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Trade, Foreign Direct Investment and International Flow of Labor: OECD Countries

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This paper examines the effect of trade on the international movement of labor using migration data into 28 OECD countries. The effect of foreign direct investment on the flow of labor is also considered. The results show that the increased exports of a country lower the migration outflow, whereas increased imports work in the opposite direction. But the rise of bilateral trade raises migration flow into the partner country. Total foreign direct investment into a country does not affect the outflow of labor. But increased bilateral investment raises the movement of people into the investing country.

Keywords: Labor Migration, FDI, Bilateral Trade

1. INTRODUCTION

There are increasing researches and studies about the effect of migration both on the destination and origin countries of migration. The results show that international labor movement has both positive and negative effect on receiving and sending countries. While migration has a positive economic impact on the economy of destination countries, negative perception about migration in developed world is increasing. The United States is concerned about the growing Latin immigration and has adopted various policies to deter the growing number of migration inflows. The Mexico-U.S. border recorded one of the highest numbers of legal and illegal crossing among all the land borders in the world. The U.S. reinforced border security and is building a fence along the 1,920 km border between Mexico in the hope of slowing illegal immigration (BBC News, 2006a; BBC News, 2006b). There are growing concerns about increasing immigration in Europe as well. Since 9/11 the anti-migration sentiment has increased and has even led to spike of racism, xenophobia and islamaphobia. The European Monitoring Centre on Racism and Xenophobia (EUMC) said it had documented a wide range of anti-Muslim or Islamophobic abuse across the EU's 25 member states (BBC News, 2006c).

Migration is considered problematic and countries implement certain policies that may decrease immigration flows into developed worlds. Those policies can be categorized into two groups. The first is restrictive policies which are intended to limit unwanted immigrants and the second is development policies targeted towards the sending countries to eliminate the underlying fundamental causes of migration. Restrictive policies that are generally implemented are reinforced restrictive immigration law and regulations, intensified border control, carrier sanctions, deterrent policies and return migration policies (De Haas, 2007). In terms of development policies, developed countries promote social and economic development in migration sending countries through aids, investment and trade liberalization in the hope that development and increased wage level in sending countries would curtail motivation for migration (De Haas, 2007). Studies that support the development policy argue that migrant-receiving developed countries have to cooperate with the sending country to

manage the immigration flows by promoting free trade, investment and aid funds(Martin and Staubhaar, 2002). In the case of Mexico, it was argued that increased trade and investment in Mexico through the North America Free Trade Agreement (NAFTA) would reduce future migrant flow from Mexico to the U.S. (Cornelius and Martin, 1993). Former Mexican President Carlos Salinas de Gortari promoted NAFTA partly for this same reason (Aroca and Malony, 2002). However at the same time, there are also counter arguments posit that growing trade increases flow of labor. Thus, summarily, there are contradictory arguments about the relationship between trade and migration flow. There have not been enough empirical studies to explore this relationship thus far.

For these reasons, this paper will examine empirically how trade affects the international flow of labor. The analysis is based on bilateral migration flow into 28 OECD countries from 95 countries which include non-OECD countries between 1997 and 2006. This test will also verify how foreign direct investment affects the outflow of labor in migration sending countries.

2. LITERATURE REVIEW

International trade is the flow of goods between different countries. International migration and foreign direct investment are the flow of production factors, which are labor and capital, respectively. The relationship between trade and the movement of production factors have long been of interest for economists. The classic view about this relationship is that the increased trade between two countries will lead to the decreased movement of production factors. That is to say, trade is a substitute of the movement of production factors. However, there is an opposite view which argues that the rise of trade between countries will boost the flow of production factors; trade and the movement of production factor have a complementary relation.

According to the classic Hecksher-Ohlin trade model, when factor endowment is uneven across countries, each country tends to produce more goods that are intensive in the factors with which the country is relatively well endowed. The difference in relative price causes international trade. Trade will then lead to an equalization of international relative price of commodities that finally lies between the two different relative prices in each country. The convergence of relative prices of goods causes convergence of the relative price of production factors (Samuelson, 1948). International factor movement arises by the difference in relative prices of production factor, which is wage in the case of labor. Trade leads to the equalization of factor prices, including wages, between countries, which in turn reduces the incentive of international movement of labor. In other words, trade can lower the movement of labor by reducing the wage differential between countries. Using the same framework by Hecksher-Ohlin, Mundell (Mundell, 1957) explains that trade and international flow of labor can be substitutes.

The other classic paper which explains the relation between trade and migration was written by Markusen (Markusen, 1983). He shows the opposite result to Mundell and explains that trade stimulates the movement of factors. In both Mundell's and the Heckscher-Ohlin model, the cause of trade is the different endowment of production factors across countries. But Markusen shows that trade can occur while countries have identical endowments of production factors if at least one of the other assumptions of Hecksher-Ohlin model is relaxed. His model assumes increasing returns to scale, imperfect competition,

production and factor taxes, and the difference in production technology. Then he shows that trade can increase the international movement of labor in each condition. Mundell and Markusen suggest contrary explanations about how trade will affect the movement of labor. But what they have in common is that trade either increases or decreases the movement of labor by affecting the wages. While those two papers have opposite views about the relationship of trade and factor movement, substitution or complement, Schiff shows that both substitute and complement are possible in the Markusen's models depending on the tariff rate (Schiff, 2006). However, even if there are various views about the relation between trade and movement of factor, there is very limited empirical research analyzing it.

While the above studies focus on the relation between trade and the movement of labor, the movement of capital, which is the other production factor, can also affect the movement of labor. Among the various type of capital movement, this paper will focus on foreign direct investment. If the output of a country depends on the use of capital and labor, the real wage earned by each labor unit is equal to the labor's marginal product, and the change in capital stock will shift the output and marginal product of labor. If a country invests in another country, the workers of the host country will have more capital to work with, and the marginal product of labor will be higher than it would be in the absence of the capital movement. However, the workers in the investing country will have less capital available and the marginal product of labor will go down due to the reduced capital stock. The international movement of labor mainly occurs between developed and less developed countries. And labor from less developed countries flow into the developed world. When the investing country is high-wage, which is the destination for international movement of labor, and the invested country is low-wage, which is the origin country of international migration, foreign direct investment from the destination to the origin country will reduce the incentive for flow of labor by narrowing the wage gap between the two countries. In sum, foreign direct investment (FDI) from capital-abundant country, the destination of migration, to capital-scarce one, the origin of migration, would reduce the incentives of the migration by reducing the wage gap.

This paper will empirically show how trade and foreign direct investment affect the international movement of labor using the bilateral trade and migration data between 28 OECD member countries and their partners which include non-OECD member countries. The test will be based on the neoclassical microeconomic theory of international migration.

3. THEORETICAL FRAMEWORK

There are many factors which affect the decision of migration. Among various theories, neoclassical microeconomic theory of migration (Borjas, 1989; Massey *et al.*, 1993) explain how trade and foreign direct investment affect migration flow. The theory suggests that individual rational actors decide to migrate because the benefit of migration is larger than the cost. They compare the cost and the benefit and decide to migrate whenever the benefit is larger than the cost.

$$ER(0) = \int_0^n [P_1(t)P_2(t)Y_d(t) - P_3(t)Y_0(t)]e^{-rt}dt - C(0)$$

where,

ER(0): the expected net return to migration calculated before the departure at time 0

t: time
$P_1(t)$: the probability of avoiding deportation from the area of destination
$P_2(t)$: the probability of employment at the destination
$Y_d(t)$: the earnings if employed at the place of destination
$P_3(t)$: the probability of employment in the country of origin
$Y_0(t)$: the earnings if employed in the country of origin
r: discount factor
C(0): the sum of the costs of movement including psychological costs

According to the theory, the rational individual decides to migrate when ER(0), the expected net return to migration, is larger than 0. If ER(0) is 0, he or she is indifferent between migration and staying. If ER(0) is smaller than 0, the decision is to stay.

One of the important factors which affect the flow of labor are the wages in both destination and origin country, which are reflected in $Y_d(t)$ and $Y_0(t)$, respectively. As the wage gap between two countries widens, the net expected return to migration becomes higher. As seen from the literature review, trade and FDI can affect the wages of the two countries involved in the economic transaction. Therefore, trade and FDI can affect the movement of labor indirectly. But the predicted effect of trade on migration is not uniform across the studies, as mentioned before. For example, Mundell (1957) and Markusen (1983) predict opposite effect of trade on migration. Their different predictions were based on the assumptions of factor endowment; while Mundell assumes that countries are differently endowed with the production factors, Markusen assumes that countries have identical factor endowments. The United Nations estimated that about 60% of world's immigrants population resides in developed countries (Lowell, 2007). Statistics from OECD also shows that majority of migrants flow into more developed countries. Then the destination and origin countries of migration can be understood roughly as developed and less developed countries, respectively. Developed and less developed countries have different endowment of skilled and unskilled labor. The majority of migrants are unskilled labor with low level of education. Unskilled labors are more abundant in less developed countries. Then the Hecksher-Ohlin model which assumes different factor endowment in countries is closer to the reality. Thus it is expected that increased trade among countries will lower the outflow of labor as the model expects.

Previous studies explain that trade can affect international movement of labor by focusing on the effect on wages. Besides wages, trade can affect the flow of labor by influencing the costs of movement, C(0). In order to ship goods from one country to another, it is necessary to build and expand transportation and communication channel. However these channels not only facilitate the trade of goods but also promote the movement of labor by reducing the costs of movement. Because trade is accompanied by the build-up of transportation and communication infrastructure, international movement of labor generally follows the movement of goods and capital in the opposite(Massey *et al.*, 1993). Trade is expected to reduce the movement of labor by affecting wages. In terms of the cost of movement, trade now boosts migration.

Previously it was argued that FDI also affects the movement of labor by raising the wage in origin country and reducing the incentive for migration. In addition, FDI can lower the costs of movement like how trade does. FDI accompanies the build-up of transportation and communication links and facilitates the movement of people (Massey *et al.*, 1993).

It was explained that trade and FDI can affect the migration decision by changing the

wages both in destination and origin country and the costs of movement. It was mainly focused on bilateral trade and investment between destination and origin countries. But the trading or investing partner can be expanded to all countries in the world. Then, trade and investment with the world are also important factors that influence the movement of labor.

Two different variables can be adopted with respect to trade or FDI. One is bilateral and the other is trade and FDI with the world as a whole. The effect of trade and FDI on the costs of movement and on wages will differ in each case. The change in wage of a country is the result of summation of all the effect that its partner countries have on it, resulting in trade and FDI with the world as a whole have relatively strong effect on wages than bilateral trade and FDI do. The costs of movement, however, is bilateral concept which means physical and psychological costs to move from origin to destination country. Then bilateral trade and FDI will have relatively strong effect on the costs of movement.

If trade or FDI lowers the costs of movement, then it will raise out-migration from the origin country. In the bilateral case, trade and FDI have relatively stronger impact on lowering the costs of movement than narrowing the wage gap. Thus, it is expected that the increase of trade or FDI between origin and destination country will boost the out-migration rate from origin country by reducing the costs of movement.

Figure 1. Effect of Trade and FDI on the Costs of Movement and Wages

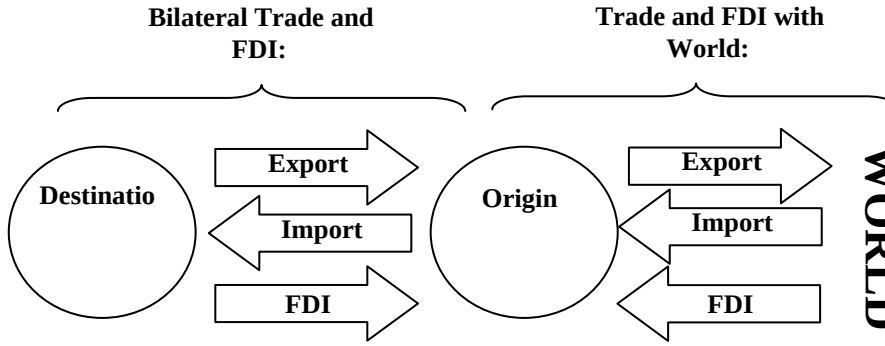

Table 1. Effect of Trade and FDI on the Costs of Movement and Wages

	Wage in Destination country, Y_d	Wage in origin country, Y_0	Effect on Migration	Costs of movement C(0)	Effect on Migration
Trade	Decrease	Increase	Decrease	Decrease	Increase
FDI	Decrease	Increase	Decrease	Decrease	Increase

Table 2. Effect of Trade and FDI on the Movement of Labor

	Bilateral (between destination and origin)	With the world
Trade	Increase	Decrease
FDI	Increase	Decrease

In case of trade or FDI with the world, the impact on wage will be larger than the effect on the costs of movement. According to Hecksher-Ohlin model and Mundell, trade will raise the wages in origin countries and it will result in the decreased incentives for migration. Also inward FDI in origin country flowing from the world is expected to lower the outgoing movement of labor. Table 1 and 2 summarize the expected effects of trade and FDI on the movement of labor.

4. EMPIRICAL RESULTS

The effect of trade and FDI on migration will be tested with the panel data of the inflow of foreign people into OECD countries. According to the theoretical framework, number of out-migrants in origin country into destination country is a dependent variable. Explanatory variables can be those which affect the costs of movement and the wages in both origin and destination countries. Also other economic factors which affect the probability of getting jobs in both countries will be considered.

The following equation was adopted for the empirical test:

$$\begin{aligned} LnMIG = {} & LnDist + DummyCBorder + DummyCLang + + LnGDP\_D + LnGDP\_O \\ & + LnPop\_D + LnPop\_O + LnBiEX + LnBiIM + LnWEX + LnWIM + \\ & + LnBiFDI + LnWFDI \end{aligned}$$

Where, *MIG* is the number of outgoing migrants from origin to destination country, and *Ln* means that it is in logarithm form. *Dist* is the distance between origin and destination country. *DummyCBorder* and *DummyCLang* are dummy variables for common border and common language, respectively. *GDP_D* and *GDP_O* are GDP of destination and origin country, respectively. *Pop_D* and *Pop_O* are population of destination and origin country, respectively. *BiEX* and *BiIM* are the export and import of origin country with respect to the destination country, respectively. *WEX* and *WIM* are total export and total import of the origin country, respectively. *BiFDI* is inward FDI to the origin country that flows from the destination country. *WFDI* is total inward FDI which the origin country receives from the world.

Annual data of bilateral migration between 1997 and 2006 was used for the regression. The destination countries consist of 28 OECD countries, whereas origin countries are 95 countries, including OECD and non-OECD countries. Trade data is also annual and covers the same period as migration data. However, as the data of bilateral FDI was available only from 2000 to 2006, the number of observations is reduced when this variable is included.

Table 3 shows the results of the regression with the number of migrants from the origin to destination country as dependent variable, and with fixed effects for years.

4.1. The Effect of Distance, Language and Border

The results show that distance impairs the movement of labor from origin to destination country. This is because the costs of movement increase with distance. Regression (1) of Table 3, shows that 1% increase in the distance between origin and destination country reduces the number of out-migrants by 0.251% from the origin country (significant at 1% level). In the case of common language, speaking the same language between destination and

Table 3. Determinant of Bilateral Migration Flow

Independent Variables	Reg. 1	Reg.2	Reg. 3
Constant	3.596***	0.212***	4.775***
	(6.889)	(3.873)	(11.251)
Ln Distance	-0.251 ***	-0.193***	-0.171***
	(-12.662)	(-8.860)	(-5.322)
Dummy Common Language	0.717***	0.685***	0.468***
	(13.830)	(13.031)	(5.848)
Dummy Common Border	-0.045**	-0.043**	-0.061***
	(-2.262)	(-2.175)	(-2.623)
Ln Population Destination Country	0.242***	0.242***	0.417***
	(6.795)	(6.784)	(7.844)
Ln Population Original Country	0.110***	0.113***	0.146***
	(5.383)	(5.420)	(4.745)
Ln GDP Destination	0.640***	0.581***	0.414***
	(20.892)	(18.022)	(7.986)
Ln GDP Origin	0.010	-0.042**	-0.108***
	(0.748)	(-2.547)	(-4.406)
Ln Export Origin to Destination		0.028*	
		(1.636)	
Ln Import Origin from Destination		0.039**	
		(2.125)	
Ln Export Origin to World		-0.038**	
		(-2.285)	
Ln Import Origin from World		0.035**	
		(2.145)	
Ln FDI Destination to Origin			0.105***
			(6.932)
Ln FDI into Origin from World			-0.008
			(-1.514)
Adjusted R^2	0.538	0.543	0.589
No. of observation	3229	3218	1503

*: significant at 0.1 level
**: significant at 0.05 level
***: significant at 0.01 level

origin country increases the out-migration from origin to destination country by 2.05 times (significant at 1% level). A common land border was expected to affect the migration positively like common language. The results, however, indicates that sharing common land border rather reduces migration between two countries (significant at 5% level), implying that migration occurs more frequently between countries that are not adjacent.

4.2. The Effect of Population and GDP

Population both in destination and origin country has positive effect on migration flow. According to the regression (1), when the population of destination country is 1% larger, the inflow of migrants from origin country is 0.242% larger (significant at 1% level). If the population of origin country is 1% larger, then the number of out-migrants to the destination country is 0.110% larger (significant at 1% level).

The out-migration is positively related to the GDP of the destination country but not to that of the origin country. It is expected that the poorest country has the highest tendency to migrate. However in reality, migrants in developed countries are neither from the poorest countries nor from the poorest families. Migration is a selective process, that is to say, the one who can afford the costs of the movement can decide to migrate (De Haas, 2007). Thus the regression result that GDP in the origin country does not affect migration significantly is compatible with the previous studies. The GDP of the destination country can be interpreted as level of development of an economy and absorption capacity of migrants. The outflow of labor in the origin country is positively related to the GDP of the destination country. According to the regression (1), 1% rise of GDP in destination country raises the out-migration flow from origin country by 0.640% (significant at 1% level).

4.3. The Effect of Trade

The results for the effect of trade on migration are interesting. Trade between two countries was considered separately by export and import. Both export and import in the perspective of origin country with the destination country are positively related to migration flow. In case of bilateral trade, it was expected that the effect on the costs of movement would be larger than the effect on wages and that bilateral trade would increase the migration flow by lowering the cost. The result of the regression (2) shows the expected signs. Both export and import between origin and destination countries heighten the movement of labor from origin country. A 1% increase of import from the destination to origin country implies 0.039% rise of migration flow from the origin to the destination country (significant at 5% level). A 1% increase of export from the origin to the destination country raises the migration 0.028% from the origin country (significant at 10% level). From the viewpoint of destination country, trade with migrant-sending country increments the flow of people from that country. Export has a stronger effect than import, its effect being about 1.4 times higher than the effect of import. According to the regression, trade policy which promotes trade with migrant-sending country to lower the immigrant numbers from that country will not give the expected results but lead to an increased immigration from the trade partner country.

Besides bilateral trade between origin and destination country, the effect of trade with world was also tested. The origin country's trade with world will have stronger effect on wage than on the costs of movement. The Hecksher-Ohlin model predicts that trade will lower the international movement of labor by narrowing the wage gap between two countries. But the results show that trade either raises or lowers the flow of labor; increased export to the world in origin country reduces the outflow of labor from origin country (significant at 5%) while import from the world increases migration (significant at 5%). Only the result for export corresponds to what Hecksher-Ohlin model expected. There is an explanation about why increased import in the origin country boosts the outflow of labor. Trade liberalization

in developing countries is associated with increases in capital intensive machinery imports which are bundled with technology. Then increased imports in developing countries accelerate technology diffusion from developed to less developed countries. It is so called Skill-Enhancing-Trade (SET). SET increases the demand for skilled labor who can work with imported machinery and the relative wage of skilled labor rises (Robbins, 1996). That is to say, the wage differential between skilled and unskilled labor in developing countries widens as the imports increase. The majority of migrants are from developing countries and they are non-skilled labor. If the relative wage of non-skilled workers decreases in origin country, the incentive for migration rises. Then, the increased import of origin country will stimulate the outflow of labor. Thus, the result of the regression that the imports in origin country are positively related to the migration number can be explained by SET.

4.4. The Effect of Foreign Direct Investment

Bilateral foreign direct investment is expected to raise the outflow of labor from origin to destination country by lowering the costs of movement. The result coincides with what was expected. As can be seen from regression (3) in Table 3, When destination country increases FDI into origin country by 1%, the migration from origin to destination country rises by 0.105% (significant at 1% level).

Total FDI into origin country from world is expected to reduce the migration outflow from the origin country. The result shows that the rise of total FDI into the origin country reduces the out-migration. But the effect is not that significant statistically. Total inflow of FDI in origin country is supposed to raise the wage then lower the incentive for migration. There are studies analyzing how FDI affect the wage in host country with firm level analysis. They show that foreign firms tend to provide higher wage than their domestic counterparts. The evidence is shown in the study of Mexico, U.S., Venezuela, Indonesia and some Sub-Saharan countries. But other studies with worker-level data challenge what the firm-level analysis suggested. The results show that foreign takeovers have, at best, a small positive effect on wages and the effect could be negative (Arnal, 2008). OECD tested the impact of FDI on the wage of five countries, Brazil, Indonesia, Germany, Portugal and the United Kingdom. The results indicate that MNEs tend to provide high wage relative to the wage prevailing in the countries where they operate (Arnal, 2008). While the impact of FDI on wage is mixed across the studies, the overall evidence shows that FDI tends to raise the wage level in host countries. But the positive wage effect is concentrated on the workers who are employed by foreign firms. It was expected that FDI would raise the wage level in origin country and it would result in the decline of outflow of labor. But the test results about how total FDI inflow in origin country affect the out-migration level was not statistically significant. It may be due to the limited wage effect. Even though FDI tends to increase wages, the impact is limited on workers in foreign firms. The foreign MNEs should occupy significant share in domestic economy to raise the total wage level of a country. If not, the wage impact in foreign firms may not large enough to raise the total wage of a country. Thus the results show that the effect of FDI is not statistically significant.

In summary, for bilateral trade and FDI, it was expected that the impact for lowering the costs of movement would be larger than the effect for reducing the wage gap between two countries. If this is true, bilateral trade and FDI would promote the outflow of labor from origin to destination country. The estimated coefficients for bilateral trade and FDI have the expected sign and it indicates that the increase in trade and FDI between migrant-sending

origin and migrant-receiving destination country will stimulate the movement of labor from origin to destination. Origin country's total FDI inflow and total trade were expected to increase the wage level of origin country and to reduce the incentive for migration. In the regression results, total exports of origin country to the world and total inward FDI from the world are negatively related to the outflow of labor as expected. But the effect of FDI was not statistically significant. One interesting result was that the increase in imports rather boosts the outflow of labor. This can be explained by Still-Enhancing-Trade (SET) where the increased import of technology-bundled capital goods raises the relative wage of skilled workers thus results in the increased incentive for migration of unskilled labor. FDI was expected to reduce the outflow of migration by raising the wage level of origin country, but the result indicates that the impact is not significant statistically. There are previous studies which explain that foreign firms tend to compensate better than domestic firms. But the positive wage impact is limited on the works hired in foreign firms. Then the impact of FDI for increasing the total wage level of a country will be weak or negligible.

5. CONCLUSION

Globalization facilitated the movement of goods and capital but the movement of labor is still limited. While trade and investment are affecting the economy of one country positively, international migration is often considered to have negative effects. There are growing concerns in developed countries with the rise of international migration and adopt various policies to reduce the inflow of foreign labor. Some expect that increased trade and investment with less developed world will reduce the inflow of migrants into developed world. This is based on one traditional view on migration flow and trade, which says migration and trade are substitutive. There is opposite argument saying that trade can rather boost the out-migration flow from less developed world. But there is not enough empirical evidence which shows the relation between trade and migration, or foreign investment and migration

This paper examined the relation between trade and migration and between foreign direct investment and migration with data of migration flow into 28 OECD countries. The results indicate that increased bilateral trade and FDI between migrant-sending origin and migrant-receiving destination country will stimulate the movement of labor from origin to destination. This is expected due to the lowered costs of movement that is accompanied by the built-up of transportation and communication links which facilitate the movement of goods, service and capital. Increased import of an origin country from the world also promotes the outflow of people. But increased exports in the origin country reduce the outflow of labor. This is expected to be due to the increased wage level in the origin country, which lowers the incentives for migration. Total FDI into an origin country from the world does not affect the movement of labor significantly. In summary, migration can be lowered only by increasing the total export level of a country. If developed countries want to reduce the immigration level from less developed countries, the former countries as a group should import more from the latter ones as a group, and let them expand their exports. If trade is increased only between destination and origin country, it will rather stimulate the migration from origin country.

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DATA SOURCE

1. Bilateral migration data
   International Migration Outlook 2008
2. Gross Domestic Product and population data
   World Economic Outlook Databases
3. Export and import data
   United Nations Commodity Trade Statistics Database.
4. Distances
   Jon Haveman's International Trade Database

City Distance Tool by GEOBYTES

5. Foreign Direct Investment
OECD.Stat Extract database

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