of the latter decrease. This is confirmed by the significantly negative impact of anti-competitive regulations in the host country (relative to the OECD average) on its total FDI instock.[54] Put simply, the net effect of regulations that curb competition is to make the host country less attractive for international investors located in countries where regulations are less restrictive. No robust effect of the lack of intellectual property rights protection in the host country could be found on FDI outstocks, perhaps due to the crude proxy used to test for this potential effect of policies, which varies only in the cross-section dimension.[55] Hence, this variable was omitted from the preferred specifications reported in Table 3.

Conversely, what is most relevant for bilateral exports of goods is the level of regulation in the home country, which increases production costs, curbing the competitiveness of exports, distorts relative prices and possibly reduces also opportunities for intra-industry trade by narrowing product variety. To a lesser extent, regulations in the partner countries also tend to depress exports, suggesting that their effect on market access dominates the possible stimulating effect on the competitiveness of foreign *versus* home goods.

Finally, estimation results point to an identical effect of regulations in the home and the partner country on bilateral services exports. In other words, statistical tests suggest that it is the *product* of the regulatory indicators in the two countries that has a negative and significant effect on services trade. This probably reflects the need for using efficiently inputs in both countries to produce many of the services that are traded (*e.g.* travel, freight, tourism, communication, banking). Moreover, regulation is estimated to have a stronger impact on services trade, as measured by the size of the estimated coefficient, than on both goods trade and FDI. The fact that anti-competitive regulations are generally more widespread in services, that these regulations combine in both the exporter and importer countries to lower service exports and that their combined impact is stronger than in goods trade, could contribute to explain not only cross-country patterns of services trade but also observed differences in trade intensities of goods and services.

Labour-market arrangements

The tax wedge on labour income appears to influence FDI in much the same way as anti-competitive regulation. What appears to be relevant for bilateral FDI outstocks is the ratio between wedges in the partner and the home country: the higher this ratio, the lower the outstock of FDI from the home country to the partner. This latter result is only partially confirmed by the dynamic total instock estimates, in which the wedge is estimated to have a negative, but weakly significant,

© OECD 2003

Table 5. **The influence of free-trade agreements**

Dependent variable (ln)	FDI		Exports of			
	Outstock		Goods		Services	
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]	
	Country	Partner	Country	Partner	Country	Partner
Total GDP	1.89	1.918	1.33	0.662	1.999	1.692
	[4.86]**	[5.42]**	[14.59]**	[7.74]**	[14.57]**	[18.21]**
Size similarity	1.414	1.255	0.702	0.369	0.981	0.71
	[7.51]**	[7.25]**	[12.94]**	[6.98]**	[12.20]**	[9.57]**
Factor dissimilarity	–0.176	–0.395	0.164	0.12	0.444	0.259
	[2.79]**	[6.41]**	[4.36]**	[3.27]**	[1.60]	[2.78]**
Human capital dissimilarity	–1.906	–1.934	0.216	0.093	–0.152	0.571
	[8.56]**	[9.34]**	[1.26]	[0.62]	[0.23]	[0.98]
Transport costs	–0.693	–0.479	–0.749	–0.72		
	[5.75]**	[3.74]**	[13.74]**	[14.16]**		
Distance			–1.042	–1.058	–0.844	–0.73
			[20.97]**	[22.14]**	[7.44]**	[6.84]**
R&D intensity			0.119			
			[4.12]**			
Bilateral exchange rate	0.711	–0.718	–0.58	–0.346		
	[4.26]**	[4.47]**	[10.20]**	[6.39]**		
Exchange rate variability[4]	–0.003	–0.002				
	[1.50]	[1.26]				
FDI restrictions				–0.107		–0.139
				[2.33]*		[1.00]
Bilateral tariff barriers			–0.097	–0.105		
			[2.31]*	[2.69]**		
Non-tariff barriers				–0.074		
				[3.78]**		
Infrastructure					0.355	0.381
					[1.59]	[3.19]**
European Union	0.529	0.808	0.058	0.163	0.194	0.26
	[7.73]**	[3.89]**	[1.85]	[3.34]**	[0.83]	[0.74]
NAFTA	1.578	1.754	0.485	0.495	–0.367	–0.508
	[7.37]**	[7.69]**	[2.43]*	[3.58]**	[1.21]	[1.54]
EFTA	0.466	0.5	0.183	0.239		
	[2.53]*	[1.49]	[3.12]**	[3.12]**		
Partner in:						
European Union		0.376		0.144		
		[1.79]		[3.16]**		
NAFTA		–0.048		0.033		
		[0.27]		[0.64]		
EFTA		0.264		0.027		
		[0.98]		[0.46]		
Constant	–2.21	–0.85	2.08	0.82	–0.70	–0.09
	[4.53]**	[2.05]*	[9.94]**	[4.76]**	[4.65]**	[1.31]

© OECD 2003

Table 5. **The influence of free-trade agreements** (*cont.*)

Dependent variable (ln)	FDI		Exports of			
	Outstock		Goods		Services	
Specification	Bilateral TLS[1]		Bilateral TLS[1]		Bilateral TLS[1]	
	Country	Partner	Country	Partner	Country	Partner
Notes:	28 countries and partners		28 countries and partners		17 countries and 26 partners	
Period	1980-2000		1980-2000		1999-2000	
Observations[5]	4 521	4 517	6 958	6 945	525	519
R-squared[6]	0.73	0.66	n.a.	n.a.	n.a.	n.a.

Absolute value of t or z-statistics in brackets. * significant at 5% level; ** significant at 1% level; n.a. = not applicable.
Country, partner, bilateral and time effects as in Table 2.
For notes 1, 4, 5 and 6: see Table 2.
Source: OECD.

impact on the ability of the host country to attract OECD-wide FDI. As with product-market regulation, bilateral exports of goods are significantly depressed by a high tax wedge in the home country, suggesting that its impact on production costs is not fully offset by wages. In this case, however, a symmetric (though weaker) reverse effect is found for a high tax wedge in the partner, which *ceteris paribus* raises the competitiveness of the home country exports. Finally, high tax wedges in both the home country and the partner are estimated to have depressing effects on bilateral service exports, confirming that traded services may use labour inputs in both countries involved in the transaction.[56]

Results for EPL are similar but more nuanced, because some of them depend on the bargaining regime in place in the home country and the partner. The effect of EPL on bilateral FDI outstocks and total FDI instocks mirrors that of anti-competitive regulations and wedges: host countries in which EPL is stricter than in their investing partners tend to attract significantly less FDI. Here, the bargaining regime plays no moderating role, perhaps due to the influence of EPL regimes on the risk-adjusted returns to foreign investment or differential information costs for domestic and foreign investors (see above). On the other hand, strict EPL in the home country depresses goods exports by increasing production costs, thus curbing the competitiveness of exported goods, and distorting relative prices, but only in countries where industry-level bargaining (labelled "mid-level corporatism" in Table 3) discourages the shift of those costs to wages. At the same time, no effect of strict EPL in the partner is found, independent of the level of corporatism.

© OECD 2003

Finally, in services trade strict EPL in the home country and the partner both have a negative effect on exports, further confirming the pattern already observed for regulation and wedges. However, this effect vanishes in highly corporatist home countries.

Infrastructure

Table 3 looks only at the influence of infrastructure provision on FDI and trade in services, because the role of infrastructure for trade in goods is indirectly captured by transport costs and, therefore, is not modelled explicitly.[57] Even though the coefficient estimated for infrastructure has the expected sign, the estimation results provide little evidence that the quality and quantity of infrastructure in the partner, as captured by the indicator described in the previous section, significantly affects bilateral patterns of FDI . Therefore, this variable was omitted from the "preferred" specifications reported in Table 3. The lack of any definite result for this variable may also be related to its potential endogeneity to FDI (see above). Indeed, total instock regressions, which control for endogeneity through instrumental variable estimation, suggest that infrastructure tends to improve the overall attractiveness of a host country for international investors, though this result is sensitive to changes in country coverage.[58] Moreover, transport infrastructure is estimated to have a sizeable and significant positive effect on trade in services. Here, infrastructure in both the country and partner is relevant for trade and, therefore, transport infrastructure is defined as the product of the indicator values in the two countries.[59] The results suggest that the elasticity of bilateral service exports with respect to transport infrastructure provides a significant offset to the negative effect of distance. Poor or inefficient infrastructure is therefore a supplementary explanation of both cross-country services trade patterns and the relatively low trade intensity observed in the service sector.

Summing up

Empirical results broadly support the influences expected from both non-policy related and policy factors on trade and FDI. The main insights are the following:

- Gravity forces affect trade and FDI in the same way. However, the effect of market size and transport costs on FDI and trade in services is, respectively, stronger and weaker than in goods trade. Thus, economic and geographic considerations alone are unable to explain the significant difference in the intensity of trade in goods and services.
- Border barriers have a direct depressing effect on both trade and FDI, but there is also evidence that MNEs may be able to bypass non-tariff barriers, which limit the access of exporters to local markets, by increasing the activity of their foreign affiliates in these markets. Conversely, no such bypass

© OECD 2003

seems to occur for tariff barriers, which raise the cost of trade for both exporters and vertical MNEs.

- Participation in a FTA enhances trade and FDI amongst its members, but the only FTA that appears to have benefited also from an increase in trade and FDI from third parties is the European Union, perhaps due to its closer degree of integration. Moreover, FTAs do not appear to have affected positively services trade among their members, which might be due to limited coverage of the agreements and remaining non-border barriers.
- There is some evidence that the supply of high quality infrastructure enhances the overall appeal of a host country with respect to inward FDI. Moreover, good infrastructure conditions in both the home country and partner have a powerful positive effect on services exports.
- Anti-competitive regulations curb FDI and trade, with a particularly strong negative effect on services trade, which is sensitive to regulatory conditions in both the home country and the partner.
- High tax wedges on labour income and strict EPL also curb FDI and trade, but the effect of EPL on trade depends on the bargaining regime. Again, services trade is particularly sensitive to conditions in both the home country and the partner.
- Taken together, the results for services trade suggest that poor or inefficient infrastructure, lack of competitive pressures and adverse labour-market arrangements in trading partners could contribute to explain the low services trade intensities relative to goods trade observed in many OECD countries.

HOW DO POLICIES SHAPE TRADE AND FDI PATTERNS?

The impact of policies on trade and FDI is significant, but how much of the observed differences in bilateral trade and FDI transactions among OECD countries can actually be explained by differences in policies? What are the policies that play the largest role in explaining such differences? What would be the effect of changing policies on trade and FDI? Bearing in mind the illustrative nature of any policy simulation based on regression results, empirical estimates can be used to provide tentative answers to these questions.[60] Specifically, this section quantifies *i*) the relative contributions of policies and other factors to the observed deviations of exports (of goods and services) and FDI from OECD averages; and *ii*) the long-run impact on total FDI instocks and export flows of changes in policies that affect border barriers, labour taxation and product-market regulation. It is important to notice that the quantitative effects highlighted in the policy

© OECD 2003

simulations depend on the specification of the estimated models as well as on the configuration of policies and the distribution of FDI stocks and trade flows in the baseline scenario. This is particularly the case for simulations concerning domestic regulatory policies in product and labour markets. Finally, given the specification of some of the policy variables, which entail a comparison between policies of the home country and the partner, diversion effects are not taken into account. To the extent that these effects are important, the simulation results may overestimate the effects of policy changes on the variables of interest.

Accounting for cross-country patterns of trade and FDI

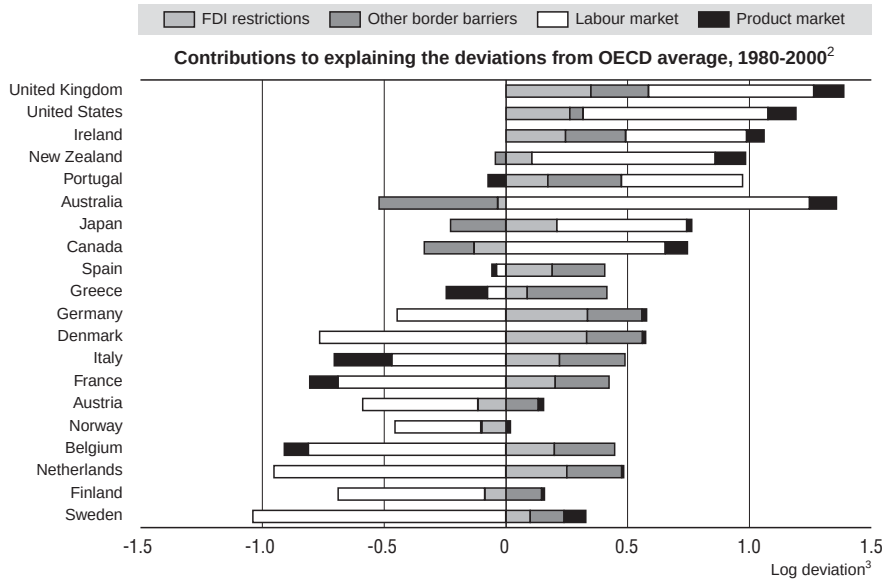
Figures 19-21 show the contributions of policies to the deviation (in logarithms) of total FDI instocks, services exports and goods exports in each country from the OECD average over the 1990s. The figures also show how much of these deviations is explained on average by non-policy-related factors – including gravity forces, factor endowments and all effects that are not accounted for by the policy and non-policy-related variables in the regressions (*i.e.* the country and partner-specific fixed effects and the bilateral effects) – and the unexplained regression residual.[61] The decompositions shown in the figures are based on the results of the bilateral equations averaged over the estimation period and investor countries (for FDI instocks) or importer countries (for exports of goods and services). The precise specifications on which the simulations are based are reported in the figures.

Policies influence bilateral FDI positions across member countries almost as much as all other ("non-policy") factors taken together (Figure 19).[62] The most important policy effects come from labour-market arrangements and openness factors. A more detailed analysis shows that the labour tax wedge is the most influential component of these arrangements, with EPL playing a lesser role. Anti-competitive product-market regulations explain a smaller part of the deviations of FDI instocks from the OECD average. However, these policy influences play different roles in different countries. For instance, while labour-market arrangements have a relatively positive influence on FDI instocks in English-speaking countries, Japan and Portugal, they tend to depress them in other European countries. Similarly, while in most European countries and the United States openness factors play a positive role, comparatively restrictive border measures depress FDI instocks relative to the OECD average in Canada, Australia and, to a lesser extent, Japan. The contribution of product-market regulation is significant for countries having either a relatively liberal approach (the United States, the United Kingdom, Australia, New Zealand, Canada and Sweden), where it pushes up relative FDI instocks, or a relatively restrictive approach (continental European countries), where it pulls down relative FDI instocks.

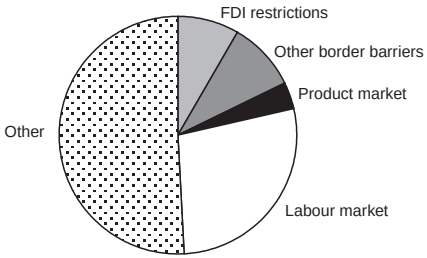
Policies also play an important (though smaller) role in explaining why services exports are above or below the OECD average (Figure 20). In this case, the

© OECD 2003

Figure 19. **Policies and inward FDI positions**[1]
Contributions to explaining the deviations from OECD average, 1980-2000[2]



Average contributions (absolute values)

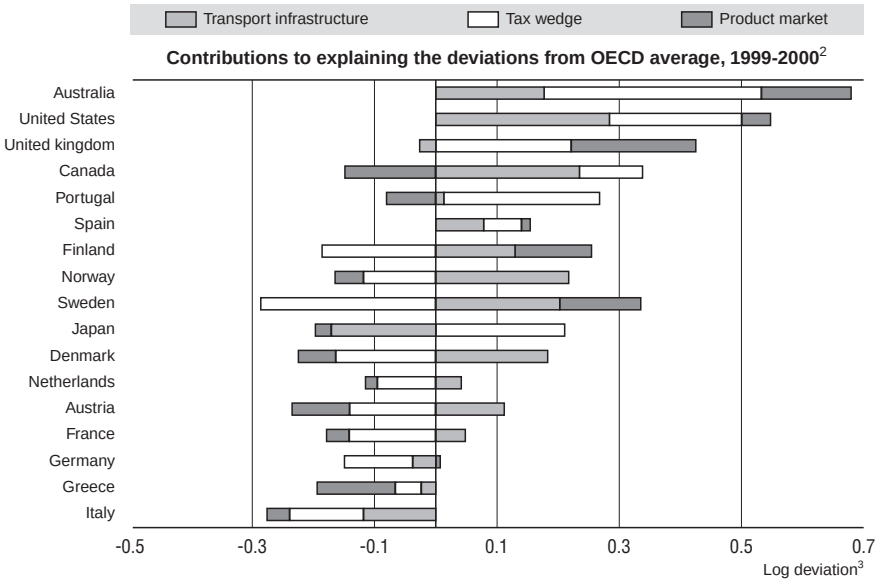


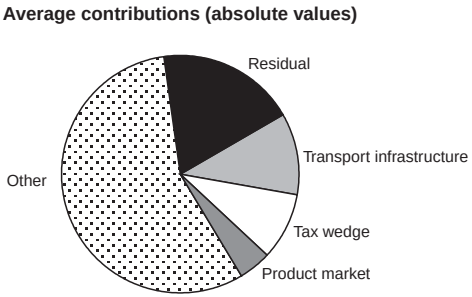
1. *Other border barriers* contains the contribution of tariff and non-tariff barriers of membership in a free-trade area. *Labour market* contains the contributions of the relative indicator of the tax wedge on labour income and of the relative indicator of employment protection legislation. *Product market* contains the contribution of the relative level of barriers to entry. *Other* include the contribution of the structural variables and dummy variables.
2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
3. Average is computed on countries included in the sample.

Source: OECD.

© OECD 2003

Figure 20. **Policies and services exports**[1]
Contributions to explaining the deviations from OECD average, 1999-2000[2]



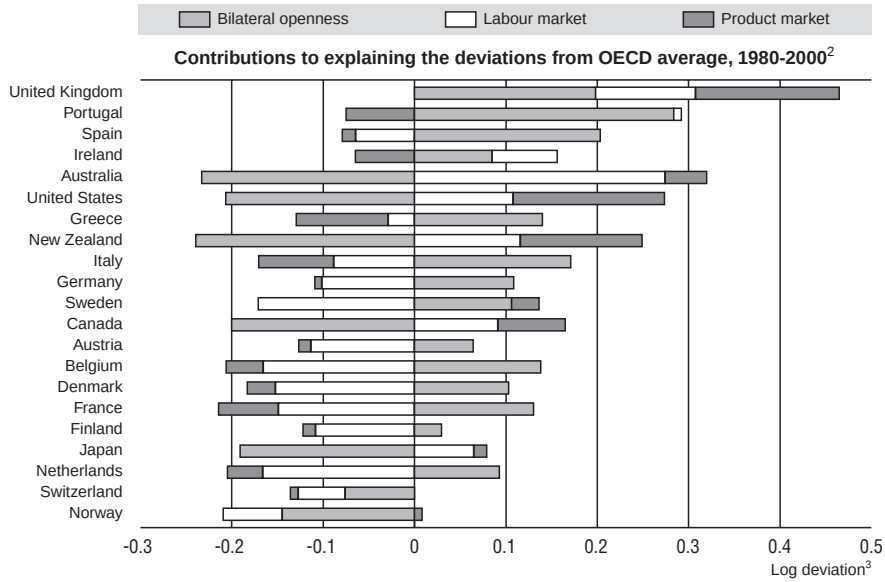


1. *Product market* contains the contribution of the level of barriers to entry. *Other* include the contribution of the structural variables and dummy variables. *Residual* contains the unexplained part of the variation.
2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
3. Average is computed on countries included in the sample.

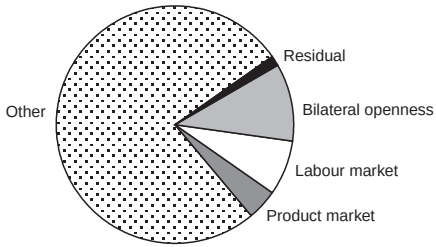
Source: OECD.

© OECD 2003

Figure 21. **Policies and goods exports**[1]
Contributions to explaining the deviations from OECD average, 1980-2000[2]



Average contributions (absolute values)



1. *Openness* contains the contributions of bilateral tariffs of membership in a free-trade area. *Labour market* contains the contributions of the relative indicator of the tax wedge on labour income and of the relative indicator of employment protection legislation. *Product market* contains the contribution of the relative level of barriers to entry. *Other* includes the contribution of the structural variables and dummy variables. *Residual* contains the unexplained part of the variation.
2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
3. Average is computed on countries included in the sample.

Source: OECD.

© OECD 2003

contribution of other factors is inflated by unexplained regression residuals, which are larger than for FDI. The contribution of policies to explaining services trade is more evenly distributed than for FDI among product-market regulation, the tax wedge, and infrastructure provision though the latter tends to predominate. The tax wedge favours services exports relative to the OECD average particularly in Australia, Japan, Portugal, the United Kingdom and the United States, while it penalises them in France, Austria, Finland, Denmark and, especially, Sweden. Having comparatively liberal product markets in services industries enhances services exports relative to the OECD average in the United Kingdom, Australia, Sweden, Finland and the United States, while relatively restrictive markets curb them in Canada, Greece, Portugal and Austria. Finally, relatively poor transport infrastructure endowments depress services exports in Japan and Italy, while its effect is either positive or close to zero in other countries.

Policies can explain only a relatively small part of the cross-country variance in goods exports (Figure 21). Most of this variance is explained by geographical and other non-policy-related factors (such as market size and distance from major OECD markets). The main policy influences come from bilateral openness (*e.g.* the border barriers faced by the exporter country when trading with its partners) and labour-market arrangements, while product-market regulations generally play a lesser role. Exports of EU countries are pushed up relative to the OECD average by bilateral openness with trading partners, which are mainly within the Single Market, while non-EU countries suffer from a relative lack of bilateral openness with respect to their EU trade partners. A closer look at the impact of policies in each country suggests that, in many cases, offsetting effects are at work. For instance, Australia, New Zealand, the United States, Canada and Japan are penalised by a relative lack of bilateral openness, but relatively liberal labour and/or product-market policies help to offset this negative bilateral openness. Conversely, while goods exports in European countries are stimulated by gravity factors, they are negatively affected by a relatively restrictive policy stance in labour and product markets. The only countries in which all policy factors depress goods exports relative to the OECD average are Switzerland and, to a lesser extent, Norway.

The impact of removing impediments to trade and FDI

The lifting of border and non-border barriers to trade and investment figures significantly on both national and international policy agendas (see, for instance, World Bank, 2002, 2003; and OECD, 2001d, 2003). To quantify the likely impact of such policy changes, the preferred equations described above have been used to simulate the following hypothetical policy scenarios:

- *Policies aimed at lifting border barriers*. These include *i*) the OECD-wide alignment of FDI restrictions and multilateral non-tariff barriers on those of the

© OECD 2003

least restrictive OECD country; *ii*) the alignment of bilateral tariff rates on those of the least restrictive trading partner or the least restrictive country pair; and *iii*) the accession to the European Union by the Czech Republic, Hungary and Poland;

- D*omestic competition-oriented policies in product markets* that result in an alignment of product-market regulations on those of the least restrictive OECD country;
- D*omestic labour tax reforms* that result in the alignment of the labour tax wedge on that of the OECD country with the lowest wedge.

Policies and FDI

Figure 22 (Panel A) shows the effect of bringing FDI restrictions in all OECD countries down to the level of restrictions in the United Kingdom, the least restrictive country according to the indicator described in Golub (2003). This move would require country-specific reforms that differ in content and scope depending on the patterns of FDI restrictions in place, but typically they would imply lifting screening requirements and restrictions on foreign shareholdings, and substantially reducing other restrictions (*e.g.* on the nationality of management, board composition and movement of people). The effects of such reforms on FDI instocks depend on how restrictive each country was before the policy move. Relatively restrictive countries could increase their total FDI instock by between 40 and 80 per cent, but even in countries that are estimated to be already relatively liberal the gains could amount to around 20 per cent of their initial instock.[63] Overall, such policy reforms could increase OECD-wide instocks by almost 20 per cent.

Reducing anti-competitive product-market regulations is also likely to increase significantly FDI instocks (Figure 22, Panel B). If all OECD countries were to reduce the level of their product-market regulations to that in the United Kingdom (the least restrictive country), OECD-wide instocks would increase by over 10 per cent relative to the initial instock. Since bilateral FDI outstocks are estimated to depend on the relative stringency of regulation in the home and host countries, relatively restrictive host countries – such as Greece, Italy and France – that host FDI from relatively liberal countries could increase their FDI instocks by as much as 60 to 80 per cent through regulatory reform. Conversely, countries that are relatively liberal would see the relative attractiveness of their product markets either unchanged (such as in the United States, New Zealand and Sweden) or even reduced (such as in the United Kingdom and Australia).

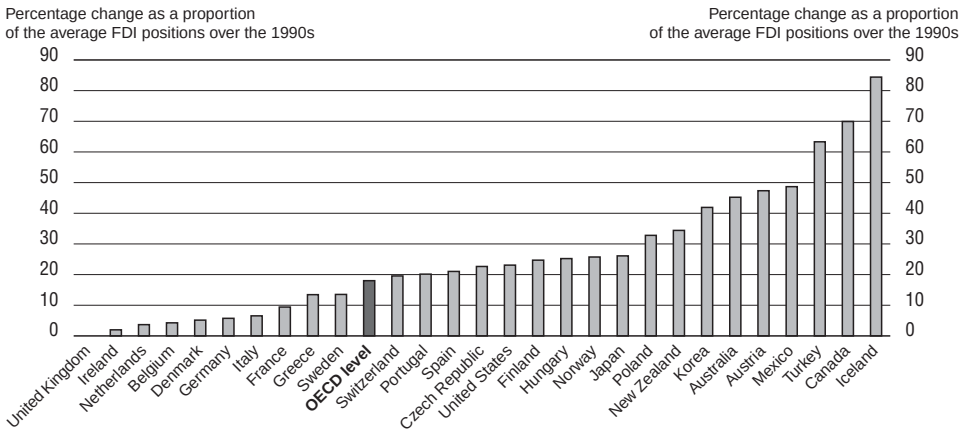
Policies and trade

Figure 23 looks at the effects of three different policies – reducing tariff and non-tariff barriers (panel A), liberalising product markets and reducing the tax wedge on labour income (panel B) – on country-specific and OECD-wide goods

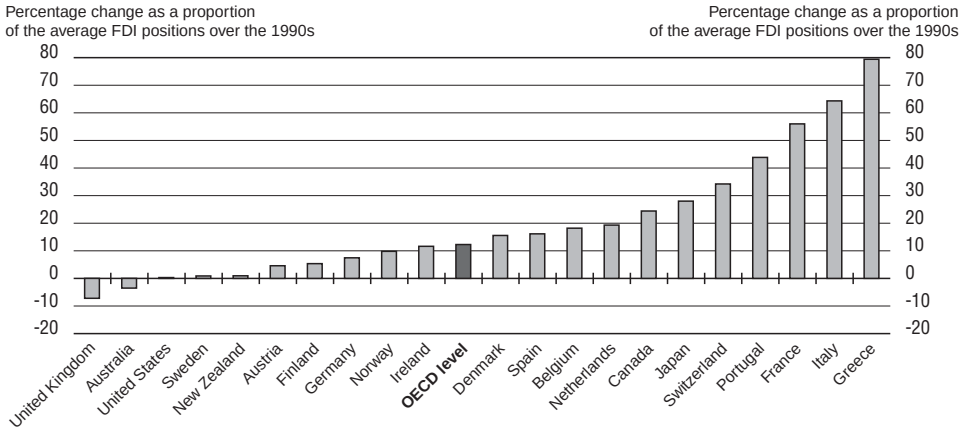
© OECD 2003

Figure 22. **Policies and inward FDI positions: the scope for further integration**[1]

A. Lifting FDI restrictions[2]



B. Easing product market regulations[2]

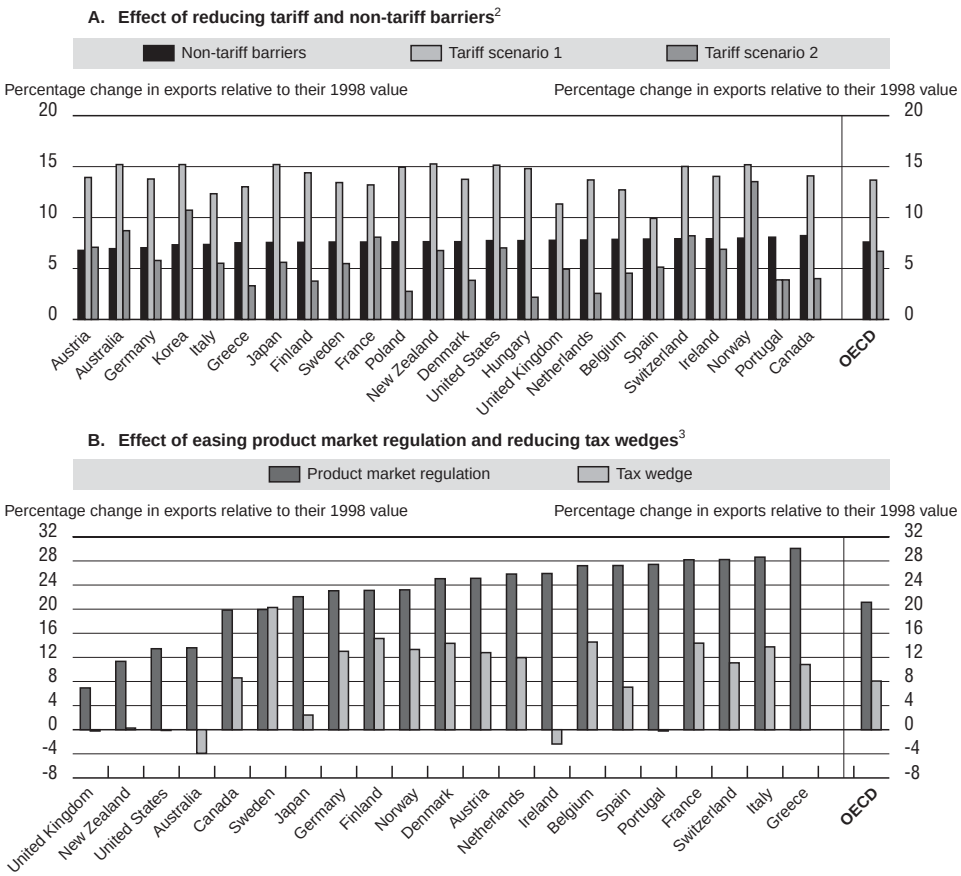


1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.

Source: OECD.

© OECD 2003

Figure 23. **Change in goods exports from reducing tariff and non-tariff barriers, product-market regulation and the tax wedge on labour income**[1]



1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
2. *Tariff scenario 1:* bilateral tariffs are reduced to the least restrictive average bilateral tariff in the OECD (0.057% in 2001). *Tariff scenario 2:* for each country bilateral tariffs are reduced to the least restrictive average tariff it faces when trading with its OECD partners in 2001. *Non-tariff scenario:* the import coverage of multilateral non-tariff barriers is aligned in all countries to that of the least restrictive country in 1996 (Iceland). For Iceland, simulations cannot be presented as this country is present in the sample only as a partner.
3. The simulation shows the effects of an easing of regulations in all countries to the level of the least restrictive country and a decrease in tax wedges to the level of the lowest wedge country in 2000 (Australia).

Source: OECD.

© OECD 2003

exports. Countries are ordered according to the cumulative gains obtained by implementing these policies. For bilateral tariffs, two scenarios are simulated: the decrease of tariffs to meet the lowest tariff among each country's trading partners; and the equalisation of all tariffs at the level of the lowest bilateral tariff observed in the OECD area. Consistent with regression results (see above), the liberalisation and labour tax reduction scenario take into account the cumulative effects on exports of policy changes in both the exporter and importer countries.

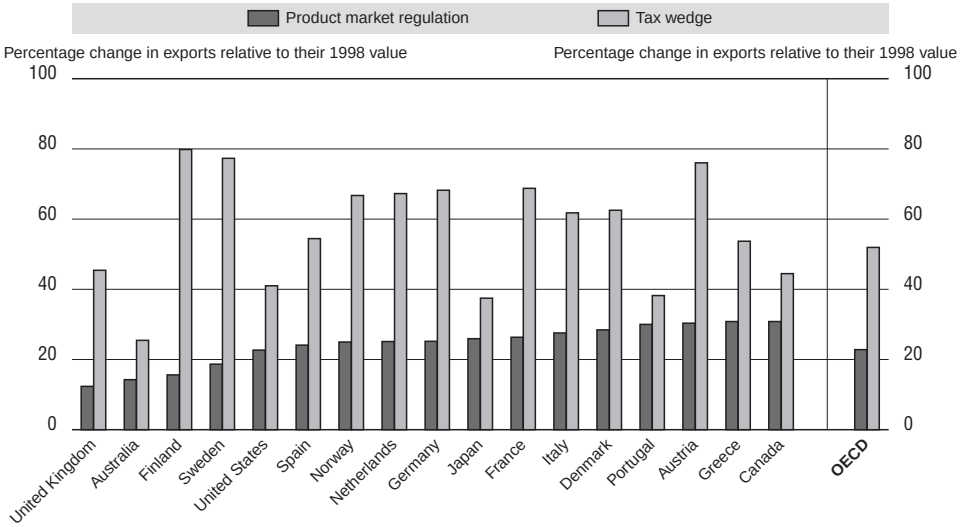
The increase in the level of total exports within the OECD area ranges from 6 to 20 per cent, depending on the policy package implemented. Unsurprisingly, the largest and most widespread gains are obtained by setting all bilateral tariffs to their minimum OECD level (close to zero), but significant large gains are also obtained when the import coverage of non-tariff barriers is reduced to the level found in the least restrictive country (Iceland according to the indicator presented above). Country-specific gains from these policies (relative to the level of exports in 1998) depend on the initial geographical distribution of a country's exports, but generally lie within a range of 10 to 15 per cent. The alignment of tariffs on those of the least restrictive partner would imply smaller gains (ranging from 4 to 10 per cent for most countries), partly because trade with high-tariff partners is usually weak. Simulated export gains from easing multilateral non-tariff barriers are more uniform across countries (around 7 to 8 per cent), partly reflecting the smaller cross-country differences due to the lack of the bilateral dimension in the available data.

Large OECD-wide gains are also obtained by aligning regulatory restrictions on those of the least regulated OECD country in 1998. The increase in exports implied by such policy for relatively restrictive countries – such as Greece, Portugal, Italy, France, Switzerland and Ireland – is about 30 per cent. Finally, curbing tax wedges to meet those of the lowest tax wedge country in 2000 (Australia) yields smaller, but still noticeable, OECD-wide gains. Indeed, in several European countries, where wedges are relatively high, this policy yields gains that are comparable to those obtained by reducing non-tariff barriers. Interestingly, the export losses implied by this policy scenario in a few countries (notably Australia and Ireland) reflect the relative loss in competitiveness of these countries' exports to countries that experience a large drop in the tax wedge as a result of the policy. On the whole, changes in policies have significant effects on goods exports in most countries, even though their absolute contribution to explaining deviations of exports from the OECD average is small (see above).

Figure 24 reports the results of a similar simulation for exports of services.[64] In this case, the gains implied by non-manufacturing product-market liberalisation and lower labour tax wedges are larger, reflecting the stronger estimated effect of policies on bilateral service exports. Tax and product-market reform could increase total services exports among OECD countries by 50 and 20 per cent, respectively.

© OECD 2003

Figure 24. **Change in services exports from easing product-market regulation and reducing the tax wedge on labour income**[1, 2]



1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
2. The simulation shows the effects of easing regulation in non-manufacturing industries to the level of the least restrictive country in 1998 (the United Kingdom) and aligning wedges to that of the lowest wedge country in 2000 (Australia).

Source: OECD.

EU *accession*, FDI *and trade*

Empirical results suggest that participation in free-trade agreements has had significant effects on both trade and FDI, especially within the European Union. Quantifying these effects is particularly important for OECD countries that will join the European Union in 2004, as established in the recent Athens EU Council Meeting. Table 6 suggests that the gains from EU accession for the Czech Republic, Hungary and Poland will indeed be sizeable in terms of trade integration and FDI stocks. This is due to both increased transactions with other EU countries and (to a lesser extent) increased trade and investment flows from non-EU countries. Trade flows are estimated to increase by around 10 per cent in both directions while FDI outstocks and instocks are estimated to double relative to average levels in

© OECD 2003

Table 6. **The effects of European Union accession on trade and FDI**[1, 2]

	Per cent increase in exports[3]	Per cent increase in imports[3]	Per cent increase in the FDI outstock[4]	Per cent increase in the FDI instock[4]
Czech Republic	11.5	10.9	103.0	112.0
	(47.2)	(49.7)	(0.4)	(24.2)
Hungary	11.2	10.4	28.1	107.0
	(45.0)	(47.8)	(1.6)	(19.3)
Poland	11.6	10.7	92.2	104.9
	(15.0)	(26.0)	(0.3)	(9.3)

1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
2. Initial levels relative to GDP are in parentheses.
3. Relative to 1998 values.
4. Relative to the average level over the 1990s.

Source: OECD.

the 1990s in most countries. However, these simulation results are likely to overestimate the actual post-accession gains to the extent that trade and FDI stocks have already been affected by the expectation of EU membership.

SUMMARY AND CONCLUSIONS

The results of the empirical analysis suggest that border openness to trade and investment and competition-oriented domestic policies have important implications for OECD trade and FDI patterns. The main conclusions in each of the broad policy areas examined in the paper are reviewed below under four headings.

Openness: formal trade and FDI restrictions:

- The empirical results suggest that eliminating remaining tariff and non-tariff barriers could increase significantly exports of goods within the OECD. The removal of border barriers in existing free-trade areas, such as the European Union (EU) Single Market or the North American Free-Trade Agreement (NAFTA), is estimated to have boosted both goods trade and overall FDI flows among participating countries. Likewise, simulations suggest that prospective EU membership may be associated with increasing trade flows and booming inward FDI positions for new EU members. By contrast, free-

© OECD 2003

trade areas do not seem to have increased significantly cross-border supply of services.

- A number of countries (especially outside the European Union) still have a relatively restrictive FDI environment in some important non-manufacturing industries, such as electricity, transport and telecoms. Aligning FDI restrictions on those of the most liberal country would increase significantly the OECD-wide inward FDI position.
- There is some limited evidence that stable exchange-rate arrangements may positively affect the inward FDI position of participating countries. Through this channel, countries that are members of currency unions (such as the European Monetary Union) experience further integration of their markets in both the union itself and globally. The complexity of the relationship between FDI and exchange-rate variability suggests, however, that this aggregate result may mask a variety of different responses of MNEs to the establishment of currency unions.

Product-market reforms:

- The countries with relatively restrictive and costly product-market regulations will tend to have lower stocks of foreign capital. Thus, product-market reforms that reduce the relative restrictiveness of regulations are likely to increase the level of inward FDI in a given country. OECD-wide product-market reform can raise the *overall* stocks of inward and outward FDI outstanding, thereby increasing global integration.
- Exports are negatively affected by both home and destination country anti-competitive regulations. Such home regulations may reduce both productive efficiency and the range and quality of goods supplied in foreign markets (*e.g.* through their negative effects on entry and innovation), thus regulatory reform in the home country is likely to positively affect exports. Restrictive regulations in the destination (importer) country also curb exports from the home country by making access to markets more difficult for foreign suppliers. All else equal, a general convergence of regulation in the OECD area towards the regulatory environment of the most liberal country would tend to increase within-OECD exports markedly.
- In services trade, the combined negative influence of restrictive regulations in the exporting and the importing countries is even stronger, because it affects for instance the ability of the exporting country to sell air transport, tourism or banking services to a trading partner. Unilateral or concerted efforts by OECD trading partners to implement significant competition and efficiency-enhancing reforms at both ends of the transactions are likely to boost the global volume of trade in services.

© OECD 2003

Labour-market reforms:

- Estimates suggest that strict employment protection legislation (EPL) and high tax wedges on labour income may sometimes affect the labour market in the home country in ways that curb its exports, for instance by making the reallocation of labour across firms, industries and occupations difficult. Similarly, by raising the cost of investment in the host country, they tend to lower its inward FDI. There are, however, important interactions between EPL and the institutional set up in the labour market as was pointed out by Calmfors and Driffill (1988) and Elmeskov *et al* (1998). When collective bargaining and other labour-market arrangements favour wage adjustments that fully offset the costs of EPL, the potentially negative effect on exports can be neutralised. In other regimes where such compensation is difficult, strict EPL is associated with significantly lower exports. By contrast, the collective bargaining regime can hardly moderate the negative influence of strict EPL on FDI. If EPL increases the risk/return ratio on foreign investment, foreign investors are likely to choose locations where this ratio is lowest, irrespective of the potentially offsetting effect of the collective bargaining regime. Empirical estimates suggest that labour-market reforms easing employment protection legislation and lowering tax wedges on labour income would boost global economic integration.

Infrastructure:

- Improving network infrastructure has ambiguous *a priori* effects on FDI, because inadequate infrastructure may motivate foreign investment in these industries. However, good infrastructure conditions are likely to be important for reducing transport and communication costs and increasing trade, especially in some services where international transactions require such conditions to be good in both origin and destination countries (*e.g.* freight, tourism, finance). Thus, policies that improve infrastructure can significantly increase both the bilateral and global volumes of service trade.

© OECD 2003

NOTES

1. The other important channel of globalisation is movement of people. For a discussion of migration trends, determinants and policies see OECD (2002a). Temporary movement of personnel is also an important mode of service supply that is not covered in this study.
2. The willingness of businesses to expand cross-border activity and their localisation decisions are likely to depend to some extent also on the taxation of profits of foreign subsidiaries. Patterns of FDI taxation and their effects on global integration are studied in two companion papers (Yoo, 2003; and Hajkova *et al.*, 2003).
3. This is in line with recent economic research (OECD, 2002a; Markusen and Maskus, 2001a, 2001b) that stresses the joint determination of trade and FDI flows. However, it is important to note at the outset that, due to the level of aggregation at which the analysis is performed, the long-standing issue concerning the substitutability or complementarity of trade and FDI is only dealt with tangentially in this document. This issue has been recently (and repeatedly) addressed elsewhere in the OECD by means of literature surveys (OECD 1995, 2002b) and empirical analyses using sectoral (OECD 1996, 1997a) and aggregate data (OECD 1998a).
4. Outward and inward positions are multilateral measures of FDI activity that cumulate for each investor country the bilateral stocks held in all FDI partner (host) countries (henceforth, outstocks) and for each host country the bilateral stocks held by all partner (investor) countries (henceforth, instocks).
5. FDI activity can in principle be decomposed into *i*) mergers and acquisitions, *ii*) greenfield investments, *iii*) reinvested earnings, and *iv*) capital transfers between related enterprises. In practice, available data rarely allow such decomposition to be made.
6. For instance OECD (2002c) considers the drop as a "correction" of the investment and stock market bubble that occurred at the turn of the century. High levels of FDI flows were also partly related to a flurry of unprecedented privatisation activity.
7. Geographical specialisation indicators for FDI inflows and outflows are broadly characterised by the same patterns. However, inflows indicators suggest that a "catch up" phenomenon is taking place in some countries, such as Greece *vis-à-vis* the European Union and Korea *vis-à-vis* Japan; and outflow indicators show that several countries (including a few EU members, Canada, the United States, New Zealand and Korea) had developed a specialisation in investing in Japan over the 1995-1998 period.
8. Data for the 1980-1990 period is incomplete or missing for transition countries and Korea.
9. For instance, services provided by a barber are hardly tradable between cities or regions within a country, not to mention across borders. However, the provision of

© OECD 2003

many other services, including some of the most dynamic ones over the past two decades (such as communication, financial intermediation and business services) involves lower transportation costs, which are further decreasing as information and communication technologies (ICT) spread out. Moreover, ICT are also decreasing transportation costs for services that were traditionally not tradable, such as retail distribution (see, for instance, OECD 2001b).

10. The effects of FDI taxation are studied in Hajkova *et al* (2003).

11. Policies can also affect trade and FDI indirectly, through their effect on factor proportions, for example by improving the quality of a country's infrastructure capital or the skills of its labour force.

12. Non-tariff barriers include so-called "core" measures, such as price controls (voluntary export restraints, variable charges, anti-dumping and countervailing actions) and quantitative restrictions (non-automatic licensing, export restraints, quotas and prohibitions). See OECD (1997b) for details.

13. M*ultilateral tariff and non-tariff barriers* are derived from detailed data on *ad valorem* MFN tariff rates and the frequency of non-tariff barriers in 6-digit industries of the Harmonised System of Classification (UNCTAD, 1998). The data are aggregated using average 1998 OECD import weights up to the 2-digit ISIC Rev. 3 level and average 1998 OECD value-added weights thereafter. Information about cross-country differentials in import shares for different goods (net of intra-EU imports) was exploited to differentiate trade barriers across EU countries. B*ilateral tariffs* are based on the new MacMaps data produced jointly by the Centre d'Etudes Prospectives et d'Informations Internationales and the International Trade Center (Bouet *et al.*, 2001, 2002). The MacMaps data report information on MFN duties, other *ad valorem* duties, specific duties, preferential margins, prohibitions, tariff quotas and anti-dumping (specific or *ad valorem*) duties. These are aggregated to the 2-digit ISIC Rev. 3 level using average import weights differentiated by group of trading partners. Despite the use of *average* import weights in aggregation, both the multilateral and the bilateral indicators may tend to underestimate the extent of trade barriers if import shares are depressed in industries with high barriers.

14. Moreover, by enlarging the size of the market accessed at equal trade cost by third-party countries, they could also tend to increase bilateral trade between the free-trade area and non-signatory countries, all the more so if non-signatory countries are themselves members of a different free-trade area (because the reverse phenomenon may apply). In particular, intra-industry trade may increase due to enhanced economies of scale.

15. See Markusen (2002) for an extensive discussion of the conflicting forces acting on bilateral FDI flows as trade liberalisation is implemented.

16. This could partly explain the wave of within EU mergers and acquisitions that followed the Single Market Programme.

17. Neary (2002) argues that this tendency takes the form of consolidation of different plants into a single location within the free-trade area. He also notes that the increased competition from MNEs of signatory countries can have an opposite influence on third-party investors, leading them to *reduce* investment in the free-trade area.

18. Non-statutory barriers to FDI are very difficult to ascertain and quantify. However, some of them were included in the indicators, such as the absolute barrier repre-

© OECD 2003

sented by full state ownership of business enterprises and hidden institutional or behavioural barriers documented in official reports.

19. To a large extent, the generalised decline in restrictions reflects full liberalisation of capital flows within the European Union (completed in the early 1990s) and the concomitant extensive privatisations both in the European Union and elsewhere (*e.g.* Mexico), which have opened up previously sheltered public firms and monopolies to foreign capital.
20. The indicators are unable to capture differences in the enforcement of restrictions, which might be particularly important for screening requirements. Also, several countries have further eased restrictions since the data were last collected.
21. A simple count of restrictions affecting different industries shows that 67 per cent of all restrictions concern the services sector (Sauvé and Steinfatt, 2003).
22. The simple bivariate correlation across countries between the sectoral indicators of FDI restrictions and the sectoral shares of employment in foreign affiliates is negative and significant.
23. Clearly the more these activities are centred in the host country, the less sensitive FDI is to changes in exchange-rate volatility. In Goldberg (1993) the effect of reduced volatility on FDI is ambiguous. On the other hand, Darby *et al.* (1999) stress the possibility of a negative impact.
24. Details on the regulatory indicators shown in the figures can be found in Nicoletti *et al.* (1999), Nicoletti *et al.* (2001) and Nicoletti and Scarpetta (2003).
25. While regulations that bar entry or raise costs may deter FDI, regulations that are aimed at protecting intellectual property rights (IPR) may increase the attractiveness of the host country for international investors, because protection of IPR makes it more difficult to imitate their firm-specific knowledge assets (*e.g.* through the movement of managers or employees from the foreign affiliate to local firms). See Smith (2001).
26. This idea and related empirical evidence are explored in detail in Mirza and Nicoletti (2003).
27. The summary indicator is the GDP-weighted average of the indicators of regulation in 12 non-manufacturing industries.
28. For instance, there is evidence that certain product market regulations can hinder firm growth and curb R&D spending (Nicoletti *et al.*, 2001; Bassanini and Ernst, 2002). Both factors can constitute a handicap for internationalisation.
29. Other important factors include, for instance, coverage of collective agreements, minimum wages and health and safety regulations, for which cross-country data are patchy or lacking.
30. EPL and the social expenditures that are financed through labour income taxation may also lower transaction costs in the relationship between workers and firms, reduce labour market frictions and smooth out the social costs associated with adverse labour market outcomes. Through these channels, EPL and labour income taxation can actually have positive repercussions for export prices and expected investment returns. However, these effects are difficult to measure and, in this study, the focus is on the role they play in pushing up production costs.
31. Moreover, in the same way as product market regulations, stringent EPL and high wedges in the home country may also encourage firms to localise production in countries where labour market rules and taxation are more favourable to business, thereby

© OECD 2003

stimulating outward FDI; but at the same time EPL may handicap firms that want to do so by hindering their potential for reorganising production or growing in size. Nicoletti *et al.* (2001) find that the average size of firms is negatively related to the stringency of EPL in a panel of OECD countries and industries.

32. This idea was first put forth by Calmfors and Driffill (1988). See Elmeskov *et al.* (1998) for evidence on the interaction between EPL and bargaining mechanisms and Daveri and Tabellini (2000) for the interaction between labour income taxation and bargaining mechanisms.

33. It is also possible that foreign investors may find the implications of restrictive EPL provisions more difficult to ascertain than domestic investors (due to an asymmetry of information) and hence have to face higher costs.

34. More importantly, government policies (*e.g.* access regulations) are crucial for ensuring a regulatory and business environment which is conducive to efficient private investment in infrastructure. See Gönenç *et al.* (2000) and OECD (2001b) for a detailed discussion of these issues.

35. Yeaple and Golub (2002) attempt to test these hypotheses and provide some support for the effects of infrastructure on comparative and absolute advantage.

36. Deardorff (1995) shows that this relationship emerges from virtually all models of trade.

37. The role of factor proportions in explaining trade flows is clearest in Hekscher-Ohlin models of trade. Moreover, in a general gravity framework relative endowments of human and physical capital also provide information on the supply of differentiated goods, which are usually skill and capital intensive (Evenett and Keller, 2002). Their role in determining vertical FDI is emphasised in Helpman (1984) and Helpman and Krugman (1985).

38. Markusen (2002) notes that FDI has only a *relative* advantage over trade with distant countries. Therefore, distance and transport costs may well have a negative influence on the intensity of outward FDI.

39. As mentioned above, the "financial" FDI data used in the analysis suffer from several drawbacks (*e.g.* they do not distinguish between mergers and acquisitions and greenfield investment, and may be geographically biased to the extent that MNEs use strategically-located holding companies to intermediate their investments), but the period and country coverage of the data on foreign affiliates was too limited for the purposes of empirical analysis. As regards services trade, the countries excluded are Belgium, Luxembourg, the Czech Republic, Iceland, Poland, Turkey, New Zealand, Mexico, Switzerland. Belgium and Luxembourg are excluded from partners. The Slovak Republic was also excluded from the analysis because data for other variables are missing.

40. For similar specifications see, for instance, Markusen and Maskus (1999) and Egger (2001). The reduced form approach implies that the estimated coefficients incorporate both direct and indirect effects of the explanatory variables. For example, the parameter of tariffs in the trade equations reflects both the direct effect on trade and the indirect effect operating through the effect of tariffs on FDI and the possible impact of the induced effect of FDI on trade.

41. The focus on FDI outstocks or instocks (instead of outflows or inflows) is justified by the fact that the decision of firms concerns the level of local production, which is a function of the desired level of the local stock of FDI.

© OECD 2003

42. The year-on-year difference of transportation costs was smoothed out to eliminate excessive volatility in the data.

43. In FDI equations, bilateral and effective exchange rates capture valuation and asset effects. In trade equations, nominal exchange rates together with the determinants of relative prices (*i.e.* relative factor endowments and policies that affect production costs) capture real competitiveness effects.

44. In addition a specific dummy for English-speaking countries was introduced to test for the possible influence of "language" effects, but no such effect was detected perhaps due to the presence of the bilateral fixed effect.

45. This transformation involves expressing the data as deviations from the values for the average home country or the average partner, which eliminates partner-specific or home country-specific effects, respectively.

46. Thus, in preliminary regressions, FDI instocks were related to both the average restrictiveness of policies in the host-country's FTA and their restrictiveness in the host country relative to other countries within the same FTA.

47. Due to data limitations, the total instock regressions covered only 10 to 19 OECD countries, depending on the policy variables included.

48. Distance could not be estimated in bilateral FDI equations because of its purely cross-section nature. Its effect is captured by the bilateral fixed effects which are accounted for non-parametrically. Transport costs were omitted from the bilateral service trade equations for two reasons. First, the measure used in this study is constructed as the difference in CIF-FOB in manufacturing trade, which may have little relevance for trade in services. Second, transport is one component of service trade, hence transport costs are likely to be endogenous to it.

49. Related to this, persistence could be also driven by the large share of reinvested earnings in FDI flows.

50. In the total instock regressions the relevant variable is the nominal effective exchange rate, which is a trade-weighted average of bilateral exchange rates. A depreciation of this rate does not necessarily imply a depreciation of all bilateral rates. Thus, the overall effect depends on the interaction of depreciation with the country mix of bilateral trade flows.

51. The estimated effect of restrictions is similar for FDI flows, with the reduction in flows implied by the restrictions varying between 9 and 70 per cent. The estimation results for FDI outflows are reported in Nicoletti *et al* (2003).

52. Available non-tariff measures are partner-specific variables that express MFN import protection against the average OECD exporter. Thus, they do not account for bilateral arrangements and other special regimes, including non-MFN treatment and anti-dumping measures. Bilateral tariffs do account for some of these factors, but are available only for the year 2001. It should be noticed, however, that results for bilateral tariffs are robust to the adjustment of standard errors for repeated observations over the time dimension.

53. The finding that FDI is boosted by EU membership is consistent with related evidence by Pain (1997) and Pain and Lansbury (1997). Positive effects of EU membership on FDI from third-party countries were also found by Dunning (1997) and Barrell and Pain (1998).

© OECD 2003

54. In the total instock equation regulation can be interpreted as being expressed relative to the OECD average.
55. Results for IPR are not robust to the adjustment of standard errors for repeated observations over the time dimension. The relationship between IPR protection and FDI is discussed in OECD (2002g).
56. In this case, however, statistical tests rejected the hypothesis that the effect is identical in both countries. Therefore, separate coefficients were estimated for wedges in the home country and the partner.
57. Transport would seem to be the main relevant infrastructure for trade in goods. It also plays an important role in trade in services, both directly through the freight and travel components of this trade and indirectly through the tourism component.
58. Excluding the low infrastructure countries yields insignificant (though correctly signed) estimates, probably due to the lack of sufficient cross-country variability in the data.
59. The restriction that the coefficients of (the log of) infrastructure in the country and partner are the same is supported by statistical tests.
60. In particular, this kind of simulations assumes that policy moves do not change the estimated average relationships (*i.e.* the estimated regression coefficients) between trade, FDI and policies and are thus subject to the Lucas critique (Lucas, 1976). Moreover, it is assumed that these average cross-country relationships are representative of relationships in each country.
61. Since differences in the level of trade and FDI across countries are captured by dummy variables, it is not surprising that policy variables appear to play a relatively small role in contributing to the overall variance in the data.
62. The unexplained residual is generally very small in the FDI equations.
63. In the simulations, the initial stock is defined as the inward FDI position in 1998.
64. Here regulation is specific to non-manufacturing and the most liberal country in 1998 is again estimated to be the United Kingdom.

© OECD 2003

BIBLIOGRAPHY

ANDERSON, T.W. and C. HSIAO (1981), "Estimation of dynamic models with error components", *Journal of the American Statistical Association*, Vol. 76.

ARELLANO, M. and S. BOND (1991), "Some tests of specification for panel data: Monte-Carlo evidence and an application to employment equations", *Review of Economic Studies*, Vol. 58, pp. 277-297.

BARRELL, R. and N. PAIN (1998), "Real exchange rates, agglomerations and irreversibilities: macroeconomic policy and FDI in EMU", *Oxford Review of Economic Policy*, 14/3, 152-167.

BARRELL, R. and N. PAIN (1999), "Domestic institutions, agglomerations and foreign direct investment in Europe", *European Economic Review*, 43, 925-934.

BASSANINI, A. and E. ERNST, (2002), "Labour market institutions, product market regulation, and innovation: cross-country evidence", OECD *Economics Department Working Papers*, No. 316.

BOND, S. (2002), "Dynamic panel data models: a guide to micro data methods and practice", CEMMAP *Working Paper* CWP09/02.

BOUET, A., L. FONTAGNE, M. MIMOUNI and F. VON KIRCHBACH (2002), "Market access map for GTAP: an assessment of bilateral protection in merchandise trade", presented to GTAP conference.

BOUET, A., L. FONTAGNE, M. MIMOUNI and X. PICHOT (2001), "Market access maps: a bilateral and disaggregated measure of market access", CEPII *documents de travail* No. 18.

BUCKLEY, P.J. and M. CASSON (1985), *The Economic Theory of the Multinational Enterprise*, London: Macmillan.

CALMFORS, L. and J. DRIFFILL (1988), "Bargaining structure, corporatism and macroeconomic performance", *Economic Policy*, Vol. 6, pp. 14-61.

CANNING, D. (2001), "The Contribution of Infrastructure to Aggregate Output", mimeo, World Bank.

CHATTERJEE, S. AND A. HADI (1988), *Sensitivity Analysis in Linear Regression*, New York: Wiley.

CHENG, L.K. and Y.K. KWAN (2000), "What are the determinants of the location of foreign direct investment? The Chinese experience", *Journal of International Economics*, Vol. 51, pp. 379-400.

CUSHMAN, D.O. (1985), "Real exchange rate risk, expectations, and the level of direct investment", *The Review of Economics and Statistics* Vol. 67, pp. 297-308.

DARBY, J., H. HALLETT, J. IRELAND and L. PISCITELLI (1999), "The impact of exchange rate uncertainty on the level of investment", *The Economic Journal* Vol. 109, pp. C55-C67.

DAVERI, F. and G. TABELLINI (2000), "Unemployment and Taxes: Do Taxes Affect the Rate of Unemployment?", *Economic Policy* Vol. 13, pp. 49-104.

© OECD 2003

DEARDORFF, A.V. (1995), "Determinants of bilateral trade: does gravity work in a neoclassical world", NBER *Working Paper*, No. 5377 (republished in: FRANKEL J. A. (1998), *The Regionalization of the World Economy*, University of Chicago Press, pp. 7-31).

DUNNING, J.H. (1981), *International Production and the Multinational Enterprise*, London, Allen and Unwin.

DUNNING, J.H. (1997), "The European internal market programme and inbound foreign direct investment", *Journal of Common Market Studies*, 35, pp. 1-30 and 189-224.

EGGER, P. (2000), "A Note on the proper Econometric Specification of the Gravity Equation", *Economic Letters*, No. 66.

EGGER, P. (2001), "European exports and outward foreign direct investment: a dynamic panel data approach", *Weltwirtschaftliches Archiv* 137(3), pp. 427-449.

ELMESKOV, J., J. MARTIN and S. SCARPETTA (1998), "Key Lessons for Labour Market Reforms: Evidence from OECD Countries' Experiences", *Swedish Economic Policy Review*, Vol. 5, pp. 205-252.

ERKEL-ROUSSE, H. and D. MIRZA (2002), "Import price elasticities: reconsidering the evidence", *Canadian Journal of Economics*, Vol. 35, No. 2, pp. 282-306.

EVENETT, S. and W. KELLER (2002), "On Theories Explaining the Success of the Gravity Equation", *Journal of Political Economy*, vol.110, No. 2, pp. 281-316

FINDLAY, R. (1996), "Government, trade and international capital mobility", in M. Lindahl and B.J. Ndulu (eds.), *New Directions in Development Economics*, Routledge.

GINARTE, J. and W. PARK (1997), "Determinants of patent rights: a cross-national study", *Research Policy*, Vol. 26.

GOLDBERG, L.S. (1993), "Exchange rate and investment in the United States industry", *The Review of Economics and Statistics* Vol. 75, No. 4, pp. 575-588.

GOLUB, S. (2003), "Measures of restrictions on inward foreign direct investment for OECD countries", OECD *Economics Department Working Papers*, No. 357.

GÖNENÇ, R., M. MAHER, and G. NICOLETTI (2000), The implementation and the effects of regulatory reform: past experience and current issues, OECD *Economics Department Working Paper*, No. 251, Paris.

HAJKOVA, D., G. NICOLETTI and K.-Y. YOO (2003), "The effect of corporate taxation on OECD patterns of FDI", OECD *Economics Department Working Papers*, (*forthcoming*).

HELPMAN, E. (1984), "A simple theory of trade with multinational corporations", *Journal of Political Economy* 92, pp. 451-71.

HELPMAN, E. and P. KRUGMAN (1985), *Market Structure and International Trade*, Cambridge, MIT Press.

HOEKMAN, B. and M. SCHIFF (2002), "Benefiting from regional integration", in Bernard Hoekman *et al.* (eds.), *Development, Trade and the* WTO: A *Handbook*.

JONES, R. (2000), *Globalization and the Theory of Input Trade*, Cambridge, MIT Press.

KOULON, M., M. GESTRIN and P. SAUVE (2002), "Trade, investment and the WTO: issues and options", *mimeo* OECD.

LUCAS, R.E., Jr. (1976), "Econometric policy evaluation: a critique", *The Phillips Curve and the Labor Market* (K. Brunner and A. Metzler, eds.), Vol. 1 of Carnegie-Rochester Conferences in Public Policy, a supplementary series to the *Journal of Monetary Economics*, Amsterdam: North-Holland.

© OECD 2003

MARKUSEN, J.R. (1984), "Multinationals, multi-plant economies, and the gains from trade", *Journal of International Economics*, Vol. 16, pp. 205-226.

MARKUSEN, J.R. (2002), *Multinational Firms and the Theory of International Trade*, Cambridge, MIT Press.

MARKUSEN, J.R. and K.E. MASKUS (1999), "Discriminating among alternative theories of the multinational enterprise", NBER *Working Paper*, No. 7164.

MARKUSEN, J.R. and K.E. MASKUS (2001a), "General-equilibrium approaches to the multinational firm: a review of theory and evidence", NBER *Working Paper*, No. 8334.

MARKUSEN, J.R. and K.E. MASKUS (2001b), "A unified approach to intra-industry trade and direct foreign investment", NBER *Working Paper*, No. 8335.

MATHA, T. (1999), "Proximity-concentration *versus* factor proportions explanation: the case of Swedish multinationals in the EU", presented to the conference I'ETSG.

MCKENZIE, M. (1999), "The impact of exchange rate volatility on international trade flows", *Journal of Economic Surveys* Vol. 13(1), pp. 71-106.

NEARY, J.P. (2002), "Foreign direct investment and the single market", CEPR *Discussion Paper* No. 3419.

NICOLETTI, G. and S. SCARPETTA (2003), "Regulation, productivity and growth", *Economic Policy*, 18:1 (36), April.

NICOLETTI, G., A. BASSANINI, E. ERNST, S. JEAN, P. SANTIAGO, and P. SWAIM (2001), "Product and labour markets interactions in OECD countries", OECD *Economics Department Working Papers*, No. 312.

NICOLETTI, G., S. GOLUB, D. HAJKOVA, D. MIRZA and K.Y. YOO (2003), "Policies and international integration: influences on trade and foreign direct investment", OECD *Economics Department Working Papers*, No. 359.

NICOLETTI, G., S. SCARPETTA and O. BOYLAUD (1999), "Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation", OECD *Economics Department Working Papers*, No. 226.

OECD (1995), "The links between foreign direct investment and trade", DSTI/EAS/IND/WP9(95)8.

OECD (1996), "The links between foreign direct investment and trade: empirical evidence for US and French industries (1984-1994)", DSTI/EAS/IND/WP9(96)5.

OECD (1997a), "How foreign direct investment affects international trade and competitiveness – an empirical assessment", DSTI/EAS/IND/SWP(97)15.

OECD (1997b), *Indicators of Tariff and Non-tariff Trade Barrier*, Paris.

OECD (1997c), OECD *Employment Outlook*, July, Paris.

OECD (1998a), "Trade competition and foreign direct investment: a new assessment", DSTI/EAS/IND/SWP(98)9.

OECD (1999), *Implementing the* OECD *Jobs Strategy: Assessing Performance and Policy*, Paris.

OECD (2000), OECD *Economic Outlook*, No. 68, Paris

OECD (2001a), OECD *Economic Outlook* No. 70, Paris.

OECD (2001b), OECD *Economic Studies* No. 32, Paris.

OECD (2001c), "Regional integration: observed trade and other economic effects", TD/TC/WP(2001)19/FINAL, Paris.

© OECD 2003

OECD (2001d), *Borderless Co-operation*: OECD *Global Forum on International Investment*, Paris.

OECD (2002a), "The economic impact of international migration: a framework for EDRC Country Reviews", ECO/CPE/WP1(2002)4, Paris.

OECD (2002b), *Foreign Direct Investment and Development*: *Where Do We Stand?*, Paris.

OECD (2002c), *International Investment Perspectives*, Paris.

OECD (2002d), OECD *Economic Outlook*, No. 71, Paris.

OECD (2002e), "The relationship between trade and foreign direct investment: A survey", TD/TC/WP(2002)14/FINAL, Paris.

OECD (2002f), "Regional trade agreements and the multilateral trading system", TD/TC(2002)8/FINAL, Paris.

OECD (2002g), "The impact of trade-related intellectual property rights on trade and foreign direct investment in developing countries", TD/TC/WP(2002)42/REV1, Paris.

OECD (2003), *Quantifying the Benefits of Liberalising Trade in Services*, (*forthcoming*) Paris.

OECD (various years), *International Investment Statistics Yearbook*, Paris.

OECD (various years), *International Trade by Commodity Statistics*, Paris.

OECD (various years), *International Trade In Services*, Paris.

PAIN, N. (1997), "Continental drift: European integration and the location of UK foreign direct investment", *The Manchester School*, LXV *Supplement*, 94-117.

PAIN, N. and M. LANSBURY (1997), "Regional economic integration and foreign direct investment: the case of German investment in Europe", *National Institute Economic Review*, No. 160, 87-99.

PANAGARIYA, A. (1999), "The regionalism debate: an overview", *The World Economy*.

ROSE, A.K. (2000), "One money, one market: estimating the effect of common currencies on trade", *Economic Policy* 30, pp. 9-45.

SAUVE, P. and K. STEINFATT (2003), "Assessing the scope for further investment regime liberalisation: an analysis based on revealed liberalisation preferences", OECD, in progress.

SMITH, P.J. (2001), "How do foreign patent rights affect US exports, affiliate sales, and licences?" *Journal of International Economics* Vol.55, pp. 411-439.

SOUBAYA CAMATCHY ARIGUELOU, I. (2002), *Commerce Intra-Firme et Investissements Directs*: *Aspects Théoriques et Application aux Multinationales Françaises*, Thèse de doctorat, Université de Paris I.

TAGLIONI, D. (2002), "Exchange rate volatility as a barrier to trade: new methodologies and recent evidence", *Economie internationale* 89-90.

UNCTAD (1998), *World Investment Report*: *Trends and Determinants*, United Nations, New York and Geneva.

UNCTAD (2001), *World Investment Report*: *Promoting Linkages*, United Nations, New York and Geneva.

WHITE, M. (1975), "Firm location in a zoned metropolitan area", in E. Mills and W.E. Oates (eds.), *Fiscal Zoning and Land Use Controls*, Lexington, MA., D.C. Heath.

WORLD BANK (2002), *Development, Trade and the* WTO: A *Handbook*, Washington DC.

WORLD BANK (2003), *Global Economic Prospects and the Developing Countries*, Washington DC.

© OECD 2003

YEAPLE, S.R. and S. GOLUB (2002), "International productivity differences, infrastructure, and comparative advantage", *mimeo*.

YOO, Kwang-Yeol (2003), "Corporate taxation of foreign direct investment income 1991-2001", OECD *Economics Department Working Papers*, No. 365.

© OECD 2003