

THE ECONOMIC INTEGRATION AS A DETERMINANT OF INTRA-INDUSTRY TRADE: THE CASE OF POLAND

Justyna Łapińska

Abstract: *The present study has investigated determinants of intra-industry trade between Poland and its European Union trading partners. The analysis of the factors determining Polish bilateral intra-industry trade employed an econometric model for panel data. This paper is focused on one of the most important factors in the development of this type of exchange, namely on economic integration. The survey results confirm that in the case of Poland, integration with the European Union turned out to be a factor influencing favourably the development of intra-industry turnover. The development of intra-industry trade was also facilitated by the fact that Poland's trade partners use a similar language, which belongs to the group of the Slavic languages as well as by a considerable intensity of trade with EU countries. The negative impact on the development of intra-industry trade was exerted by trade barriers and the degree of the imbalance of trade between Poland and its trading partners. The outcome of the research conducted confirms that the impact of all of the identified determinants of intra-industry trade is consistent with the assumptions of the theory.*

Keywords: *Intra-industry trade, Economic integration, European Union, Poland.*

JEL Classification: *F14, F15.*

Introduction

Trade cooperation between European Union member states is based mainly on the *intra-industry* exchange, which involves the simultaneous export and import of products (semi-finished products, subassemblies and components). These products originate from the same industry and are close substitutes in the sphere of consumption, production, or in both of these areas [13].

The interest in the phenomenon of intra-industry trade was arisen in the early nineteen sixties of the twentieth century, when estimating the effects of the creation of the European Economic Community and the Benelux Union. It turned out that 50% tariff reduction in the area of EEC in 1963, led to the creation of new streams, which primarily took the form of intra-industry trade [1]. The outcome of other empirical studies conducted in the years 1959–1967 was consistent. It revealed that the increase in the trade turnover of goods between the European Economic Community countries concerned mainly (over 70%) intra-industry trade. [13] Similar findings were obtained by analysing the effects of the Benelux Union [26]. Also in that case what was noted was primarily the intensified intra-industry trade.

The identification of the intra-industry trade phenomenon has become the basis for abundant theoretical and empirical analysis, leading to the formation of the intra-industry trade theory, which is nowadays considered to be significant complementation to the traditional theory of international trade.

The objective of this study is to verify the main research hypothesis, according to which economic integration has a significant impact on the intensity of intra-industry turnover in Poland's foreign trade with European Union member states.

1 Economic integration and intra-industry trade – literature review

As follows from the theoretical models, a prerequisite for the emergence of intra-industry trade is the existence of a specific and usually an imperfectly competitive market structure, where the subject of trade are varied products. Significant is also the presence of increasing economies of scale in production. However, it is a number of factors that decides whether intra-industry trade between countries develops, or not. These factors are most frequently divided into two groups. There are macroeconomic factors, *i.e.*, properties (attributes) of the countries participating in the exchange process and microeconomic factors, *i.e.*, characteristics of industries and of products traded.

A crucial factor in the development of intra-industry trade in the macroeconomic dimension are integration processes occurring in the world. Their manifestation is the reduction of restrictions on trade exchange as well as intensification of cooperation. As a result of these integration processes, and more specifically, as a result of the trade policy carried out within the framework of the integration group, two classic effects emerge: trade creation and shift. The first means the emergence of new trade flows between countries liberalizing their trade in goods as a result of the replacement of the existing more expensive domestic production by cheaper imports from the partner country. The other effect – the trade shift is the result of the replacement of imports from third countries with supplies from the countries being members of the integration group. This effect can be achieved when external duties of the countries forming the preferential trade area are at least equal to the differences in production costs between manufacturers producing more expensive goods but originating from member states and cheaper manufacturers from third countries.

Trade liberalization is an extremely important factor in the development of intra-industry turnover and is inseparable from integration processes. Tariff and non-tariff barriers by limiting access to foreign markets affect both intra-industry and inter-industry streams. However, as proved by the theory of intra-trade, strengthening trade protection affects relatively lowering intra-industry turnover to a larger degree than inter-industry turnover. This is so because goods exchanged within intra-industry trade are close substitutes. In consequence, they are characterized by a rather high price elasticity of demand.

The impact of trade liberalization on the intensity of intra-industry turnover is the subject of numerous empirical studies. Many of them confirmed that intra-industry trade becomes more intense along with the reduction of trade protection and the opening up of economies [see also: 12, 20, 21]. Authors of empirical studies use different measures of trade barriers. The nominal level of tariffs is the measure most frequently applied [4, 23]. Veeramani [25] also takes into account the quantitative restrictions on imports. Loertscher and Wolter [16] take the unit composed of the level of tariffs and the distance between the countries as a measure of trade barriers, and Chang [3] simplifies the measurement and introduces a zero-one variable that takes the value 1, if in the trade between the two countries, there are limitations in the form of trade barriers (tariff and non-tariff) and 0 if there are no restrictions.

In empirical research in a situation where it is difficult to estimate the level of trade barriers due to the lack of reliable data, a variable is constructed that describes the so-called

degree of trade orientation, or in other words, the openness of the economy. This variable is the result of estimating the following equation [14]:

$$\log \frac{X_j}{P_j} = \beta_0 + \beta_1 \log \frac{Y_j}{P_j} + \beta_2 \log P_j + \beta_3 \frac{X_j^m}{Y_j} + \varepsilon_j, \quad (1)$$

where:

X_j – the value of exports of the country i

Y_j – the gross domestic product of the country j ,

P_j – the population of the country j ,

X_j^m – the value of exports of mineral resources of the country j ,

ε_j – the random component.

The estimation of the equation (1) allows specifying a hypothetical value of exports *per capita*, which is compared with the actual value. If the difference between the actual and the hypothetical values of exports *per capita* is positive, the implication is that the level of trade barriers is relatively low. And this, in turn, strengthens the development of intra-industry trade.

The impact of economic integration on the development of intra-industry trade can also be analysed as a result of changes that occur in countries in the area of supplying these countries in production factors as well as in the area of changes in prices of these factors as a result of combining the economies [7]. Creating integration groups fosters the equalization of prices of production factors. This phenomenon is clearly visible in the case of a common market whose creation is associated with a free flow of production. The strength of the impact of the mobility of production factors on the size and structure of trade depends primarily on the production factors resources possessed initially by business partners. If the differences in the production factors possessed by countries are significant, then the liberalization of the flow of these factors, in particular of capital, reduces them, which contributes to the intensification of intra-industry turnover. In this context the impact of integration processes on the development of various forms of intra-industry trade (horizontal and vertical)⁷ appears to be interesting.

If we assume that the quality of specific types of differentiated goods depends on the amount of capital employed in the production process, then liberalization of trade means that countries that are more abundant in capital specialise in manufacturing and exporting more capital-intensive types of goods and at the same time of higher quality. Meanwhile, countries better equipped in labour provide the variety of goods of lower quality and relatively time-consuming. Therefore, what develops is the intra-industry trade in vertically differentiated products. The volume of this trade decreases along with the equalization of income of the societies of the trading countries. More advanced forms of regional economic integration (*e.g.*, a common market), lead to quicker levelling of prices of production factors. In consequence, real wages in countries that specialize in labour-intensive production rise, which denotes the equalization of income of inhabitants of the trading countries. As a result, the structure of intra-industry trade gets modified and the exchange of horizontally differentiated products (*i.e.*, ones that are similar in terms of quality) grows in importance.

⁷The main criterion for the division of intra-industry trade into horizontal and vertical is the way of differentiating tradable commodities. When traded products are similar in quality but differ in other features, often referred to as visible (*e.g.*, colour, shape), or ones that can be sensed (*e.g.*, taste, smell), then we can talk about the horizontal trade. If the exchanged goods vary in quality, then it is the vertical type of intra-industry trade.

The impact of economic integration processes on increasing the intensity of intra-industry trade has been the subject of numerous empirical studies. The earliest analyses focused primarily on the calculation of the size of changes in the intra-industry trade volume in different time periods. Also, the intra-industry trade volume realised within the group and in the exchange with third countries was being compared [see, for instance: 1, 8, 13]. In later works usually econometric models were being constructed to attempt to quantify the impact of the factors related to integration processes on the intensity of intra-industry trade volume. Most frequently a binary variable was introduced. The variable takes the value 1, if the trading countries belong to the same integration group, and 0 if they do not [see: 3, 18, 24]. The importance of integration processes in enhancing the intensity of intra-industry trade is confirmed by numerous empirical studies [see, for instance: 9, 10, 22, 27].

The subject literature [see, for instance: 6, 15, 17] also mentions other factors promoting the development of intra-industry trade. These are significant intensity of commercial links between the countries (usually measured by the share of trade of a particular partner in the total foreign trade of the country) and a large share of processed goods in the trade exchange of a pair of countries. The degree of the intensity of trade is also significantly impacted by the geographical proximity of the trading partners. Due to the possibility of reducing transport costs, it is a factor contributing to the development of both intra-industry trade and inter-industry trade.

It seems, however, that the geographical proximity (distance) has a stronger influence on the intensity of intra-industry trade than on the intensity of inter-industry trade. The differentiated products are characterized by a high price elasticity of demand, and, therefore, respond to changes in costs and prices relatively more than goods exchanged within inter-industry trade. A factor supporting the development of intra-industry trade is also the cultural community of partners, and in particular their common language. Cultural ties, mainly due to the low barriers to conducting marketing activities on foreign markets (a common language facilitates communication), facilitate significantly exchange within intra-industry trade.

2 Materials and methods

In order to identify the factors determining Poland's intra-industry trade with EU member states an econometric model for panel data was constructed. The values of the Grubel-Lloyd index [13] were taken for the dependent variable and were calculated according to the following formula:

$$IIT = \frac{\sum_{i=1}^n (x_i + m_i) - \sum_{i=1}^n |x_i - m_i|}{\sum_{i=1}^n (x_i + m_i)}, \quad (2)$$

where:

x_i – the value of exports of the industry i ,
 m_i – the value of imports of the industry i .

Bilateral intra-industry trade indices were calculated for Poland's trade with individual countries of the European Union in the years 2002–2011, and for the three-digit product groups they were categorized according to the Standard International Trade Classification.

The dependent variable IIT is an index taking on values from the interval [0; 1]. The higher the value, the greater the share of intra-industry trade in trade volume. A logit

transformation of the dependent variable was performed. In that way we obtained a dependent variable in the form of the $\ln(IIT/1-IIT)$, and this dependent variable's values are contained in the interval $(-\infty; \infty)$. This eliminated the possibility of obtaining theoretical values of the Grubel-Lloyd index beyond the acceptable interval $[0; 1]$.

The set of explanatory variables included two dummy variables (*EU* and *LANG*). One of them describes EU membership, the other expresses the cultural ties which are expressed by the fact that Poland's trade partners use as their main language a language belonging to the Slavic languages. Also, the impact of the intensity of trade between Poland and its trading partners on the development of intra-trade volume (the variable *TI*) was examined as well as the influence of the degree of the imbalance of bilateral trade flows (the variable *TIMB*). The impact of the trade barriers (the variable *ATR*) and the geographical distance between Poland and its trading partners (the variable *DIST*) were taken into account, too. All independent variables apart from the binary one were logarithmised.

The study covered 26 of Poland's trade partners who were member states of the European Union in 2011.

3 Theoretical Hypotheses

The following main research hypothesis and additional hypotheses concerning the intensity of intra-industry trade between Poland and European Union member states were subject to verification:

The main research hypothesis:

H1: Poland's membership in the European Union significantly increases the intensity of intra-industry trade exchange between Poland and EU countries.

Additional hypotheses:

H2: The trade barriers that exist in the trade relations between Poland and its trading partners significantly weaken the intensity of intra-industry trade.

H3: Intensive trade relations with trading partners measured by the participation of a particular country in Poland's total trade volume impact significantly the increase in mutual intra-industry trade.

H4: A similar language, which is an official language in the countries that trade with Poland, belonging to the group of Slavic languages, significantly increases the intensity of mutual intra-industry trade.

H5: There is a negative correlation between the geographical distance between Poland and its trading partners and the intensity of their mutual intra-industry trade.

H6: The degree of trade imbalance between trading partners weakens the intensity of their mutual intra-industry trade.

4 Model Estimation

The theoretical hypotheses allowed the model specification for panel data to be obtained:

$$IIT_{jt} = \alpha_0 + \alpha_1 UE_{jt} + \alpha_2 ATR_{jt} + \alpha_3 TI_{jt} + \alpha_4 LANG_j + \alpha_5 DIST_j + \alpha_6 TIMB_{jt} + v_{jt} \quad (3)$$

$$v_{jt} = e_t + u_j + \varepsilon_{jt}, \quad (4)$$

The description of the variables and the sources of data used are shown in Table 1.

Tab. 1: Variables used in empirical investigation

Variables	Variables description
IIT_{jt}	The intensity of intra-industry trade between Poland and the country j , in the time period t , measured by the Grubel-Lloyd index. Data source: [5].
ATR_{jt}	The size of the trade barriers which occurred in the trade exchange with the trading partner j in the year t . The measure of the trade barriers is the average tariff rate used by the countries being Poland's trade partners. Data source: [28].
EU_{jt}	The dummy variable takes on the value 1, if in the year t , Poland and its trading partner j were European Union member states, and takes the value 0, if the two countries, or one of them, did not belong to the European Union.
$TIMB_{jt}$	The degree of trade imbalance of trade exchange between Poland and the country j , in the year t . The variable was designated as the share of the trade balance with the partner j in total turnover. Data source: [5].
TI_{jt}	The share of the country j in Poland's total trade turnover, in the year t . Data source: [5].
$LANG_j$	The dummy variable takes on the value 1, when the language of Poland's trading partner belongs to the group of the Slavic languages, and equals 0, when it does not belong to the group of the Slavic languages.
$DIST_j$	The geographical distance between the capitals of Poland and its trading partner j . Data source: [11].
v_{jt}	The random error in the object j , in the time period t , which consists of the following components: e_t – impulses affecting all observations in the time period t , u_j – impulses affecting all the observations in the object j , ε_{jt} – impulses affecting only observations in the object j , in the time period t .

Source: elaborated by the author.

5 Results and Discussion

The estimation of the panel data model, designated with formula (3) was made with the use of the *Gretl (GNU Regression Econometrics Time-Series Library)* software. There were no *a priori* assumptions made for the occurrence and significance of individual effects, as well as for the character of the individual effects (fixed or random). The choice of the

estimation methods (*pooled OLS, fixed effects, random effects*) was made with the use of a decision procedure [see, for instance: 2, 19] from the field of econometrics advocated in the literature. The model was estimated with the use of a classical least squares method and diagnostic tests were performed and as a result the following values of the test statistics were obtained: the *Wald* test ($F=6.667$; $p\text{-value}<0.00001$) the *Breusch-Pagan* test ($LM=80.872$; $p\text{-value}<0.00001$) and the *Hausman* test ($H=30.4$; $p\text{-value}<0.00001$).

Based on the diagnostic tests conducted, it was found that a suitable model to study the impact of the macroeconomic determinants of the intensity of intra-industry trade is the fixed effects model (*FE*). Therefore, the parameters of the fixed effects model were estimated. However, the phenomenon of heteroscedasticity occurred, that is the non-homogeneity of the random components variance within the sample. Heteroscedasticity affects inappropriate estimations of standard errors for individual parameters and the revaluation of the determination coefficient, which may distort the conclusions regarding the significance of variables. Therefore, to estimate the parameters ultimately, the weighted least-squares method was applied (*WLS*).

Statistical values of significant parameters of the model described by formula (3) are shown in Table 2.

Tab. 2: The results of the estimation of the model describing Poland's intra-industry trade with EU countries

Dependent variable $\ln(IIT_{jt}/1-IIT_{jt})$					
Independent variables	Coefficient	Std. Error	<i>t</i> -ratio	<i>p</i> -value	Significance ^{a)}
Constant	0,4885	0,0961	5,081	<0,00001	***
$TIMB_{jt}$	-0,0553	0,0115	-4,825	<0,00001	***
TI_{jt}	0,2695	0,0139	19,390	<0,00001	***
ATR_{jt}	-0,3626	0,0881	-4,118	<0,00001	***
$LANG_j$	0,3032	0,0498	6,093	<0,00001	***
UE_{jt}	0,1212	0,0378	3,209	0,0015	***
Observations	260				
Standard error of residuals	0,948316				
R^2	0,731620				
Adjusted R^2	0,726337				
F (5, 254) = 138,4837	<i>p</i> -value for test F <0,00001				

^{a)}*** The statistically significant variable at the level of 1%.

Source: the author's own calculations.

The model is statistically correct. Five out of the six potential explanatory variables proved to be significant. In the model all of the obtained signs for the parameter estimates for a particular explanatory variable are consistent with the predictions of the theory.

When interpreting the results obtained in relation to the variables that were previously logarithmised, the following interpretation method can be used: the increase in the explanatory variable by 1%, causes *ceteris paribus* an increase or decrease (depending on the sign of the parameter) in the dependent variable of $\alpha\%$ (the parameter for a specific explanatory variable). In this case, the dependent variable is the logit, which means that the relation $IIT_{jt}/1-IIT_{jt}$ changes by $\alpha\%$, which is the relation of intra-industry trade (IIT_{jt}) and inter-industry trade ($1-IIT_{jt}$).

The results of the research confirm that the factor that significantly and also negatively affected the development of the indicators of Poland's intra-industry trade were trade barriers. However, the impact of this factor was not considerable. The resulting value of the parameter α for the variable ATR_{jt} was -0.36 . It shows that the average increase in the average tariff rate of Poland's partner countries in trade by 1%, results in the decrease in the relation $IIT_{jt}/1-IIT_{jt}$ (the relation of intra-industry trade to inter-industry trade) of 0.4%. The research hypothesis H2 was verified positively.

The intensity of trade between Poland and its trading partners (the variable TI_{jt}) proved to be a statistically significant factor. The intensity of trade was expressed by the share of individual trading partners in Poland's total trade volume. This factor has a positive effect on the development of intra-industry trade, but the strength of the impact is even smaller, as indicated by the parameter α for the variable TI_{jt} , which is 0.27. The research hypothesis H3 was verified positively.

The factor that significantly but also adversely affects the intensity of intra-industry trade is the degree of trade imbalance between Poland and EU countries. The parameter α for the variable $TIMB_{jt}$ was -0.06 . Therefore, the research hypothesis H6 was verified positively.

The estimated model had two dummy variables that were statistically significant. One of them (EU_{jt}) is related to Poland's and its trading partners' membership in the European Union. The second variable ($LANG_j$) describes the cultural ties of trading partners expressed by the fact that a trading partner's language belongs to the group of Slavic languages. In the case of the binary variables UE_{jt} and $LANG_j$, on the basis of the evaluation of the parameter sign for a particular explanatory variable, one can determine the direction of the impact of this variable on the dependent variable. The results obtained indicate a positive relationship between trading partners belonging to the European Union and the intensity of intra-industry trade between them. Positive relationship also occurs when the population of the country being Poland's trading partner speaks a language (the main language) that belongs to the group of Slavic languages. The results are consistent with the predictions of the theory and allow the research hypotheses H1 and H4 to be verified positively.

The variables $DIST_{jt}$ proved not to be statistically significant. Therefore it was not possible to verify the research hypothesis H5 concerning the impact of the geographical distance between Poland and its EU partners on the intensity of intra-industry trade.

Conclusion

Intra-industry trade that consists in simultaneous importing and exporting similar products belonging to the same branch plays an increasingly important role in Poland's trade with European Union member states. This type of exchange is conditioned by numerous and various factors.

The economic integration of the countries plays a particularly important role. Integration groups set the direction and forms of cooperation that serve to strengthen the ties between the member states. The strengthening of internal cooperation is also manifested through the intensification of mutual trade. Empirical studies hitherto have shown that under conditions of imperfect competition and product differentiation integration processes contribute to the intensification of primarily intra-industry trade.

As follows from the analyses conducted in this study, in the case of Poland, European integration has proved to be a factor contributing to the development of intra-industry trade. The factors that are significant and exert a positive impact include the intensity of trade

between Poland and its trading partners, the cultural ties expressed by the fact that a trading partner's language belongs to the group of Slavic language. However, the trade barriers and the degree of and the trade imbalance in Poland's bilateral trade volume had a negative impact on the development of intra-industry trade. The direction of the impact of all factors that determine the Poland's intra-industry trade with EU countries was consistent with the assumptions of the theory.

References

- [1] BALASSA, B. Tariff Reductions and Trade in Manufactures Among the Industrial Countries. *In The American Economic Review*, 1966, Vol. 56, pp. 466-473. ISSN 0002-8282.
- [2] BALTAGI, B. H. *Econometric Analysis of Panel Data*. Chichester: John Wiley & Sons Ltd, 2001. 293 p. ISBN 0-471-49937-4.
- [3] CHANG, S.-C. Horizontal and Vertical Intra-industry Trade and Firm's Investment Strategies: Evidence from the IT Industry in the Asian, EU and US Markets. *In Global Economic Review*, 2009, Vol. 38, Iss. 1, pp. 63-76. ISSN 1226-508X.
- [4] CLARK, D. P. Recent Evidence on Determinants of Intra-Industry Trade, *In Weltwirtschaftliches Archiv*, 1993, Vol. 129, Iss. 2, pp. 332-344. ISSN 0043-2636.
- [5] COMTRADE, *United Nations Commodity Trade Statistics Database*. [cit. 2013-07-12]. Available from WWW: <<http://comtrade.un.org/db/>>.
- [6] CZARNY, E. *Teoria i praktyka handlu wewnątrzgałęziowego*. Oficyna Wydawnicza Szkoły Głównej Handlowej, 2002. 242 p. ISBN 83-7225-137-1.
- [7] CZARNY, E., ŚLEDZIEWSKA, K. *Polska w handlu światowym*. Polskie Wydawnictwo Ekonomiczne, 2009, 272 p. ISBN 978-83-208-1837-6.
- [8] DRABEK, Z., GREENAWAY, D. Economic Integration and Intra-Industry Trade: The EEC and CMEA Compared. *In Kyklos*, 1984, Vol. 37, pp. 444-469. ISSN 0023-5962.
- [9] EKANAYAKE, E. M. Determinants of Intra-Industry Trade: The Case of Mexico, *In The International Trade Journal*, 2001, Vol. 15, Iss. 1, pp. 89-112. ISSN 0885-3908.
- [10] FOSTER, N., STEHRER, R. Preferential Trade Agreements and the Structure of International Trade. *In Review of World Economics*, 2011, Vol. 147, Iss. 3, pp. 385-409. ISSN 1610-2878.
- [11] *GeoDist Database*. Centre D'Etudes Prospectives et D'Informations Internationales, 2013. [cit. 2014-04-27]. Available from WWW: <http://www.cepii.fr/CEPII/en/bdd_modele/bdd.asp>.
- [12] GLOBERMAN, S., DEAN, J. W. Recent Trends in Intra-Industry Trade and Their Implications for Future Trade Liberalization. *In Weltwirtschaftliches Archiv*, 1990, Vol. 126, Iss. 1, pp. 25-49. ISSN 0043-2636.
- [13] GRUBEL, H. G., LLOYD, P. J. *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products*. Macmillan, 1975. 205 p. ISBN 0-333-17624-3.

- [14] HAVRYLYSHYN, O., KUNZEL, P. Intra-Industry Trade of Arab Countries: An Indicator of Potential Competitiveness. *IMF Working Paper*, 1997, No. 97/47 [cit. 2014-04-09]. Available from WWW: <<http://www.imf.org/external/pubs/ft/wp/wp9747.pdf>>.
- [15] LLOYD, P. J., LEE H. - H. *Frontiers of Research in Intra-Industry Trade*. Macmillan, 2002. 320 p. ISBN 978-0333971260.
- [16] LOERTSCHER, R., WOLTER, F. Determinants of intra-industry trade: Among countries and across industries. In *Weltwirtschaftliches Archiv*, 1980, Vol. 116, Iss. 2, pp. 280-293. ISSN 0043-2636.
- [17] ŁAPIŃSKA, J. Czynniki decydujące o intensywności handlu wewnątrzgałęziowego. In GIERCZAK, A.; WIAŻEWICZ, J.; ZIELIŃSKA, A. *Otoczenie współczesnych przedsiębiorstw – specyfika i zmiany*, Oficyna Wydawnicza Politechniki Rzeszowskiej, 2012, pp. 163–170. ISBN 978-83-7199-730-3.
- [18] MONTOUT, S., MUCCHIELLI, J. - L., ZIGNAGO, S. Regionalization and intra-industry trade. An analysis of automobile industry trade in NAFTA. In *Revue Région et Développement*, 2002, Vol. 16, pp. 137-159. ISSN 1267-5059.
- [19] OSIŃSKA, M. (ed.), *Ekonometria współczesna*. Wydawnictwo „Dom Organizatora“, 2007. 452 p. ISBN 978-83-7285-321-9.
- [20] SHARMA, K. Horizontal and vertical intra-industry trade in Australian manufacturing: does trade liberalization have any impact? In *Applied Economics*, 2004, Vol. 36, pp. 1723-1730. ISSN 1466-4283.
- [21] TEWELDEMEDHIN, M. Y., SCHALKWYK, H. D. The international trade prospective of agriculture sector in South African. In *Journal of Development and Agricultural Economics*, 2010, Vol. 2(8), pp. 281-292. ISSN 2006-9774.
- [22] THORPE, M., ZHANG, Z. Study of the Measurement and Determinants of Intra-Industry Trade in East Asia. In *Asian Economic Journal*, 2005, Vol. 19, Iss. 2, pp. 231-247. ISSN 1467-8381.
- [23] TOH, K. A Cross-Section Analysis of Intra-Industry Trade in U.S. Manufacturing Industries. In *Weltwirtschaftliches Archiv*, 1982, Vol. 118, Iss. 2, pp. 281-301. ISSN 0043-2636.
- [24] TURMO, J., HERVITZ, H. M., MOSLARES, C. An Analysis of the Determinants of Intra-Industry Trade: The Case of Spanish Foreign Trade. In *International Business & Economic Research Journal*, 2005, Vol. 4, Iss. 3, pp. 53-62. ISSN 1535-0754.
- [25] VEERAMANI, C. Trade barriers, multinational involvement and intra-industry trade: panel data evidence from India. In *Applied Economics*, 2009, Vol. 41, pp. 2541-2553, ISSN 1466-4283.
- [26] VERDOORN, P. J. *The Intra-Block Trade of Benelux* In. ROBINSON, E. A. G. (ed.) *Economic Consequences of the Size of Nations*. Macmillan, 1960, pp. 291-329.
- [27] WAKASUGI, R. Vertical Intra-Industry Trade and Economic Integration in East Asia. In *Asian Economic Papers*, 2007, Vol. 6, Iss. 1, s. 26-39. ISSN 1535-3516.
- [28] *World Development Indicators*, The World Bank, 2013, [cit. 2014-05-04]. Available from WWW: <<http://data.worldbank.org/data-catalog/world-development-indicators>>.

Contact Address

Dr Justyna Łapińska
Nicolaus Copernicus University in Toruń
Gagarina 13A, 87-100 Toruń, Poland
Email: justlap@umk.pl
Phone number: +48 566 114 882

Received: 01. 01. 2015

Reviewed: 11. 03. 2015, 12. 03. 2015

Approved for publication: 08. 04. 2015