

PRELIMINARY DRAFT

Will Factor Flows and Trade be Complements or Substitutes as Europe Enlarges?

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January 30, 2006

Warsaw

Abstract

With the gradual easing of labor flows within the European Union, a concern arises that receiving countries may be burdened, originating countries may see wages rise and competitiveness erode, and, with more equal costs of labor and capital, the basis for trade may be undermined. Thus, while the forces of factor price equalization bring substantial welfare gains, they also imply significant costs. But there is an alternative scenario in which factor and trade flows are determined by the process of productivity convergence in the context of expanding trade and investment networks. In this scenario, the lower productivity new member states, with a significant catch-up potential, continue to attract foreign capital, which, through its vertical production linkages, generates trade. In turn, the increased demand for labor in the new member states and the increasing per capita incomes also reduces the incentives for migration. The challenges in maintaining this virtuous convergence process are considerable, but so are the payoffs. The evidence suggests reasons for optimism.

* The authors are with the European Department at the International Monetary Fund, Washington D.C. This is a preliminary draft based on exploratory data analysis. Thanks are due to Andrew Rose for sharing his data and to Anna Unigovaskaya for excellent research assistance. The views expressed in this paper are those of the author and should not be attributed to the International Monetary Fund, its Executive Board, or its management.

1. Introduction

Following the addition of ten new members to the European Union (EU) on May 1, 2004, labor mobility within the enlarged EU is set to increase as restrictions are gradually phased out, creating new opportunities but also increasing policy challenges. Though the size of the resulting labor migration remains uncertain, it is expected to be large (highlighted especially in the presentation by Tito Boeri), carrying with it the promise of substantial net welfare gains from income convergence. Yet, concerns arise both in the labor receiving and in the originating countries. At the receiving end are the implications for the labor market and the costs of social assistance (discussed by George Borjas and Christian Dustmann). Less attention has paid been to the originating end, where the loss of labor can aggravate the pressures on public finances (through reduced pension contributions and higher costs in the delivery of public services) and increase the competitiveness challenge, especially in the context of intensifying low wage competition from outside the EU. Moreover, economic theory cautions that as labor moves from the poorer (more labor abundant) countries to the richer countries of the EU, and as countries, therefore, become more alike in their capital-labor ratios, the basis for trade may be undermined, compromising the dynamic benefits from international trade.

The policy dilemmas arising from increased labor movement can be mitigated if the migratory process is embedded in a larger positively self-reinforcing process of capital and trade flows. In an early perspective on the potential and costs of “East-West” migration, when many of the new members were still dealing with the legacies of the economic system under communism and were in the throes of transition to market economies, Layard et al. (1992, p. 51) perceptively outlined an important scenario:

“Given the difficulties posed by the prospect of very large scale migration from East to West, and the risk that such large-scale migration could actually leave the remaining population in the East worse off, we need to ask what alternatives are available. Ideally, policy should try to bring good jobs to the East rather than workers to the West. International trade and investment *can* act as substitutes for migration. A free trade pact that ensures Eastern European countries access to the Western European market is the best single migration policy that could be put in place.”

A similar possibility was visualized by former Mexican President Carlos Salinas de Gortari in the context of the North American Free Trade Agreement (NAFTA). “Mexico wants to export goods, not people,” he said.¹ In the event, for the Central and East European nations, the membership of the EU has provided the ultimate free trade pact. The question, therefore, is whether this vision is a plausible one.

Economic theory is ambiguous on the relationship between labor, capital, and trade movements (Venables 1999, Collins, O’Rourke, and Williamson 1999, Razin and Sadka 2001, and Faini 2004). In the simplest, but potent, characterization, trade reflects differences in factor endowments. A country with a higher labor-capital ratio exports goods with a higher labor content and, thus, indirectly, exports labor that is embodied in the exported goods. Through this process, the price of labor is equalized across countries, eliminating the motive for migration. The same applies for capital flows. Trade and factor flows are, in this view, substitutes. More trade is predicted to be associated with smaller factor flows; where factor flows are freely permitted, relative factor endowments will equalize, leaving no basis for trade. While important in guiding policy and in interpreting empirical evidence, this characterization is necessarily incomplete, not least because despite substantial trade liberalization, factor prices differences across countries are starkly large. Razin and Sadka (2001) conclude that factor price differences may persist

¹ See Aroca and Mahoney (2004, p. 449).

when more goods are traded than underlying factor inputs and countries differ in the productive use of inputs (either because of access to superior technology or because of economies of scale).

In assessing the new member states' prospects of factor flows and trade, two features of their economic structure and achievements appear relevant: low capital-labor ratios and low productivity. Much of the discussion of factor flows focuses on the significantly lower capital-labor ratios relative to more advanced countries (Table 1).² Because factor prices are not equalized merely by trade, relatively low wages encourage emigration and capital is, in principle, attracted to take advantage of the potentially high returns. Factor price equalization is, therefore, directly influenced by the factor movements themselves. But, despite a regime of virtually free capital movements, capital flows have been restrained. Lipschitz, Lane, and Mourmouras (2002) conclude that substantially greater volumes of capital should flow into the new member states than is actually the case. The reason why capital flows remain constrained relates in substantial measure to the second feature of these economies: their relatively low productivity (Table 1). As Layard et al. (1992, pp. 56-57) point out, productivity differences are crucial. Indeed, where productivity is sufficiently low, capital will flow from the poorer to the richer country.

In this paper we argue that the role of trade and factor flows in Europe will be intimately connected to the more fundamental underlying process of productivity convergence. A positive dynamic is, indeed, possible. Capital inflows attracted by the potentially high returns can increase productivity, generate trade by linking the new

² It is the case that their capital-labor ratios are higher than in poorer countries from which inward flows of labor are on the increase. However, that is not a line of enquiry we pursue here.

member states into European production networks (further increasing productivity from possible knowledge flows through these networks), and increase the domestic demand for labor. With higher immediate demand for their services and prospects of substantial productivity-led wage increases, the incentives for emigration also decline. In turn, a more productive labor force increases the return to new investments. While some emigration will undoubtedly occur, it could help to deepen the economic linkages that make possible additional capital inflows and trade. The basis for such a positively self-reinforcing mechanism exists. Trade and investment linkages are well-established: the evidence suggests that the new member states have high trade and investment ratios relatively to most emerging markets. Building on these linkages could accelerate the process of productivity convergence while mitigating the policy anxieties on account of the anticipated migratory flows. However, considerable risks exist in this scenario and the process can also unravel and operate in the opposing direction. Low productivity growth, low capital inflows, reduced trade flows, and increased emigration could also reinforce each other.

This paper is an effort to add to the empirical evidence on these matters. As Collins, O'Rourke, and Williamson (1999) note, the ambiguities in economic theory and the range of possible outcomes invite an empirical exploration. Yet, the challenges in conducting such an exploration are considerable. Not the least of the problems has been the lack of availability of data on international migratory flows (Aroca and Maloney 2004, therefore, rely on internal migration to draw inferences on international links between factor and trade movements). A number of econometric problems also bedevil the analysis, especially the difficulty in identifying the direction of causation between the

flows. Nevertheless, relying on bilateral migration data that is increasingly becoming available, we examine, in a “gravity” framework, the determinants of trade, migration, and investment flows. Such a framework, which has proved valuable in explaining trade and capital flows, relates the bilateral flow to the size, per capita incomes, and measures of distance between the two countries. In particular, we examine if these flows reinforce each other—and, to the extent our efforts at identifying the direction of causation have proved insufficient, the results should be treated as indicative of correlations in these flows. The results are consistent with the possibility of a positive dynamic of complementary flows but also point to the risk of a reversal of this dynamic arising from the pressures for substitution.

2. Trade and Factor Flow Integration: Are the New Member States Different?

Before estimating any equations, we ask two questions of the data. First, are the new member states different from other emerging markets in their trade and international factor flow relationships relative to other emerging markets and advanced economies? Second, what is the aggregate evidence on the relationship between capital and labor flows: are inflows of capital accompanied by outflows of labor, mainly in response to factor equalization pressures or does a larger inflow of capital increase the demand for labor, reducing labor outflows?

Figure 1 (a) through (c) reports on trade, migration, and FDI ratios. Two groups of new member states are highlighted: the Baltics (Estonia, Latvia, and Lithuania) and the Central European Five (CEC-5, Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia). These are compared with the industrialized OECD economies and with Asian

and Latin American emerging markets. The data appendix lists the countries in each group. The period covered is 1997-2001, the ability to go beyond 2001 is limited by the migration data, which is incompletely available for recent years.

On average, the trade ratios are high for the Baltics and the CEC-5 relative to the industrialized economies and the two emerging market groups (Figure 1(a)). Of course, these averages mask considerable within-group differences. Thus, the Asian average is weighed down by such countries as India and Pakistan. But even when considered against the more open East Asian economies, the Baltics and CEC-5 are at least on par in terms of their average trade ratios.³ The gap vis-à-vis Latin America is particularly large, though these comparisons do not take into account differences in country size, with the smaller average country size in the Baltics and the CEC-5 favoring higher trade ratios.

Migration ratios are small everywhere, less than 0.15 percent of population a year (Figure 1(b)). But once again, the new member states stand out, especially vis-à-vis their emerging market peers. The same holds for foreign direct investment (FDI, Figure 1(c)). Some part of the high FDI flows-GDP ratios in the new member states during the period 1997-2001 reflected the rapid privatization of previously state-owned assets and the ratios have fallen since then. Nevertheless, the large accumulated stock of FDI implies that these economies stand out in terms of the international links they have established through FDI. Note, in the case of FDI, the Latin American average is considerably higher than that for Asia (where the intra-regional differences are once again considerable).

Thus, in their transition to market economies, given their relatively small sizes and their proximity to Western Europe as well as to the former Soviet-bloc economies,

³ The significantly higher trade ratios are for Hong Kong and Singapore, which are not included in this study.

these new member states have established strong international ties in all three dimensions. In this regard, they are different from their emerging market peers in as much as countries in the other regional groups typically have intense international contact in one or the other dimension. The new member states are closer in the maturity of their international ties to the more advanced industrialized OECD economies.

Next, when we examine the cross-country correlation between trade, emigration, and FDI, the only clear pattern is an apparently strong correlation between trade and FDI (Figure 2). The data suggest that countries that attract a larger amount of FDI also trade more than other countries. A particular example in this regard is Ireland, with high FDI inflows and trade ratios. Ireland also does not have much outmigration, as if this high level of trade and activity keeps people gainfully employed at home; if anything, Ireland has drawn in considerable labor recently from the Baltic nations, among others. But, in general, no simple relationship between FDI (or trade) and migration stands out.

There is greater evidence for complementarity in the FDI-migration relationship in the time-series relationships. For countries that originate labor outflows, there is some mild tendency for a reduction in outflows to be associated with more FDI. If robust, the implication would be that where labor outflows are constrained, capital inflows serve the function of equalizing factor prices; alternatively, if strong capital inflows occur, the incentives to migrate are dampened. Stronger evidence is seen in the data for the US and Germany: here, it appears as if the inflow of more migrants reduces the outflow of FDI. Thus, if economic prospects in these advanced countries improve, a larger foreign labor force is attracted and more capital stays home to exploit the opportunities.

Prima facie, then, FDI stands at an important nexus. It is associated with more

trade. And while the cross-sectional relationship with migration is ambiguous, implying that both substitution and complementarity may be at work, the time-series relationship leans in favor of a complementary relationship between capital and labor. We put these ideas to a more rigorous test in the following sections.

3. The Empirical Framework and Data

The empirical framework draws on a standard gravity model, applied widely to model bilateral trade flows and more recently to capital flows.⁴ For comparison, we estimate identical models for trade, migration, and FDI flows. For our purpose, the relationship of interest is between advanced economies and developing economies. Advanced economies are the source of FDI flows to the developing nations and are the destination of migrants from these developing countries. Thus, our equations are set up to enquire into the determinants of capital flows from advanced to developing countries and of labor from developing to advanced countries. The trade flows, in contrast, are measured as the sum of exports and imports; as such, in this case, no distinction is made in the direction of flows. Within the general context of advanced and developing nation interactions, we also identify the links between the EU-15 and the new member states. The data consists of 16 advanced economies and 28 developing economies for 448 potential pairs of relationships, over the 6-year period from 1995 to 2001. When the advanced nation sample is restricted to the “EU-15” (in practice data was available for 11 countries), the number of potential pairs is reduced to 308.

In our basic set up, bilateral flows are a function of: (a) advanced country per

⁴ See e.g. Reuven and Rose (2002), and Loungani, Mody and Razin (2002) for recent applications of gravity models to trade and capital flows.

capita income; (b) developing country per capita income; (c) advanced country population; (d) developing country population; (e) the distance between the two countries; (f) a dummy that takes the value 1 if the two countries share a common language, and zero otherwise; (g) a dummy that takes the value 1 if the two countries share a border, and zero otherwise; and, finally, (h) a dummy that takes the value one if the two countries had a colonial relationship in the past, and a zero otherwise. In addition, we add dummy variables for the CEC-5 and the Baltics to see if, after conditioning for these factors explaining international flows, they stand out in the intensity of their international links, as the unconditional relationships reported above suggested.

Next, to each equation we add the other international flows to assess the relationship between these flows. The variables representing the flows on the right-hand side are of two types: (a) the bilateral flows, of FDI and trade in the equation explaining migration, for example; and (b) the aggregate flows of FDI and trade associated with the developing country. Thus, the equations ask if more FDI from a particular advanced economy is associated with more labor flows to that same advanced country and also whether more FDI from *all* advanced economies increases the general level of emigration.

Briefly, there are three econometric challenges to estimating these equations. First, many bilateral flows are zero. Several approaches have recently been advanced to deal with the non-linearity that zero values introduce. In this exploratory analysis, we use a tobit with a cut-off value at zero. Second, while we control for some unchanging relationships, such as distance, common language, common border, and colonial past, there are potentially other variables that are relevant to these international flows and

omitting them could bias the results. For this reason, we allow for bilateral country-specific effects, estimated in a random-effects model. Thus, the unit of analysis is the bilateral relationship. As is well-known, a random-effects model estimates the coefficients using both time-series (within-country pair) and cross-sectional (across country-pairs) information. Throughout time dummies are used to control for common shocks. The third, and most challenging, task is to determine the direction of causation from one flow of interest to the other. We use as an instrument the aggregate flows in the advanced economy. Thus, the assumption is that bilateral FDI flows from advanced country "j" are influenced by the aggregate flows from that country in that year; however, the bilateral dependent variable (migration or trade) does not influence advanced country's aggregate FDI flows. The results presented should be treated as work in progress.

4. The Results

The results are presented in two steps. Tables 2 and 3 are used to establish the credibility of the gravity framework in this present context. In doing so, we also draw some useful inferences regarding the nature of the flows, including the possible complementary nature of FDI and labor flows through the finding that a rise in per capita income of a developing country increases FDI inflows but either decreases (or does not significantly influence) labor outflows and the possible complementarity between trade and FDI, through the negative coefficient on distance in the FDI equation, suggesting that the FDI is of a vertical nature, intended for producing and trading intermediate goods. In the second step (Tables 4 and 5), we examine the more direct relationships between trade,

migration, and FDI.

Inferences from the Gravity Variables

First, as advanced countries become richer (raise their per capita incomes), they trade more, export more capital in the form of FDI and, in general, receive more migrants (Table 2). These effects are stronger when the advanced country sample is restricted to the EU-15 (Table 3).

Second, among developing economies, a larger per capita income increases both trade and FDI, but either has no effect on or reduces labor outflows. If a higher per capita income is a proxy for such country features as superior skills, better institutions, and more efficient financial intermediation, the results suggest that developing countries with higher per capita incomes attract more FDI on account of their superior investment climate defined in this broad manner. At the same time, these same features serve to retain the labor force at home. This complementary relationship between FDI and labor, as per capita incomes increase, is especially evident when the advanced country sample is restricted to the EU-15. The relationship is complementary not in a technical sense but rather a reflection of a set of country conditions that influence both the demand for capital and labor.

Third, larger country size (proxied by the country's population) results in larger flows.

Fourth, distance between countries reduces flows, as is traditional in gravity models. Interestingly, trade is least sensitive to distance. In the EU-15 specification (Table 3), FDI is more sensitive to distance and labor flows are the most sensitive. The sensitivity of FDI to distance has been something of a puzzle. In Loungani, Mody, and

Razin (2002), this result was explained by proposing that FDI from advanced to developing countries is mainly of a vertical nature (i.e., the FDI is used to facilitate production of intermediate goods in a production network. As such, FDI and trade are complementary to each other. That FDI is more sensitive to distance than is trade itself could reflect the possibility that these complex FDI-based production networks are best conducted in relatively close proximity, favoring developing countries located close to more advanced nations originating such FDI.

Fifth, the CEC-5 and the Baltics do stand out, but especially in trade and investment relationships and especially in the EU-15 sample. In the full sample (Table 2) of advanced economies, in fact, the CEC-5 dummy is negative, implying that after controlling for the traditional gravity factors, these economies trade less, receive somewhat lower investment, and send out fewer migrants. The positive Baltic dummy, in contrast, shows a tendency to global integration over and above that predicted by the gravity variables. When the estimation is restricted to the EU-15 sample, however, the dummies for the CEC-5 and the Baltics for the trade and investment equations are both positive and highly significant. The implication is that the new member states have deep trade and investment relationships with the advanced European nations even after controlling for the physical proximity. When the proximity variables are dropped, the advantage of the new member states is particularly evident. Thus, the unconditional relationships in Figure 1, which showed that the new member states are more integrated into the global trade and factor flows than other emerging market peers reflects broadly their physical and cultural proximity and ties to the advanced European nations. This creates opportunities for engaging in trade and production networks that can help

accelerate the convergence process.

The trade, migration, and FDI nexus

Table 4 reports on the results without instrumenting the right-hand side bilateral flows and Table 5 repeats those regressions after instrumenting, as described above.

Throughout, we restrict the sample to the “EU-15.”

The strongest evidence of reinforcing bilateral flows is between trade and FDI (columns 1 and 6 of Tables 4 and 5). Whether instrumented or not, more bilateral trade is associated with more bilateral FDI and more FDI is associated with more bilateral trade. Aggregate FDI does not appear to have an influence on increasing trade with all countries, though (mainly after instrumenting) it appears as if larger aggregate trade flows are associated with lower FDI flows. Thus, the evidence is consistent with bilateral trade and investment linkages that serve the function of economizing on information costs necessary for transacting in time-sensitive and/or technology intensive production processes.

In columns 2 and 4, the finding is that aggregate migration reduces trade and aggregate trade reduces migration. The first finding is consistent with a factor endowments view of trade: where direct migration becomes possible, labor movement need not necessarily be embodied in trade. Note, however, that because we have measured trade as the sum of exports plus imports, this conclusion would be true if (as is generally the case) that exports and imports are correlated. Similarly, the reduction of migration due to an increase in aggregate trade also suggests that trade and labor flows are substitutes. The latter finding is a confirmation of the Layard et al. (1992) belief that if trade is increased, the pressures for migration will be alleviated. Even more strongly,

the findings here suggest that FDI inflows increase trade, which reduces the pressures and incentives to migrate. This, then, is presumably the best of all situations: more capital, more trade, and lower outmigration. Of course, the more dire consequence would occur if this set of relationships were to work in reverse, i.e., a fall in FDI, leading to a reduction in trade, also increases emigration.

The direct relationship from FDI to migration also suggests that more FDI appears to reduce migratory outflows. In Table 4, column 3, this is seen in the negative relationship between aggregate FDI inflows and emigration; in Table 5, column 3, the bilateral relationship is negative and significant, as if a country that increases its exports of capital to a country also reduces its intake of migrants from that country. However, there is some evidence that more migration from a country is associated with more FDI into the country. This could reflect a factor price equalization process or a networking effect as FDI becomes less costly *ex ante* because workers become better known in the host country; this effect is, however, weakened after the instrumenting for migration.

5. Conclusions

The most consistent finding of this paper is the self-reinforcing relationship between FDI and trade. This is seen in the simple, unconditional relationships, in more subtle (and possibly speculative) interpretation of the negative coefficient on distance in the FDI equation, and in the direct (conditional) correlations between trade and FDI (i.e., the relationship survives even after controlling for the gravity variables and the, possibly crude, efforts at attempting to isolate the exogenous components of trade and FDI flows when using them as explanatory variables). This relationship is thus the fulcrum of the

nexus between trade and factor flows. If this relationship continues to hold, then increased FDI not only contributes to the overall income convergence process directly through importing new technologies into the recipient country but fosters trade that also has potential spillover productivity effects and creates the jobs necessary for stemming migratory pressures. All told, this virtuous process can lead to higher per capita incomes while reducing the pressures on the social assistance systems in countries receiving migrants while also limiting domestic dislocation and reducing the strains on domestic public finances. Of course, the relationship has something of the nature of needing to run faster to stay in the same place. As the global competition for foreign investment increases, nations need to provide them the necessary public goods to remain attractive destinations. Effective use of EU funds to provide the necessary public goods becomes crucial in this context. Or else, a race to the bottom tax competition could ultimately erode public finances and with it the positive dynamic described here.

Data Appendix

Variable	Data Source
Migration	International Migration Data OECD, and Global Data Center of Migration Information Source
FDI	International Direct Investment Database, OECD
Trade	Direction of Trade Statistics Database, IMF
Per capita income	Calculated using data from the World Economic Outlook Database, IMF
Population	World Economic Outlook Database, IMF
GDP	World Economic Outlook Database, IMF
Distance	Andrew Rose's Website: http://faculty.haas.berkeley.edu/arose/
Language	Andrew Rose's Website: http://faculty.haas.berkeley.edu/arose/
Border	Andrew Rose's Website: http://faculty.haas.berkeley.edu/arose/
Colony	Andrew Rose's Website: http://faculty.haas.berkeley.edu/arose/
Total Emigration from Developing countries	Calculated using the bilateral data
Total Immigration in to Developed Countries	International Migration Data OECD
Total FDI inflows in to Developing countries	Balance of Payments Database, IMF
Total FDI outflows from advanced countries	Balance of Payments Database, IMF
Total Trade	Direction of Trade Statistics Database, IMF

Advanced (developed) countries included in the restricted "EU-15" regressions (Table 3 through 5) are: Austria, Germany, Denmark, Finland, France, England, Greece, Italy, Netherlands, Portugal and Sweden. The larger sample in Table 2 also includes Australia, Canada, Japan, Norway, and USA.

Developing countries included in the regressions are: Argentina, Bulgaria, Belarus, Brazil, Chile, China, Colombia, Costa Rica, Czech Republic, Estonia, Georgia, Hungary, India, Indonesia, Korea, Lithuania, Latvia, Mexico, the Philippines, Poland, Russia, Slovakia, Slovenia, Thailand, Turkey, Ukraine, Uzbekistan, and Venezuela.

The time period covered is 1995-2001.

The sample from Table3 onwards is:

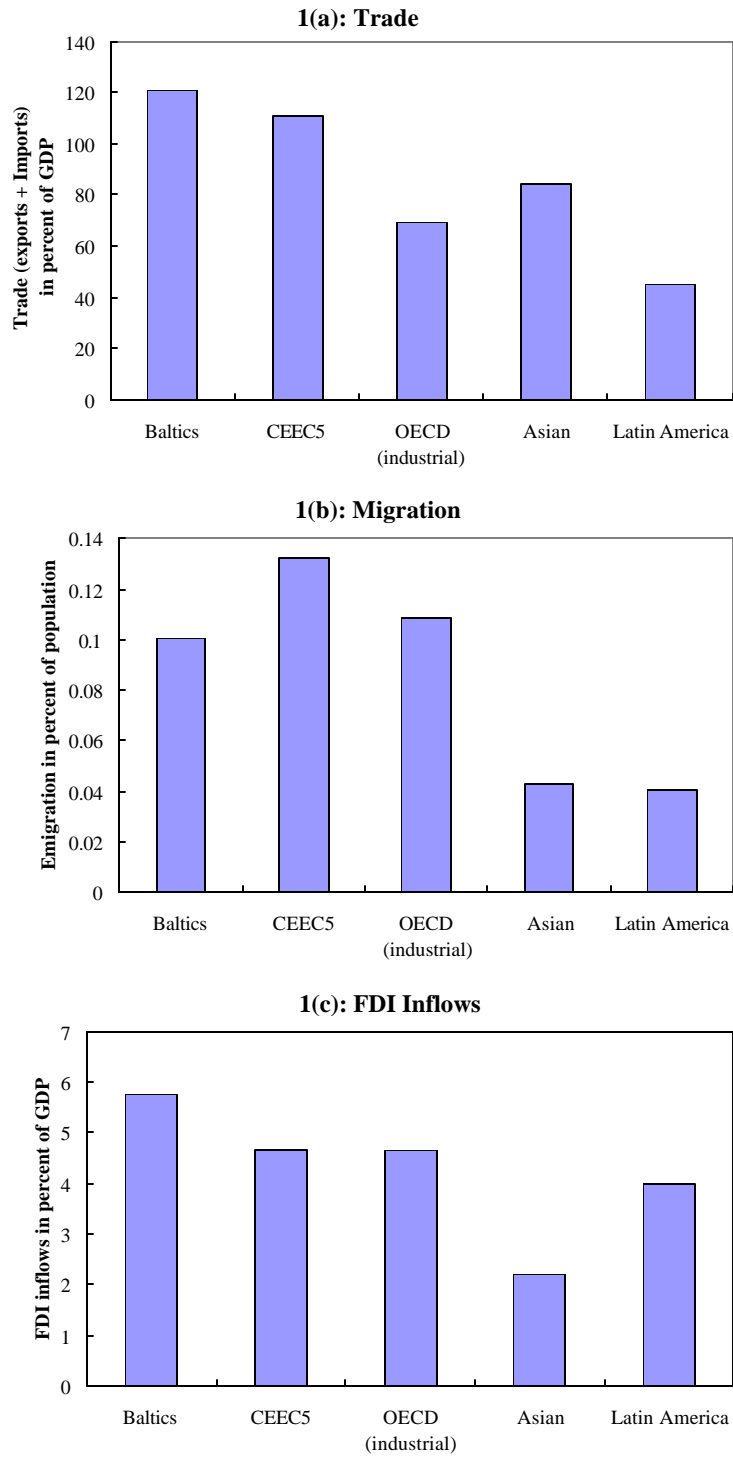
	Zeros values	Positive values
Migration	340	1193
FDI	638	895
Trade*	68	1465

* For trade there were no zero values. As in Reuven and Rose (2002), the bottom five percent values were converted to zeros.

References

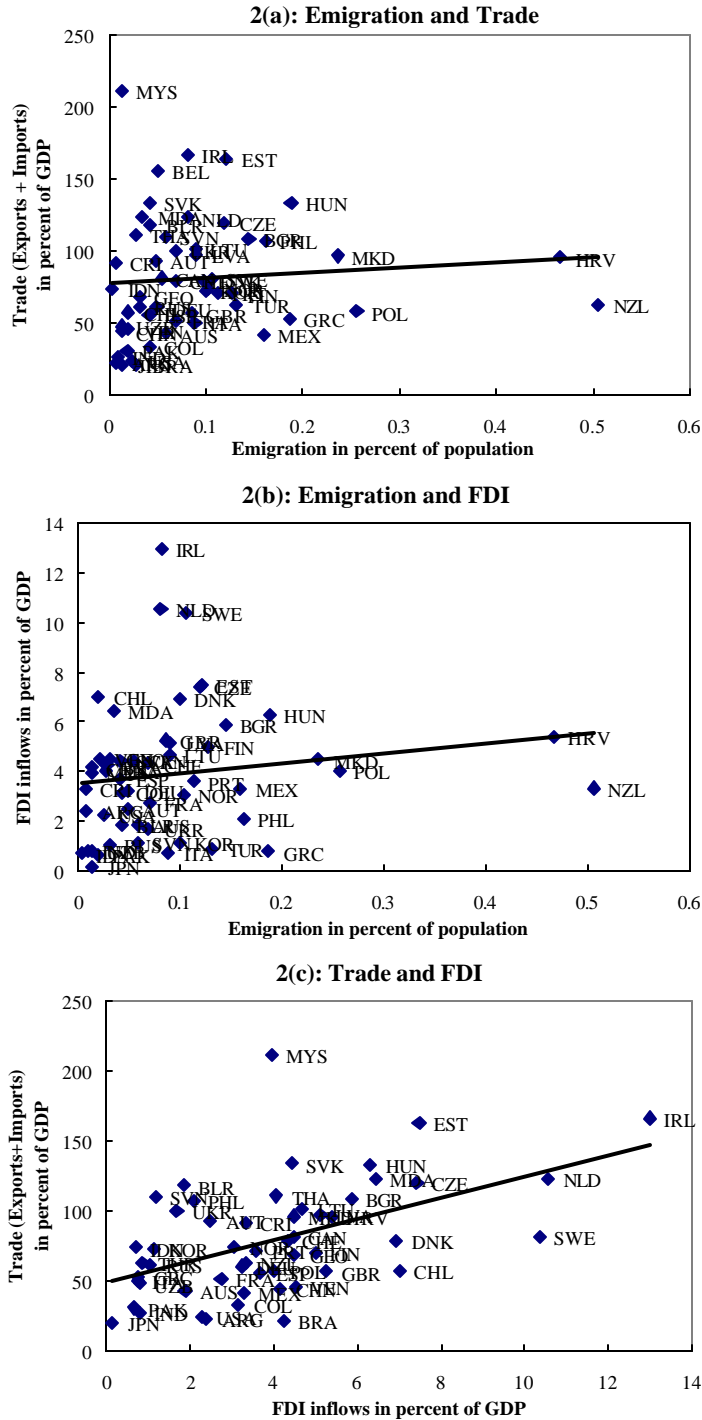
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Figure 1. Trade and Factor Flow Intensities, 1997-2001
(Annual averages)



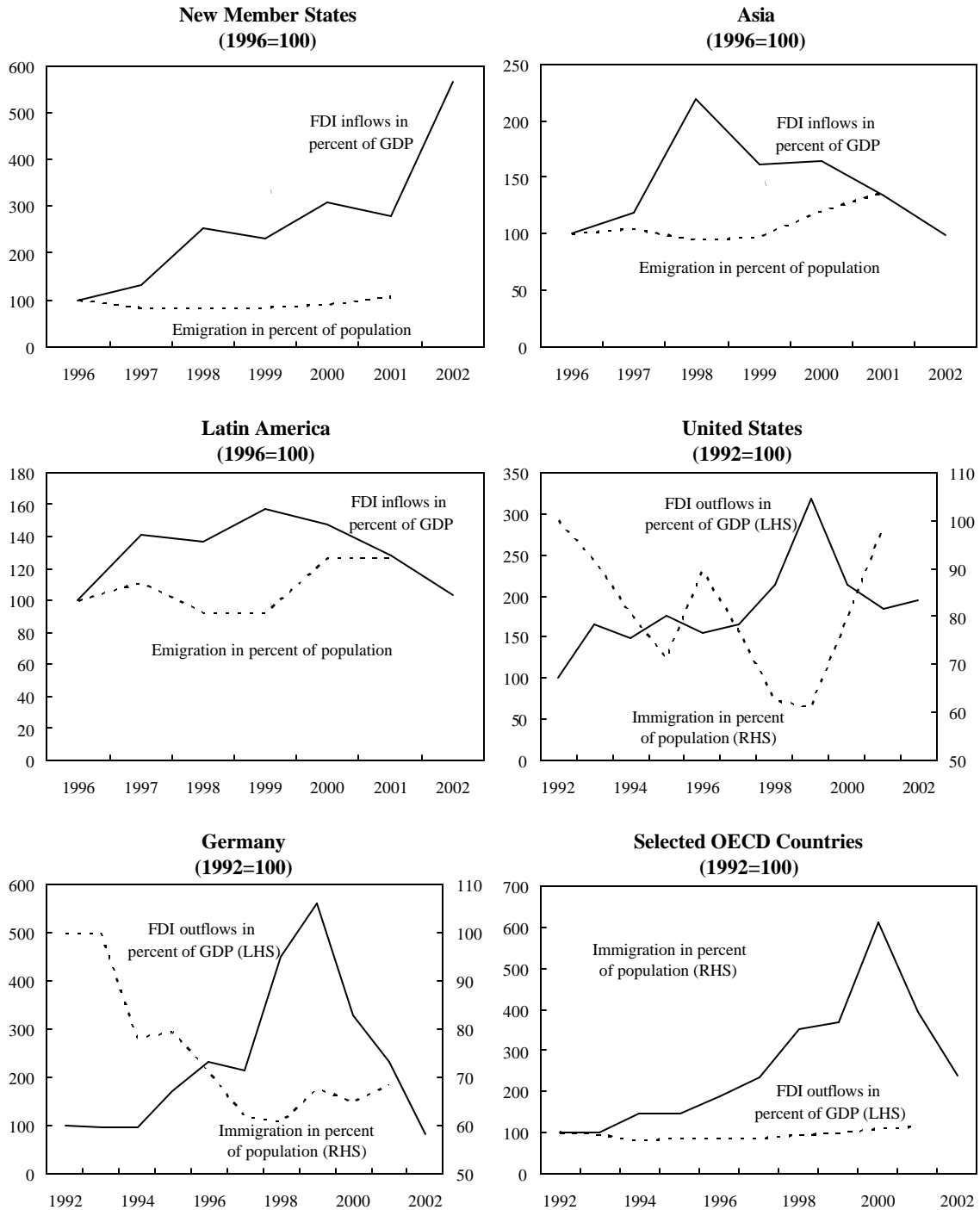
Sources: International Migration Data OECD; Global Data Center of Migration Information Source; Balance of Payments, IMF; Direction of Trade Statistics, IMF

Figure 2. Correlation between Trade, Emigration, and FDI Inflows, 1997-2001
(Annual averages)



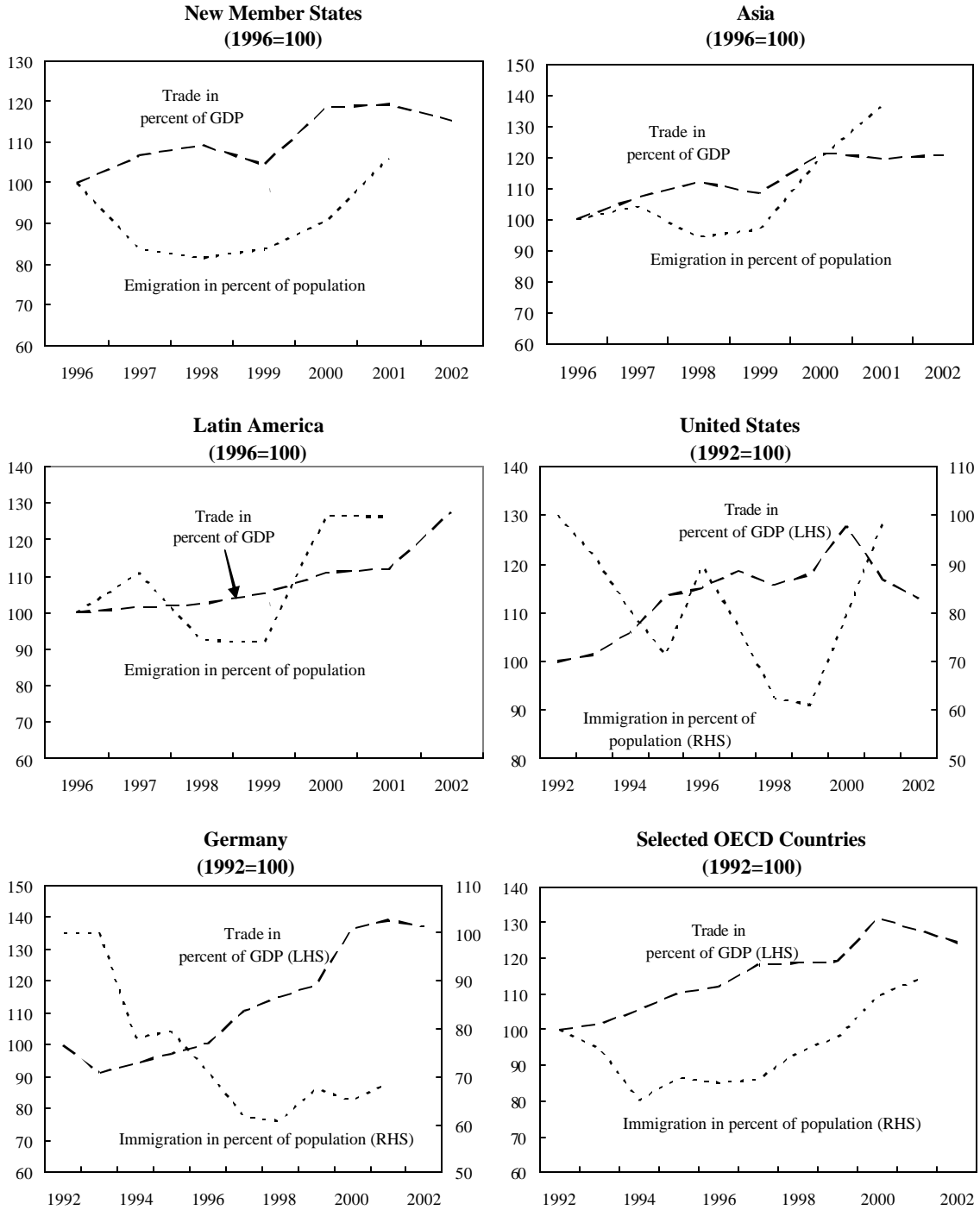
Sources: Authors' calculations using data from International Migration Data OECD, Global Data Center of Migration Information Source, Balance of Payments Database, IMF, Direction of Trade Statistics Database, IMF

Figure 3(a). Time Series Patterns in Migration and FDI Flows



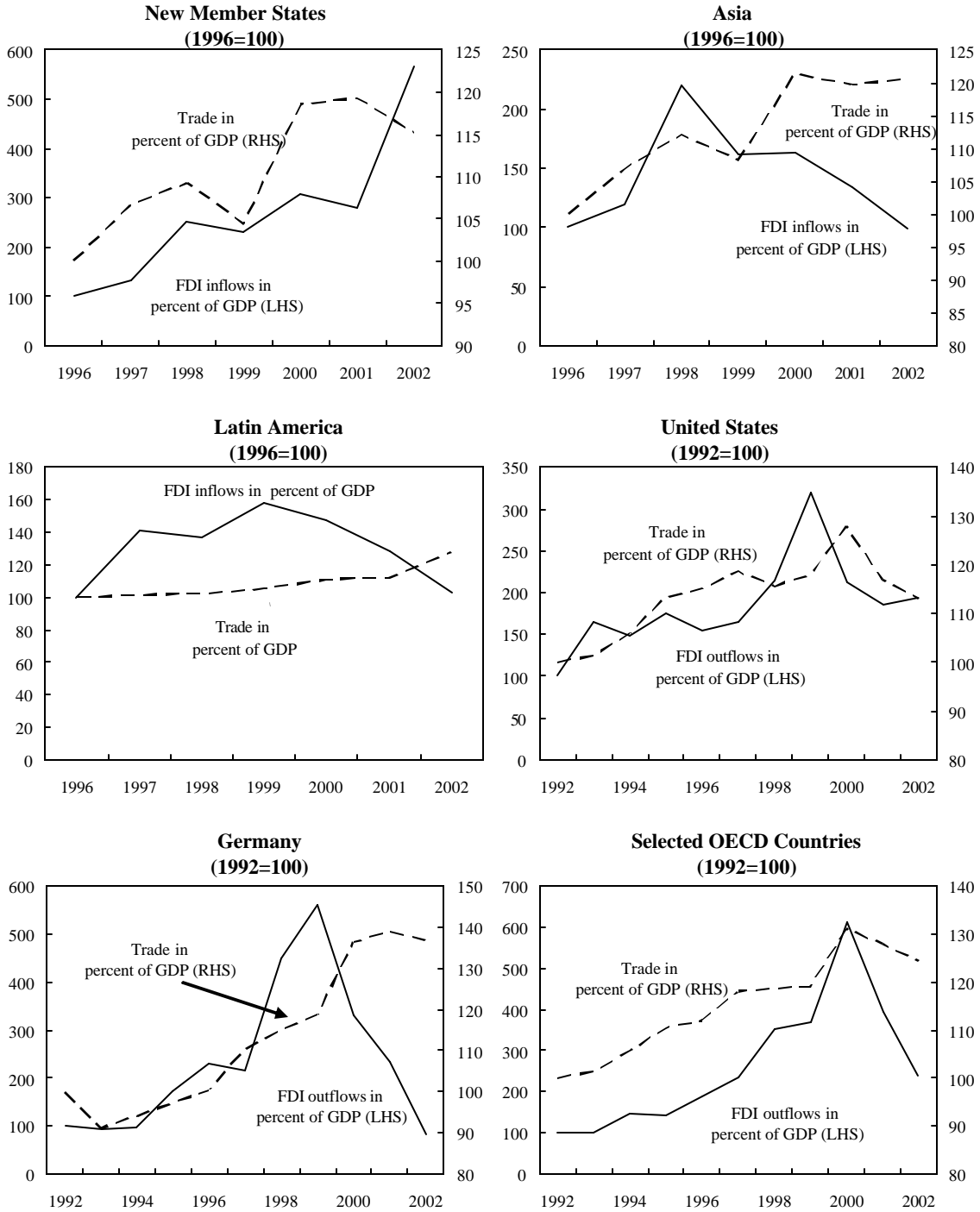
Sources: Authors' calculations using data from International Migration Data OECD, Global Data Center of Migration Information Source, Balance of Payments Database, IMF, Direction of Trade Statistics Database, IMF

Figure 3(b). Time Series Patterns in Migration and Trade Flows



Sources: Authors' calculations using data from International Migration Data OECD, Global Data Center of Migration Information Source, Balance of Payments Database, IMF, Direction of Trade Statistics Database, IMF

Figure 3(c). Time Series Patterns in FDI and Trade Flows



Sources: Authors' calculations using data from International Migration Data OECD, Global Data Center of Migration Information Source, Balance of Payments Database, IMF, Direction of Trade Statistics Database, IMF

Table 1. Decomposing the Income Gap Between the Euro area and the CEC-8

	Capital Per Worker		Employment Rate		TFP			
	Per Capita Income (real PPP \$)	Income Ratio vs. Euro Area	US\$ per worker	Relative to Euro area (%)	Percent	Relative to Euro area (%)	Relative to Euro area (%)	
Czech Repul	17,937	69	50,016	34	64.2	102	304	40
Estonia	12,773	49	32,269	22	63.0	100	321	42
Hungary	15,399	59	41,295	28	56.8	90	336	44
Latvia	11,148	43	28,329	19	62.3	99	288	38
Lithuania	12,051	46	22,008	15	61.2	97	321	42
Poland	11,921	46	31,844	22	51.7	82	367	48
Slovakia	13,437	52	38,193	26	57.0	91	277	36
Slovenia	19,251	74	64,857	44	65.3	104	490	64

TFP is calculated as $Y/(K^{0.35}L^{0.35})$.

Source: Schadler, Mody, Abiad and Leigh (forthcoming)

Table 2: International Links: Developed with Developing Nations

	Trade	Trade	FDI	FDI	Migration	Migration
Per Capita Income	1.04***	0.87***	2.60***	2.55***	0.239	0.16
(Advanced)	[9.59]	[7.78]	[7.82]	[7.73]	[1.33]	[0.84]
Per Capita	1.04***	1.095***	1.55***	1.65***	-0.05	-0.03
Income(Developing)	[23.91]	[23.72]	[11.96]	[12.22]	[0.94]	[0.45]
Population(Advanced)	1.09***	1.07***	1.25***	1.25***	0.95***	0.92***
	[24.31]	[25.08]	[14.50]	[14.55]	[14.26]	[12.87]
Population(Developing)	1.12***	1.16***	1.29***	1.45***	0.79***	0.77***
	[31.50]	[37.20]	[16.71]	[16.03]	[21.03]	[16.64]
Distance	-1.14***	-1.23***	-1.66***	-1.61***	-1.35***	-1.40***
	[17.40]	[22.53]	[12.89]	[11.29]	[21.94]	[16.01]
Common language	0.85***	0.84***	0.09	0.09	2.44***	2.39***
	[3.08]	[3.21]	[0.21]	[0.20]	[4.06]	[5.25]
Common border	0.73**	0.667*	-0.249	0.124	1.849***	1.97***
	[1.99]	[1.93]	[0.38]	[0.20]	[5.52]	[5.78]
Colony	0.52	0.44	2.90***	2.72***	1.01	0.99
	[1.03]	[0.91]	[3.07]	[2.93]	[0.94]	[0.92]
CEEC5		-0.27*		-0.10		-0.39*
		[1.76]		[0.29]		[1.91]
Baltic		0.19		1.73***		0.78***
		[1.43]		[3.45]		[2.96]
Observations	2305	2305	2305	2305	2305	2305
Number of groups	382	382	382	382	382	382

All regressions were estimated using the tobit specification and include time fixed effects and country-pair random effects. Absolute values of z statistics are given in brackets. * indicates significance at 10%; ** significance at 5%; and *** significance at 1% level.

Table 3: International Links: EU-15 with Developing Nations

	Trade	Trade	FDI	FDI	Migration	Migration
Per Capita Income(Advanced)	1.54***	1.45***	4.72***	4.67***	1.05***	1.07***
	[14.95]	[13.74]	[13.23]	[12.77]	[3.62]	[3.96]
Per Capita Income (Developing)	0.87***	0.72***	1.72***	1.37***	-0.33***	0.01
	[16.32]	[15.11]	[10.87]	[9.20]	[4.32]	[0.12]
Population (Advanced)	1.08***	1.05***	1.31***	1.27***	0.52***	0.48***
	[19.60]	[17.60]	[12.89]	[11.48]	[6.53]	[5.95]
Population (Developing)	0.94***	0.81***	1.46***	1.29***	0.72***	0.48***
	[22.85]	[21.27]	[14.75]	[14.06]	[13.33]	[10.60]
Distance	-0.5***		-.93***		-1.6***	
	[5.57]		[4.62]		[14.18]	
Common language	0.29		1.19**		1.03	
	[0.80]		[1.98]		[1.16]	
Border	1.46***		0.87		2.09***	
	[4.13]		[1.44]		[7.36]	
Colony	0.52		2.29***		1.23	
	[1.08]		[2.75]		[1.14]	
CEEC5	0.66***	1.64***	1.28***	3.07***	-0.55**	0.59***
	[2.94]	[8.85]	[2.81]	[8.97]	[2.03]	[2.78]
Baltic	1.16***	1.45***	2.82***	3.84***	-0.51	0.69
	[5.99]	[7.17]	[5.17]	[7.23]	[0.86]	[1.13]
Observations	1532	1533	1532	1533	1532	1533
Number of groups	262	262	262	262	262	262

All regressions were estimated using the tobit specification and include time fixed effects and country-pair random effects. Absolute values of z statistics are given in brackets. * indicates significance at 10%; ** significance at 5%; and *** significance at 1% level.

Table 4: EU-15 and Developing Nation Links, including Correlations Between Flows

	Trade	Trade	Migration	Migration	FDI	FDI
Per Capita	1.52***	1.23***	0.95***	0.99***	4.35***	3.19***
Income(Advanced)	[14.76]	[11.29]	[3.13]	[3.58]	[11.83]	[8.29]
Per Capita Income	0.87***	0.94***	-0.19**	-0.21	1.71***	1.07***
(Developing)	[15.48]	[18.84]	[2.45]	[1.61]	[10.85]	[4.41]
Population(Advanced)	1.06***	1.03***	0.55***	0.34***	1.22***	0.19
	[19.13]	[20.53]	[6.59]	[3.28]	[11.91]	[1.12]
Population (Developing)	0.94***	0.99***	0.73***	0.79***	1.26***	0.77***
	[23.07]	[20.78]	[10.93]	[5.76]	[9.09]	[3.58]
Distance	-0.51***	-0.69***	-1.59***	-1.49***	-0.59**	-0.21
	[5.75]	[7.68]	[13.04]	[11.81]	[2.53]	[0.96]
Common language	0.27	0.32	1.09	1.04	1.01*	1.03*
	[0.76]	[1.00]	[1.21]	[1.19]	[1.66]	[1.85]
Border	1.44***	1.00***	1.98***	2.00***	0.68	-0.53
	[4.07]	[3.15]	[6.33]	[6.20]	[1.12]	[0.90]
Colony	0.49	0.31	1.22	1.11	2.07**	1.54**
	[1.03]	[0.74]	[1.07]	[1.02]	[2.50]	[1.97]
CEEC5	0.63***	0.25	-0.71**	-0.71**	1.61***	1.24***
	[2.80]	[1.23]	[2.56]	[2.40]	[3.49]	[2.83]
Baltic	1.15***	0.61***	-0.11	-0.69	2.93***	2.09***
	[5.93]	[3.59]	[0.35]	[1.16]	[5.43]	[4.05]
Bilateral FDI	0.019*		0.013			
	[1.94]		[0.80]			
Total FDI inflows	-0.003		-0.014*			
	[0.50]		[1.70]			
Bilateral Migration		0.062***			0.166***	
		[3.99]			[3.75]	
Total Migration		-0.12***			0.07	
		[3.86]			[0.68]	
Bilateral Trade				0.148***		1.129***
				[3.41]		[8.16]
Total Trade				-0.301**		-0.325
				[2.22]		[1.26]
Observations	1532	1532	1532	1532	1532	1532
Number of groups	262	262	262	262	262	262

All regressions were estimated using the tobit specification and include time fixed effects and country-pair random effects. Absolute values of z statistics are given in brackets. * indicates significance at 10%; ** significance at 5%; and *** significance at 1% level.

Table 5: EU-15 and Developing Nation Links, instrumenting for endogeneity of flows

	Trade	Trade	Migration	Migration	FDI	FDI
Per Capita Income(Advanced)	1.22*** [7.64]	0.76*** [3.87]	1.46*** [4.21]	-2.37*** [4.73]	2.58*** [3.75]	-0.48 [0.59]
Per Capita Income (Developing)	0.88*** [13.53]	0.89*** [16.45]	-0.02 [0.21]	-1.02*** [6.42]	1.98*** [10.44]	0.43 [1.51]
Population(Advanced)	1.04*** [17.45]	0.95*** [17.59]	0.69*** [7.39]	-1.75*** [5.67]	1.02*** [6.57]	-1.9*** [4.12]
Population (Developing)	0.93*** [19.56]	0.89*** [11.61]	0.86*** [12.19]	0.18 [1.13]	1.11*** [4.26]	0.25 [0.98]
Distance	-0.7*** [6.19]	-0.4*** [3.18]	-1.75*** [14.20]	0.35 [1.63]	-0.23 [0.46]	1.23*** [3.38]
Common language	0.32 [0.91]	0.19 [0.66]	1.23 [1.37]	0.95 [1.13]	0.68 [1.05]	0.87 [1.49]
Border	1.21*** [3.47]	0.86*** [2.69]	1.95*** [6.45]	0.72* [1.67]	0.12 [0.14]	-2.2*** [3.06]
Colony	0.39 [0.85]	0.28 [0.65]	1.48 [1.30]	-0.88 [0.83]	1.51 [1.40]	-0.33 [0.37]
CEEC5	0.28 [1.17]	0.39* [1.87]	-0.69** [2.50]	-0.89*** [3.13]	1.24** [2.39]	1.14*** [2.58]
Baltic	0.85*** [3.98]	1.12*** [4.65]	-0.61 [1.03]	0.47 [1.59]	2.93*** [4.85]	2.86*** [5.43]
Bilateral FDI (predicted)	0.03* [1.65]		-0.09*** [2.79]			
Total FDI inflows	-0.01 [0.98]		-0.01 [1.36]			
Bilateral Migration (predicted)		0.14* [1.85]			0.46 [1.62]	
Total Migration		-.14*** [4.55]			0.06 [0.52]	
Bilateral Trade(predicted)				2.41*** [9.52]		3.09*** [7.01]
Total Trade				-2.15*** [9.32]		-2.1*** [4.85]
Observations	1532	1241	1532	1532	1241	1532
Number of groups	262	235	262	262	235	262

All regressions were estimated using the tobit specification and include time fixed effects and country-pair random effects. Absolute values of z statistics are given in brackets. * indicates significance at 10%; ** significance at 5%; and *** significance at 1% level.