

THE INTENSITY OF BILATERAL RELATIONS IN INTRA-UE TRADE AND DIRECT INVESTMENTS: ANALYSIS OF VARIANCE AND CORRELATION

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Abstract

The fundamental goal of my paper is to investigate intensities of FDI relationships (in comparison with trade intensities) between EU Member States during the period 1985–2008. I am able to create two maps presenting two most important international links between EU Member States. These maps allow me to identify fundamental features of the EU countries in intra-EU direct investments and trade. Moreover, I conduct ANOVA of FDI intensity indexes, in order to check whether values of each index differ due to memberships to EU-6, EU-15, new EU-10(12), euro area or due to possession of common border. Finally, analysis of correlation between trade and FDI intensity index for each pair of countries reveals whether these two kinds of links are rather complements or substitutes in bilateral relations. Analysis of correlation is supported by case studies of FDI and trade relationships between selected EU Member States.

My research is based mainly on Eurostat, OECD and UNCTAD data all concerning bilateral trade and FDI relationships between EU Member States.

In order to assess the intensity of bilateral relationships I compute trade and FDI intensity indexes. Both indicators are based on Srivastava's and Green's concept of measuring bilateral trade intensity. Trade intensity index is namely a ratio that compares the actual value of trade between two countries with expected value of bilateral trade determined by world position of each country in global trade. Using actual amount of FDI stock into one country from another combined with use of the world position of these two countries in inward and outward FDI stock respectively allow me to compute also FDI intensity indexes.

Keywords: trade intensity index, FDI intensity index, intra-UE trade, intra-UE direct investments

JEL codes: F14, F15, F21

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1. Background studies on bilateral FDI relationships

Bilateral trade relations and their intensity have appeared as one of the fundamental topics in international economics. Gravity model² (in basic or modified version) has become an important analytical tool to examine a wide spectrum of determinants of bilateral trade flows. Therefore, trade intensity indexes developed by Brown [1949], Kojima [1964], Srivastava and Green [1986] allowed to assess whether the value of trade between two countries is greater or smaller than would be expected on the basis of their importance in world trade. Additionally, Frankel [1997] introduced an index concerning trade intensity of “regional trading blocs” in order to assess whether a region exports more (as a percentage) to a given destination than the world does on average. Empirical evidences based on various gravity models of trade and various trade intensity indices belong to a wide spectrum of studies concerning bilateral trade relationships.

Unlike trade flows, there has been less examination of bilateral FDI relationships. Studies concerning FDI have focused rather on inflows (outflows) or inward (outward) stock to (from) single country or group of countries (region) than on bilateral FDI flows and their intensity. However, a number of analytical tools from analysis of international trade have been adapted to examination of FDI, also bilateral FDI relationships.

Firstly, variables used in gravity models of trade (e.g. market size, geographic or economic distance, cultural similarity, membership in particular regional integration agreements) can be also important determinants of bilateral FDI relations. Consequently, there are studies using gravity model specification to examine bilateral flows of FDI (e.g.; Hattari, Rajan [2009]; Petri [2010]; Stone, Jeon [1999]). These gravity models of FDI include variables concerning: supply conditions at home country and demand conditions at host country (market size, income, real economic growth, and financial markets indicators), geographic distance, transactional and informational distance and also quality of institutions. These studies showed ambiguous impact of these variables on bilateral FDI relations.

Apart from gravity model bilateral FDI relations have also been scrutinized in other contexts. Desbordes, Vicard [2009] investigated the effect of implementation of bilateral investment treaties on bilateral stocks of foreign direct investment. They showed that the effect of entry into force of bilateral treaty crucially depends on the quality of political relations between signatory countries; it increases FDI more between countries with tense

² Conception developed for example by Helpman, Krugman, Linder, Feenstra, Markusen, Rose.

relationships than between friendly countries. Therefore, Benassy-Quere, Coupet and Mayer [2007] investigated institutional determinants of FDI and found that the similarity of institutions between the host and home country raises bilateral FDI flows. Additionally, Choi [2004] examined the role of FDI in convergence of income level and growth. Panel analysis brought conclusion that income level and growth gaps between source and host countries decrease as bilateral FDI increase.

Finally, UNCTAD [2007, pp. 19–22] includes studies concerning bilateral FDI relationships based on FDI intensity index. In my paper, I develop the idea of FDI intensity index in order to measure the intensity of intra-EU direct investment relations. Moreover, I compare intensities of trade and intensities of FDI relationships between EU Member States during last twenty years.

2. Methodology of measuring the intensity of bilateral FDI relationships

In order to assess the intensity of FDI relationships between a host country and home country, I use the FDI intensity index based on idea of the trade intensity index developed by Srivastava and Green [1986]³. The FDI intensity index between host country (*i*) and home country (*j*) is equal the ratio that compares actual value of stock in country *i* coming from country *j* with expected value given the world position of each of them as host and home countries respectively.

$$\text{FDI intensity index } (ij) = \frac{FDI(ij)}{EV(FDI(ij))}$$

$FDI(ij)$ – Actual value of inward FDI stock in home country (*i*) originating from home country (*j*)

$EV(FDI(ij))$ – Expected value of inward FDI stock in country *i* originating from country *j*

$$EV(FDI(ij)) = \frac{FDI(iw)}{FDI(w)} \cdot \frac{FDI(wj)}{FDI(w)} \cdot FDI(w)$$

$EV(FDI(ij))$ – Expected value of inward FDI stock in country *i* originating from country *j*

$FDI(iw)$ – Actual value of total (global) inward FDI stock in country *i*

$FDI(wj)$ – Actual value of total outward FDI stock originating from country *j* (in the world)

$FDI(w)$ – Actual worldwide inward or outward stock

³ A similar assessment of intensity of FDI relationships was proposed by UNCTAD [2007]; also by Petri [1994] and Dunning, Fujita and Yakowa [2007] in the context of regional FDI flows.

If the FDI intensity index is greater than 1, the bilateral FDI relationship between country *i* and country *j* is stronger than would be expected based on the relative importance of the two economies as host and home; if it is less than 1 weaker than expected⁴.

I use FDI stocks (instead of flows) in calculating the value of FDI intensity index from two reasons⁵. Firstly, in the case of disinvestment the value of flows is negative. It would be debatable how to compute the FDI intensity index in such cases. The value of stocks as accumulated flows in almost all cases is positive number. However, if stock is negative, I do not compute the FDI intensity index. Secondly, FDI stocks represent long-term investment position of host or home country in the world FDI. Flows represent short-term (annual) investment position and are more exposed than stocks to short-term or accidental fluctuations, especially in the cases of small countries.

3. The intensity of bilateral FDI relationships between EU Member States

An analysis of the average intensity of FDI relationships between EU Member States brings the following conclusions. Firstly, since 1995 the average value of FDI intensity index between EU countries has been greater than 1, suggesting increased regional integration through FDI (see table 1).

Table 1. The average FDI intensity between EU Member States^a, 1995–2008

Year/Indicator	Average* FDI intensity index	Standard deviation /Average FDI intensity index
1995	2.53	133.93%
1996	3.02	162.00%
1997	3.42	162.88%
1998	5.19	200.46%
1999	5.54	196.47%
2000	5.54	195.70%
2001	11.30	247.66%
2002	11.10	238.99%
2003	9.17	221.99%
2004	6.65	873.96%
2005	7.20	455.71%
2006	7.32	436.56%
2007	6.74	248.83%
2008	8.44	293.78%

^a 1995–2003 data for 15 EU Member States; 2004–2006 for 25 States and 2007–2008 for 27 States

* weighted average; weight refers a share of single bilateral FDI relation in total intra-EU direct investments stocks

Source: Own study based on Eurostat and UNCTAD data

⁴ For example, if I consider FDI inward stock in France originating from Germany in 2000. France is host country (*i*) and Germany is home country (*j*). France's inward FDI stock accounted for 4.51% of the world inward stock ($FDI(iw)/FDI(w)=4.51\%$). Germany's outward FDI stock accounted for 8.93% of the world outward stock ($FDI(wj)/FDI(w)=8.93\%$). Consequently, $EV(FDI(ij))=4.51\%*8.93%*FDI(w)=25108.55$ [EUR, millions]. Actual value of FDI stock in France coming from Germany in 2000 was $FDI(ij)=31825$ [EUR, millions]. Accordingly, the FDI intensity index (*ij*) was $31825/25108.55=1.27$. The FDI bilateral relationship between France as a host economy and Germany as a home economy was stronger than expected relationship.

⁵ Also UNCTAD recommends using stocks instead of flows in order to assess the intensity of FDI relationships.

This result remains in accordance with theory and empirical evidence of investment creation effect (see e.g. Baldwin, Forslid and Haaland [1996]; Motta, Norman [1996]). Investment creation effect means intensification of FDI flows between countries participating in regional integration. However, data concerning earlier years (1985–1994) reveal the average FDI intensity index lower than 1 (see table 2). On one hand, it suggests that before 1995, during the process of European single market establishing, investment creation effect was weaker. Before Treaty of Maastricht, regional integration had an impact rather on intensification of trade than FDI flows between member countries. On the contrary, the value of average FDI intensity index was not very much lower than 1 and it was increasing. It suggests that the investment creation effect was gathering momentum. Additionally, analyzed average can be underestimated due to gaps in database.

Table 2. The average FDI intensity between EU Member States^a, 1985–1994

Year/Indicator	Average ^b FDI intensity index	Standard deviation /Average FDI intensity index
1985	0.86	81.87%
1986	0.71	107.46%
1987	0.57	119.28%
1988	0.77	107.02%
1989	0.81	94.55%
1990	0.94	105.33%
1991	0.89	87.85%
1992	0.97	89.46%
1993	0.99	95.08%
1994	0.99	93.95%

^a 1985 data for 10 EU Member States; 1986–1994 for 12 States

^b simple average; data available for about 50% of all intra-EU bilateral links

Source: Own study based on OECD data

Therefore, probably due to EU enlargement in 2004 and 2007 the average FDI intensity index decreased. Statistical effect of enlargement occurred also in 1986 (accession of Portugal and Spain), but did not happen in 1995. Apart from few episodes, generally since 1985 the average FDI intensity index has increased. Another feature of intra-EU bilateral relations is very high statistical dispersion (see table 1 and 2). The value of standard deviation in relation to the average FDI intensity index has varied from about 80% to even almost 900%. So high variability is mostly caused by very high value of index in relation with country (or between two countries) with mere importance in global FDI – relations with Luxembourg, Austria, Finland, Slovenia, Slovakia, Czech Republic, Cyprus, Malta, Baltic countries or relations between new member countries, especially between Baltic countries. Some of these countries' shares in worldwide FDI inward (outward) are even below 0.1% (all are below 1.0%). Consequently, expected value of bilateral FDI stock is extremely low. This combined with relatively much higher actual value of bilateral FDI stock leads to indexes

greater than 10 and in some cases greater than 100⁶. Calculations based on FDI stocks, instead of flows, allow me to reduce number of these extreme cases and reduce to some extent the value of standard deviation.

Very high dispersion forced me to conduct analysis of variance in order to explain it. I divide set of FDI intensity indexes into a few groups. Groups refer to the time of accession to the EU (EU-6, EU-12, EU-15, new EU-12, etc.), participation in euro zone and also to fact whether host and home economy are neighbouring countries. I calculate averages within groups and sum of squares between groups (BSS) which measures the variation between groups⁷. η -indicator which refers the share of BSS in TSS (total sum of squares) allows me to assess the impact of membership in groups on value of the FDI intensity index (see table 3).

Table 3. The FDI intensity between EU Member States^a, 1995–2008: analysis of variance

Groups	1995–2003	1995–2008	1999–2008	1995–2008
	<ul style="list-style-type: none"> • Home and host country belong to core of the EU* • Home and host country belong to new EU–6 • Home country belongs to core of the EU (new EU–6) and host country belongs to new EU–6 (core of the EU) 2004–2006 <ul style="list-style-type: none"> • Home and host country belong to EU–15 • Home and host country belong to new EU–10 • Home country belongs to EU–15 (new EU–10) and host country belongs to new EU–10 (EU–15) 2007–2008 <ul style="list-style-type: none"> • Home and host country belong to EU–15 • Home and host country belong to new EU–12 • Home country belongs to EU–15 (new EU–12) and host country belongs to new EU–12 (EU–15) 	<ul style="list-style-type: none"> • Home and host country joined the EU at the same time • Home and host country joined the EU at different time 	<ul style="list-style-type: none"> • Home and host country belong to euro zone • Home and host country do not belong to euro zone • Only home (host country) belongs to euro zone 	<ul style="list-style-type: none"> • Home and host countries are neighbouring countries • Home and host countries are not neighbouring countries
Year/Indicator	$\eta = \sqrt{\frac{BSS}{TSS}}$ **	$\eta = \sqrt{\frac{BSS}{TSS}}$ **	$\eta = \sqrt{\frac{BSS}{TSS}}$ **	$\eta = \sqrt{\frac{BSS}{TSS}}$ **
1995	0.2019	0.1688	-	0.2154
1996	0.2029	0.1779	-	0.2088
1997	0.2255	0.2165	-	0.2472
1998	0.2275	0.2490	-	0.2473
1999	0.2322	0.2493	0.2197	0.2469
2000	0.2684	0.2741	0.2453	0.2632
2001	0.3109	0.2988	0.2782	0.2812

⁶ Especially in relations with Luxembourg, which play significant role in the EU as tax heaven (offshore financial centre), values of indexes are extremely high. Luxembourg's share in worldwide inward (outward) FDI stocks is relatively low, but actual value of flows into (from) Luxembourg is very high (capital flows driven by tax avoidance).

⁷ TSS (total sum of squares)=BSS (sum of squares between groups)+WSS (sum of squares within groups).

2002	0.3398	0.3101	0.2882	0.2994
2003	0.3166	0.2873	0.2740	0.2584
2004	0.1071	0.1330	0.1552	0.1384
2005	0.1165	0.1010	0.1889	0.1960
2006	0.1228	0.1116	0.1900	0.1997
2007	0.1086	0.0943	0.0968	0.0747
2008	0.1102	0.1024	0.0933	0.0901

^a 1995–2003 data for 15 EU Member States; 2004–2006 for 25 States and 2007–2008 for 27 States

^{*} Germany, France, Belgium, Netherlands, Luxembourg and Italy

^{**} BSS – Sum squares between groups; TSS – total sum squared

Source: Own study based on Eurostat and UNCTAD data

In all proposed by me divisions and in all years the value of η -indicator is lower than 0.5 what means that majority of TSS accounts for WSS. It is evidence against hypothesis indicating that value of the FDI intensity index varies significantly across proposed groups. Consequently, as majority of total variance is explained by variance within groups, factors such as: time of accession to the EU, participation in euro zone or being neighbouring countries do not impact significantly on value of the FDI intensity index between host and home country. Magnitude and direction of bilateral FDI flows (stocks) is determined rather by economic characteristics of both host and home country than by belonging to old (new) EU, monetary union or by having common border. This conclusion remains in accordance with results of studies conducted by Balasubramanyam, Sapsford and Griffiths [2002] who investigated whether presence of regional integration agreements determines bilateral FDI flows. Their analysis confirmed that individual characteristics of host or home economies are more important determinants of FDI flows than membership in regional integration agreements.

Additionally, it is worth to notice that the value of η -indicator in all four cases decreased after EU enlargement in 2004 and 2007. Higher number of member countries has made influence on the size of each group and naturally has caused the increase of variance inside of each group (another statistical effect of enlargement). Therefore, my analysis of variance confirmed complexity of FDI determinants. FDI flows cannot be actually well explained by one simple factor as each investment decision is made on the basis of wide spectrum of factors.

4. Correlation between intra-EU trade and direct investment intensities

After investigation of the nature of the FDI intensity between EU Member States, I examine the correlation between trade and FDI intensity indexes⁸ concerning bilateral

⁸ The trade intensity index based on the similar methodology as the FDI intensity index: import instead of inward stock and export instead of outward stock.

relationships between EU member countries. Due to high variance of FDI intensity index I use Spearman’s correlation index (instead of Pearson’s index which is more vulnerable to extraordinary observations and examines only potential linear correlation).

Table 4. Correlation between the FDI intensity index and the trade intensity index in intra-EU FDI and trade relationships, 1995–2008

Year/Indicator	Spearman correlation index
1995	0.4527
1996	0.4837
1997	0.4593
1998	0.4620
1999	0.2763
2000	0.4003
2001	0.3848
2002	0.3993
2003	0.4581
2004	0.4345
2005	0.2430
2006	0.3887
2007	0.2701
2008	0.3781

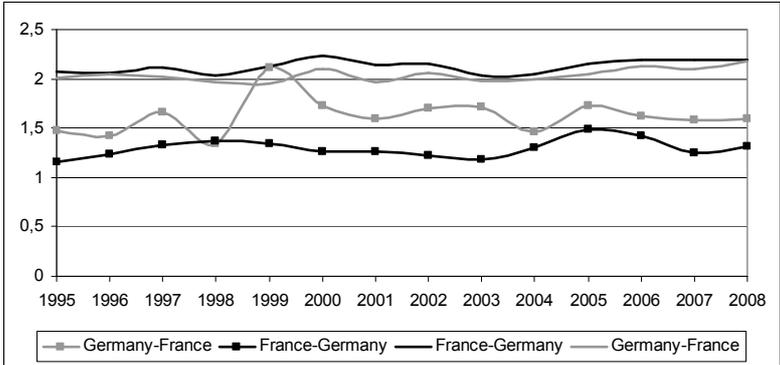
^a 1995–2003 data for 15 EU Member States; 2004–2006 for 25 States and 2007–2008 for 27 States
 Source: Own study based on Eurostat and UNCTAD data

Spearman’s indexes reveals weak or average correlation between the FDI intensity index and the trade intensity index in intra-EU FDI and trade relationships (see table 4). Correlation index does not bring unequivocal answer whether FDI flows and trade flows are complements or substitutes in bilateral relations between EU Member States. Consequently, it is worth to investigate trade and FDI intensities between selected EU economies (case studies).

5. Intensities of bilateral FDI and trade relationships between selected EU Member States

Germany, France, Netherlands, the United Kingdom belong to the most important partners in intra-EU direct investment and trade. FDI intensities of Germany (as a host

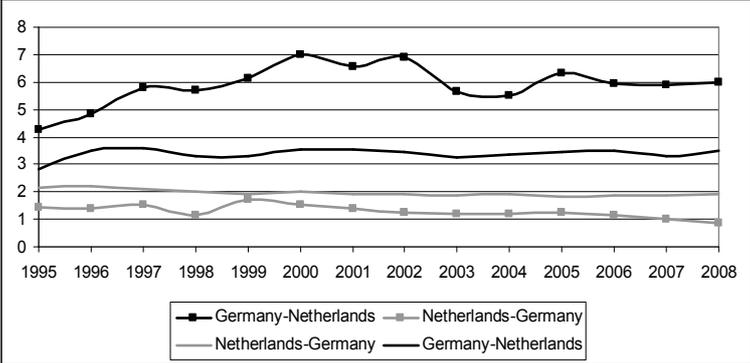
Figure 1. FDI and trade intensities^a between Germany and France, 1995–2008



^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter
 Source: Own study based on Eurostat and UNCTAD data

country) with France and Netherlands have been larger than one since 1995, what confirms strong FDI bilateral relationships. Likely to direct investments, also trade relations with these two partners have been strong, however with France trade intensity has been higher than FDI intensity, with Netherlands has been lower (see figure 1 and 2). FDI and trade intensities of Germany with the United Kingdom have been lower than with France and Netherlands (see figure 6).

Figure 2. FDI and trade intensities^a between Germany and Netherlands, 1995–2008

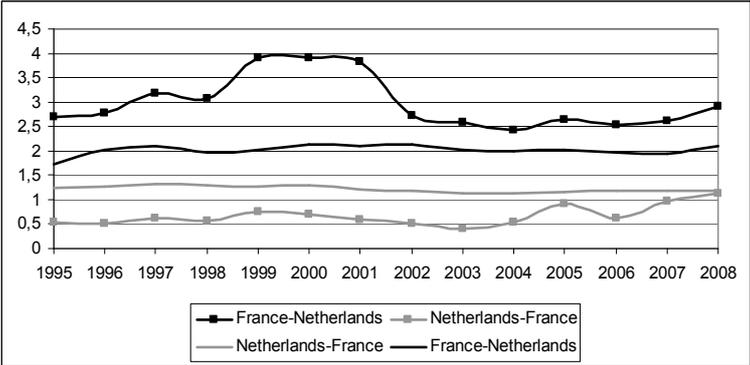


^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter

Source: Own study based on Eurostat and UNCTAD data

Both FDI and trade intensities of Netherlands (as host country) with Germany and the United Kingdom have been greater than 1 since 1995 and trade intensities have outstripped FDI intensities (see figure 2 and 5). The relationships with France have been weaker, but also trade relations have been more intensive (see figure 3).

Figure 3. FDI and trade intensities^a between France and Netherlands, 1995–2008



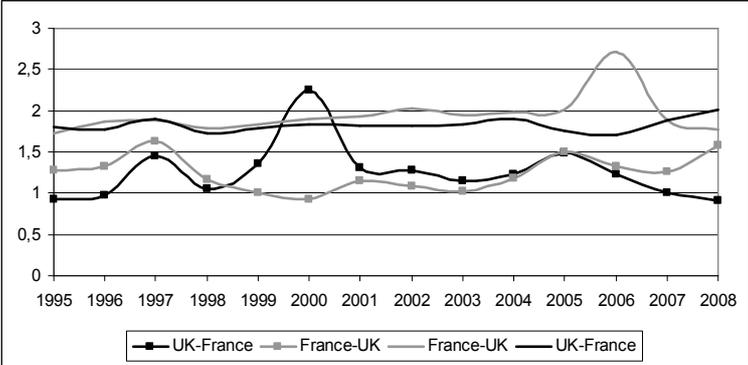
^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter

Source: Own study based on Eurostat and UNCTAD data

Since 1995, FDI and trade intensities of France (as a host economy) with these three major EU partners have been greater than 1, what confirms strong bilateral relationships. In

relations with the United Kingdom and Germany strength of trade relationships has been higher, but in relation with Netherlands direct investments have been more important (see figure 1, 3 and 4).

Figure 4. FDI and trade intensities^a between France and United Kingdom, 1995–2008

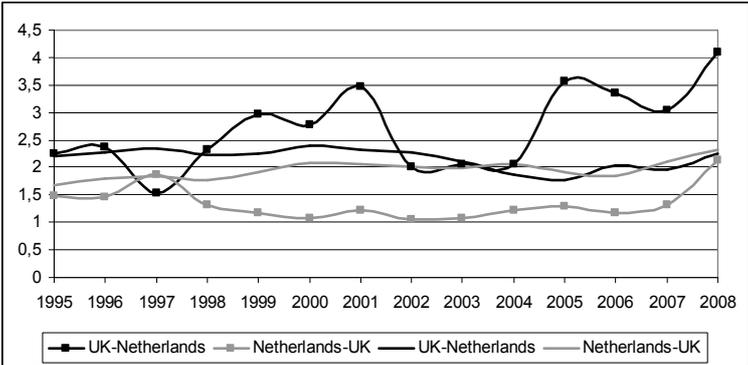


^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter

Source: Own study based on Eurostat and UNCTAD data

Both FDI and trade intensities of the United Kingdom (as a host country) with France and Netherlands have been greater than 1 since 1995, while FDI relationships with Germany have remained weaker. Only in relations with Netherlands, the value of FDI intensity index has exceeded the value of trade intensity index (see figure 4, 5 and 6).

Figure 5. FDI and trade intensities^a between Netherlands and United Kingdom, 1995–2008

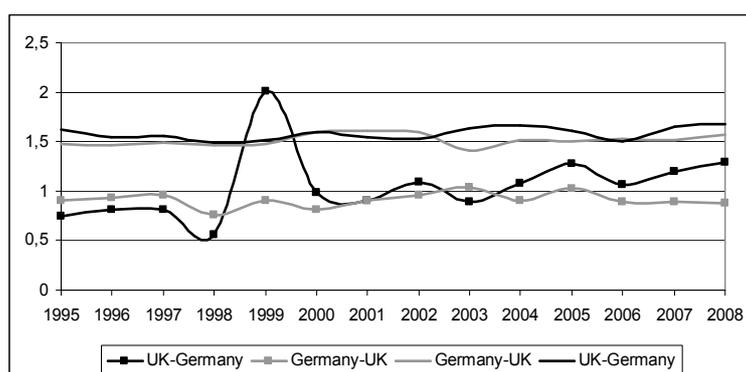


^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter

Source: Own study based on Eurostat and UNCTAD data

Generally, the fluctuations of trade intensity indexes have been weaker, what confirms that intensity of trade relationships is more stable. On the contrary, the FDI intensities varies in time relatively stronger, however in the cases of big economies FDI intensity indexes do not achieve extremely high values (e.g. higher than 10 or even 100). Such extraordinary results may appear in FDI relationships with relatively smaller countries (see table 5).

Figure 6. FDI and trade intensities^a between Germany and United Kingdom, 1995–2008



^a Line with squares refers FDI intensity index of host country with home country; pure line refers FDI trade intensity between importer and exporter

Source: Own study based on Eurostat and UNCTAD data

Finally, I examine the intensity of FDI relationships with Poland as the bigger country among new EU Member States. Since 2004, Poland as a host country with major EU economies such as: Germany, France and Netherlands have had strong FDI relationships. The intensities of reverse relationships (Poland as a home country) have been definitely weaker. Poland has appeared as a relatively important recipient of FDI, but Polish FDI in EU–15 countries has been still lagging (see table 5).

Table 5. FDI intensities between Poland and selected EU Member States, 2004–2008

Host Economy-Home Economy	2004	2005	2006	2007	2008
Poland-Germany	1.63	2.00	1.88	1.88	1.86
Germany-Poland	1.59	0.67	0.38	0.33	n/a
Poland-France	1.44	1.61	1.36	1.32	1.32
France-Poland	2.41	1.73	1.03	1.20	2.49
Poland-UK	0.23	0.32	0.33	0.32	0.43
UK-Poland	0.05	0.08	0.14	0.09	0.09
Poland-Netherlands	3.66	3.93	3.24	3.26	3.88
Netherlands-Poland	0.12	0.17	0.37	0.08	0.13
Poland-Czech Republic	3.24	4.19	3.17	5.73	3.52
Czech Republic-Poland	1.76	21.75	8.66	13.25	8.97
Poland-Slovakia	6.77	12.42	4.50	7.88	6.91
Slovakia-Poland	1.37	1.51	1.18	1.50	2.66
Poland-Lithuania	n/a	1.21	2.36	2.66	n/a
Lithuania-Poland	49.19	29.17	194.20	138.20	45.67

Source: Own study based on Eurostat and UNCTAD data

The FDI intensities with other new EU member countries are highly differentiated and in some relationships FDI intensity indexes have achieved extremely high value. It confirms earlier statements that FDI intensities with countries with mere importance in global FDI are exposed to strong fluctuations⁹.

⁹ For example, extremely high value of FDI intensity index of Poland as a home country with Lithuania was caused by substantial investments made by one oil Polish company in Lithuania.

References

1. Balasubramanyam V. N., Sapsford D., Griffiths D. [2002], *Regional integration agreements and foreign direct investment: Theory and preliminary evidence*, “The Manchester School”, Vol. 70, Iss. 3, pp. 460–482
2. Baldwin R. E., Forslid R., Haaland J. I. [1996], *Investment Creation and Diversion in Europe*, “The World Economy”, Vol. 19, Iss. 6, pp. 635–659
3. Benassy-Quere A., Coupet M., Mayer T. [2007], *Institutional Determinants of Foreign Direct Investment*, “The World Economy”, Vol. 30, Iss. 5, pp. 764–782
4. Brown A. J. [1949], *Applied economics aspects of the world economy in war and peace*, George Allen & Unwin, London
5. Choi Ch. [2004], *Foreign direct investment and income convergence*, “Applied Economics”, Vol. 36, Iss. 10, pp. 1045–1049
6. Desbordes R., Vicard V. [2009], *Foreign direct investment and bilateral investments treaties: An international political perspective*, “Journal of Comparative Economics”, Vol. 37, Iss. 3, pp. 372–386
7. Dunning J. H., Fujita M., Yakova N. [2007], *Some macro-data on the regionalization/globalization debate: a comment on the Rugman and Verbeke analysis*, “Journal of International Business”, Vol. 38, Iss. 1, pp. 177–199
8. Frankel J. A. [1997], *Regional trading blocs in the world economic system*, Institute for International Economics, Washington
9. Hattari R., Rajan R. S. [2009], *Understanding bilateral FDI flows in developing Asia*, “Asian-Pacific Economic Literature”, Vol. 23, Iss. 2, pp. 73–93
10. Kojima K. [1964], *The pattern of international trade among advanced countries*, “Hitotsubashi Journal of Economics”, Vol. 5, Iss. 1, pp. 16–36
11. Motta M., Norman G. [1996], *Does economic integration cause foreign direct investments?*, “International Economic Review”, Vol. 37, Iss. 4, pp. 757–783
12. Petri P. A. [1994], *The regional clustering of foreign direct investment and trade*, “Transnational Corporations”, Vol. 3, Iss. 2, pp. 1–24
13. Petri P. A. [2010], *The Determinants of Bilateral FDI: Is Asia different?*, Working Paper Series
14. Srivastava R. K., Green R. T. [1986], *Determinants of bilateral trade flows*, “Journal of Business”, Vol. 59, Iss. 4, pp. 623–640
15. Stone S. F., Jeon B. N. [1999], *Gravity-model specification for foreign direct investment: A case of the Asia-Pacific economies*, “The Journal of Business and Economic Studies”, Vol. 5, Iss. 1, pp. 33–42
16. UNCTAD [2007], *World Investment Report 2007: Transnational Corporations, Extractive Industries and Development*, New York and Geneva