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Is Intra-Industry Trade Specialization a Precondition to Business Cycle Synchronization When Joining the Euro Area? The Case of Poland

Abstract

The first objective of this paper is to present theoretical approaches to the impact of trade growth (induced by monetary integration) on business cycle synchronization which is an important factor of a country's readiness for a currency union accession. The main conclusion from the first part of the analysis is that business cycle convergence and the cost of the lack of an autonomous monetary policy depend on intra-industry trade (IIT) intensity rather than on general trade growth. The second objective is to assess – using the IIT index as a measure of business cycle synchronization (and of susceptibility to asymmetric shocks transmitted mostly through trade channels) – preparedness of the Polish economy to the euro adoption. Calculations reveal that the IIT intensity in Poland is already relatively high (in particular in relations with the euro area members) and continues to rise. This confirms the increasing complementarity of Poland's economy with the economic structures of the euro area partners which reduces the probability of asymmetric shocks.

Keywords: intra-industry trade, optimum currency area, trade specialization, EU-10 countries, euro area **JEL**: F11, F12; F15, F44

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Introduction

In recent years the links between trade integration and business cycle synchronization have become an important area of discussions in the context of the euro area (in) stability and in the context of the applicant countries' commitments to join this area. There is a common understanding in theory that countries with high intensity of foreign trade and positively correlated business cycles are more likely to join and benefit from a monetary union [Frankel, Rose, 1996; Czarny et al., 2013]. There is no consensus, however, on whether the increased trade intensity fostered by the creation of a currency union leads to more or less synchronization of trading countries' business cycles.

The objective of this paper is to explore the impact of economic integration (trade specialization) on the synchronization of business cycles and to draw conclusions for Poland.

The analysis includes theoretical and statistical parts. The objective of the first part is to present the existing theoretical approaches to the impact of trade growth (induced by monetary integration) on business cycles synchronization. The main conclusion is that a growth in trade results in greater business cycle convergence only in the case of intraindustry trade (IIT) which leads to an increase in the complementarity of countries' economic structures. The statistical part contains calculations of IIT intensity in Poland's foreign trade in the period of 1995–2014, i.e. years covered by the research grant, which became the basis for preparing this paper. The main conclusion is that a high and increasing share of IIT in the country's trade with the euro area members suggests sustainability of Poland's business cycle synchronization with the euro area and the complementarity of the Polish economy with the economic structures of the euro area partners.

The paper is structured as follows. It briefly summarizes the theoretical framework of relations between trade specialization and business cycle synchronization, discusses changes in the intensity of IIT between Poland and its trading partners and finally it concludes.

Theoretical Framework

Trade specialization and related susceptibility to asymmetric shocks (transmitted mostly through trade channels) is one of the most debated issues in the theory of monetary integration. According to the concept of an optimum currency area (OCA) as formulated in 1961 by R. Mundell and later developed by his successors, the synchronization of business cycles is one of the most important criteria for the creation of a currency union suitability [Mundell, 1961]. Countries that enter a currency union are likely to experience different business cycles as compared to the previous periods, partly because of changes in monetary policy (implementation of a new, single currency), partly as a result of closer trade links with the other members of the union. If business cycles in the countries

forming/participating in a monetary union are not convergent enough, the single monetary policy of the union will not be optimal for each country concerned. Thus, the losing of a country's own currency (monetary independence) and 'foregoing the possibility of dampening business cycle fluctuations through independent counter-cyclic monetary policy' [Frankel, Rose, 1996] brings costs for the monetary union members². Countries give up a potentially important stabilizing tool when they decide to join a currency union. The greater the chance of asymmetric shocks is, the higher the cost will be.

As already mentioned, there is no consensus in theory on whether the increased trade intensity fostered by the creation of a currency union leads to more or less synchronization of trading partners' business cycles. Therefore, there is no uniform approach on the impact of increased trade in the currency union on the potential for asymmetric shocks and suitability of monetary integration [Frankel, Rose, 1996].

Historically, two opposing views appeared on the possible outcome of deepening economic integration, in particular trade integration, which are known as 'the European Commission's View' and 'the Krugman's View'³ [Handler, 2013; Blanes-Cristóbal, 2009]. a) The Commission's view [Commission of the European Communities, 1990] was based on Kenen's [1969] idea that strongly diversified economies, with a high share of IIT, are less susceptible to asymmetric shocks [Kenen, 1969]⁴. It assumed that deeper integration in the form of Economic and Monetary Union (EMU) will lead to a situation where asymmetric shocks occur less frequently (this approach is also referred to as the convergence approach). The explanation is a big role of intra-industry trade between the EMU member states. The more integrated the countries are, the more similar their reaction to distortions is. As a result, their business cycles will also become more symmetric (any changes in the pattern of demand in individual industries will be more similar), [Böwer, Guillemineau, 2006]. Also, monetary integration will be easier (less costly) for participating (and applicant) countries as adjustments to changes ongoing in the economy will appear in the same industries and not between them [Faustino, Leitão, 2009].

The Commission's assumption that increased trade in the EMU would be mostly of IIT, and not of inter-industry character, partly reflected the previous experience with the European Economic Community (EEC) integration. Researchers who analyzed liberalization results among the member countries of the EEC and other integration blocs in the 1960 s and in the next decades found that the resulting trade increase was mostly due to intra-industry trade [Balassa, 1966; Fontagné, Freudenberg, 1997].

This finding also contributed to the theoretical research as it contradicted the traditional Heckscher–Ohlin theory which explained the sources of trade growth in comparative costs and advantages based on different factor endowments. New theoretical models appeared in the late 1970 s and the early 1980 s and stressed other determinants of intraindustry trade like, among others, increasing returns of scale and consumer preferences in conditions of imperfect competition [Czarny, 2002]. Moreover, additional sources of trade advantages were pointed out i.e., reduction in trade transaction costs and costs related to the volatility of exchange rates. According to the theory, this would benefit trade in differentiated products (which is the essence of IIT) more than trade in homogeneous products (typical for inter-industry trade).

b) The opponents of this view were represented by Krugman [Krugman, 1991; Eichengreen, 1992, pp. 138–161]. He argued that the EMU would increase the divergence of business cycles, which would result in more inter-industry trade in Europe (a rise in trade specialization), rather than an increase in intra-industry trade. Thus, the EMU would result in the countries becoming more specialized in the goods in which they have comparative advantages. He cited the example of the USA and argued that in Europe, as in the USA, closer integration will result in the increased regional concentration of industries (in order to profit from economies of scale). Thus, the economic structures of the currency union members will become increasingly different. Krugman's conclusion was that the potential for asymmetric shocks increases with greater integration among countries (and regions).

De Grauwe [2014, pp. 23–27] added one more argument against Krugman's approach. He noticed that since economies of scale did not matter much to services, economic integration did not lead to regional concentration of services as might be the case with industrial sectors. As a result, 'the trend towards regional concentration of economic activities may stop even if economic integration moves forward'. In particular, high-technology industries, financial services, also the chemical and automotive industries illustrate well this thesis.

On the other hand, Bąk and Maciejewski [2015] stress that 'eliminating law and economic barriers between regions boosts trade and likely fosters specialization, i.e. divergence of economic structures'. Thus, in some cases, economic integration will lead to higher concentration in fewer regions and deeper specialization of production, instead of convergence of economic structures and incomes.

In turn, the argument of positive effects of the EMU (of trade growth resulting from monetary integration) on business cycle synchronization was strengthened by the concept of endogeneity of the optimum currency area (OCA)⁵, partly already incorporated by the Commission in its 1990 report [Commission of the European Communities, 1990]. The concept of endogeneity of OCA was formally formulated by Frankel and Rose [1996, 1997]. The authors presented the argument that a common currency area might gradually become an optimal currency area, despite not having been an optimum currency area (OCA) prior to currency unification: 'countries which join the EMU, no matter what their motivation, may satisfy OCA criteria *ex post* even if they do not *ex ante!*' [Frankel, Rose, 1997]. Thus, they argued, the convergence tendencies reinforce after monetary unification.' OCA assessment criteria need not be met prior to a monetary union's creation, since endogeneity will lead to the fulfilment of these criteria at some point in time after monetary unification'. This was the optimistic conclusion that the monetary union would endogenously create the conditions of its success [Fontagné, Freudenberg, 1999]⁶. At the same time, currency unification should bring increased intra-industry trade and greater

business cycle synchronization among member states⁷. According to that theory, the degree of intra-industry linkages is of key importance to the sustainability of business cycle synchronization [Borowski, 2001]. Therefore, it is crucial also to the costs of adjustment of an applicant country to a monetary union as well as of a member of such a union: the higher the IIT share in total trade of a country, the lower the cost of the lack of an autonomous monetary policy in the case of an asymmetric shock [Dautovic et al., 2014; Misztal, 2013].

Let us notice that the original Mundell's OCA approach considered business cycle similarity to be exogenous to monetary policy. In his approach, the synchronization of business cycles was treated as a necessary (or desired) precondition of a successful monetary union. In contrast, the endogenous OCA approach stresses the possibility of achieving this criterion after the creation of monetary union.

Taking into account the lack of consensus in the theory as to the impact of trade increase on the business cycle (whether the likelihood of the cycle synchronization increases or decreases), the relationship between the two issues can be addressed in an empirical way. On account of the limited length of the article, an overview of the literature on this issue is not included⁸. Let us only add that, as in the case of theoretical conclusions, the existing empirical evidence on association between trade flows and business cycle synchronization is mixed [Baldwin et al., 2005; Blanes-Cristóbal, 2009].

Changes in the Intensity of IIT Between Poland and the Euro Area Members

As already mentioned, the nature of commodity specialization of the countries forming a monetary union as measured by the IIT index is a useful indicator for assessing the sustainability of business cycle convergence between countries [Borowski, 2001]. Thus, we adopt below this index to assess the risk of asymmetric shocks between Poland and the euro area. We assume that the stronger Poland's intra-industry linkages are, the lower the risk of asymmetric shocks which may affect the Polish economy after joining the euro area and of giving up the national currency as an instrument of mitigating the effects of such shocks are.

Intra-industry trade (IIT, also referred to as two-way trade) shows the extent to which simultaneous exports and imports of products belonging to the same industry occur. The calculations of IIT intensity in this paper are based on the standard Grubel–Lloyd index [Grubel, Lloyd, 1975, pp. 21–36] which allows one to compute the share of two-way trade in the total trade in an industry⁹. The main period under analysis is 1999–2014 (i.e., from the beginning of the third stage of the EMU when the conversion rates of the national currencies against the euro became fixed to the last year for which comparable trade data are available). We also present data for the reference period, i.e. 1995–1998,

for the purpose of illustrating the scale of change. In this period, the implementation of the EMU was already in progress.

The data presented in Figure 1 allow for the following observations. Throughout the period covered, the Grubel–Lloyd index showed a steady upward trend in relations with all the groups of partners. This trend reflected ongoing structural changes in the economy as a whole, leading to a more advantageous specialization in trade and production than that offered by inter-industry trade.

The Grubel–Lloyd index was the highest in trade with the euro area countries throughout the period in question. Whereas in 1999 (the beginning of the creation of the EMU) it was only slightly (4 pps) higher than in trade with the other EU Member States, in 2014 the gap was over 8 pps i.e., it had more than doubled. Therefore, the thesis on the stimulating effect of economic integration on the development of intra-industry trade is corroborated in the case of Poland. At the same time, IIT indices of Poland's trade confirm that the country has managed to modify its production pattern from complementary to competitive and moved towards products based on high quality and high value added, thereby accelerating convergence towards the more developed (mostly) euro area members. Thus, the Polish production and trade structures have become more similar to those of the core EU Member States.



FIGURE 1. Intra-industry trade indices in Polish foreign trade (in %)

Notes: The euro area countries: Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal (since 1999), Greece (since 2001), Slovenia (since 2007), Cyprus and Malta (since 2008), Slovakia (since 2009), Estonia (since 2011), Latvia (since 2014).

'Non-EU' stands for countries other than the EU Member States (including Croatia).

Source: calculations and figure were made by Łukasz Ambroziak, Ph.D., a member of the research team, on the basis of the Comtrade database.

It must be also added that the increase in the intra-industry trade intensity index was even faster in trade with the non-EU countries (more than twofold in 1999–2014). However, it was mostly due to its much lower level at the beginning of the covered period (a mere 6.3% in 1999). As a result, in 2014 the index exceeding 14% in Poland's trade with the non-EU countries still accounted for less than one-third of the figure for trade with the euro area members.

The economic and financial crisis only temporarily weakened the strength of intraindustry trade links (its adverse effect materialized in trade with the euro area solely in 2009 and it lasted one year longer in trade with the non-euro area EU Member States). It suggests that IIT is rather resilient to cyclical fluctuations [Molendowski, Polan, 2013].

The theory does not offer any suggestion as to what level of IIT intensity is 'optimal' in order to be considered a condition of sustainable convergence of business cycles in the countries forming a common currency area. The trend of IIT changes seems more important than the level of IIT intensity. Figure 1 reveals that this is an unambiguously upward trend, even if slow. It confirms the increasing convergence of Poland's business cycle with that in the euro area.

FIGURE 2. IIT indices in Poland's trade with specific euro area countries and with the EU Member States outside the euro area in 2014 (in %)



Source: calculations and figure were made by Łukasz Ambroziak, Ph.D., a member of the research team, on the basis of the Comtrade database.

The above general data are also confirmed by trade with the selected individual EU Member States. Poland's highest IIT index (53% of the total trade) was noted in relations with Germany – Figure 2. It is a positive phenomenon, especially given that Germany is Poland's largest trading partner in the EU (25% of trade in 2014)¹⁰ and ranks among the EU's most advanced economies. High business cycle synchronization with the partner should mitigate adverse effects of a possible demand shock, although it obviously does not eliminate them. The countries which ranked next were France and the Czech Republic - in both cases intra-industry trade accounted for 45% of the total trade with the partner in question. Let us note that one of them was a euro-area country, whereas the other was not. Those were followed by Italy and Hungary - with an index of 42% each11. Also in this case their positions with regard to the euro area were different. The high indices of IIT with the Czech Republic and Hungary and, to a lower degree, also with the other EU Member States outside the euro area reflect the historically developed and strong trade links with those economically advanced partners as well as links among affiliates of multinational corporations operating in Poland and the above mentioned countries. Therefore, in accordance with the theoretical indications, Poland's IIT indices were generally the highest in regard with the most developed EU Member States.

Conclusions

The main conclusion from the theoretical part is that a growth in trade results in greater business cycle convergence only in the case of intra-industry trade (IIT). The reason behind is that only this type of trade allows for an increase in the complementarity of countries' economic structures and makes asymmetric economic shocks less probable.

This general conclusion drawn from the examination of the theoretical literature has been fully justified for Poland by the empirical research. Calculations have revealed that IIT intensity is already rather high in Poland, particularly in trade with the euro area countries. The high index of IIT reflects the increasing similarity of Poland's business cycle synchronization with the euro area and the complementarity of the Polish economy with the economic structures of the euro area partners. Such a situation reduces the risk of asymmetric shocks and means that Poland is on the path to convergence with the euro area countries. Drawing on Fidrmuc [2006], we can formulate a similar conclusion more cautiously: the business cycle correlation in Poland 'is sufficiently high as not to hinder membership in the monetary union'. Moreover, Fidrmuc argues that 'several current members of the euro area appear to have lower business cycle correlations than the new EU members'.

We must stress, however, that the steadily increasing and relatively high IIT intensity in Poland suggests it has satisfied one, but only one, of the important criteria of successful participation in a monetary union i.e., business cycle correlation. There are also other conditions that must be fulfilled by a country interested in joining a common currency area. One of them is the political will to adopt the common currency.

Notes

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² Adverse effects can be mitigated by high mobility of production factors, particularly by high mobility of labor and a system of financial transfers.

³ De Grauwe [1997] was the first to use the names: the Commission's and Krugman's approaches.

⁴ In a broader sense, the Commission's approach directly referred to the report of the 'monetarist' point of view [Commission of the European Communities, 1990] which suggested that real convergence would be achieved after monetary unification. This approach was later characterized by the endogeneity effect of currency unions [Frankel, Rose, 1996]. The monetarists' approach was in opposition to the so-called economists' point of view, which was supported mostly by German researchers. They stressed the necessity of harmonization of economic policies prior to monetary integration [Bąk, Maciejewski, 2015].

⁵ The endogeneity of currency areas became part of the 'new' OCA theory; to compare the traditional OCA and new OCA theories see: Handler [2013].

⁶ Let us add that according to some specialists, 'The most recent literature and analyses presented in this paper suggest that the endogeneity effect in the EMU has been frail since its onset' [Bąk, Maciejewski, 2015].

⁷ The OCA index was proposed by Bayoumi and Eichengreen [1997] to assess also the endogeneity of OCA conditions.

⁸ The best-known publication is probably the seminal paper by Frankel and Rose [1996] in which they pointed out and empirically tested that 'closer international trade links result in more closely correlated business cycles across countries' See: Blanes-Cristóbal [2009] and the review of the literature on the impact of the EMU on trade changes by Baldwin et al. [2005].

⁹ This index is based on bilateral trade flows at the 4-digit level of HS classification (referred to as an industry). Next, bilateral indices for individual countries were aggregated into total trade indices (across industries and by group of partner countries). The Grubel–Lloyd index takes on a minimum value of zero when there are no products in the same industry that are simultaneously imported and exported and a maximum value of 1 (or 100%) when all trade is intra-industry (see more: Ambroziak [2012]).

¹⁰ An important explanation of high share of Germany in Poland's IIT trade is also the high involvement of Polish companies in vertical specialization (composed mostly of an exchange of final and intermediate goods produced in the same industry). The latter fact is related to global value chains managed by transnational corporations whose role in the world economy has been growing rapidly in recent years. Poland is deeply engaged in global value chains in trade with Germany mostly due to foreign direct investments of German companies in the car industry, but also in some other sectors of Polish economy e.g., household equipment (see more: Ambroziak [2016]).

¹¹ This excludes Malta and, ranking close behind it, Cyprus, owing to the very insignificant value of trade. In such a situation, the IIT indices do not properly reflect the scale and character of trade specialization.

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