

Assessing Economic Reform: Insights from Intra-industry Trade Flows

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ABSTRACT. Measured against its central European neighbors, Ukraine has experienced a less than successful path to the reform and integration of its economy since independence. Corruption has continued at an elevated level and annual output growth has been uneven and anemic. Given its geographic position on the edge of the former Soviet Union and the persistence of domestic political schisms, such feeble results might be expected. This paper examines the development of Ukraine's intra-industry trade links with EU partners, in light of its established ties to Russia, as a measure and predictor of the strength of its reform efforts. Its progress is measured against that of its immediate western neighbor: Slovakia. The use of intra-industry trade, as an indicator of both demand and supply side constraints, might reveal the degree to which Ukrainian and Slovak economic considerations have compelled the adoption of reforms. A key economic consideration is the preference for reform and enhanced integration with the EU versus the protection of incumbent interests and links with traditional trading partners. An exploration of developments in Slovakia and Ukraine intra-industry trade provides an indication of which factor currently dominates.

KEY WORDS: international trade, intra-industry trade, macroeconomic planning, integration, economic regionalism

Introduction

With the adoption of political reforms and market-based economic structures in the early 1990s, the countries of central and eastern Europe (CEE) implemented an array of policy and reform approaches on the path to increased global market integration. Since each country in the region possessed divergent initial conditions and engaged in distinct approaches to transition, it is not surprising that little commonality emerged in the resulting macroeconomic conditions across the region. Feinberg and Meurs² relate the development of infrastructure to variances in market and political reforms across the transition countries. On another level, Gouret³ focuses on the alternative paths to privatization to explain how ownership structures have affected output and growth outcomes. In terms of the development of income inequalities within these transition economies, Barlow, Grimalda,

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² *Feinberg R.M. and Meurs M. (2008). Market Reform and Infrastructure Development in Transition Economies. Review of Development Economics, 12(2). P. 237—247.*

³ *Gouret F. (2007). Privatization and output behavior during the transition: Methods matter! Journal of Comparative Economics, 35(1). P. 3-3.*

and Meschi⁴ show that domestic reforms such as price liberalization and privatization have had a more significant effect than the globalization processes originating from the external environment.

In light of the recent work exploring the effects of economic and structural reform on growth, inflation, employment, and foreign direct investment, this paper extends the study of heterogeneous reform approaches in the CEE economies by examining trade flows within a contrasted sample of transition economies. As in Guell and Richards⁵ and Faustino and Leitão⁶, intra-industry trade provides a means to evaluate whether dissimilar approaches to reform are revealed in patterns of international trade via the predicted influence on national demand and supply conditions. In particular, the analysis explores the behavior of intra-industry trade across industrial sectors in two CEE countries that occupy opposite positions on the reform spectrum. Ukraine and Slovakia, although geographical neighbors, are two such opposites in the CEE region with dissimilar reform experiences and divergent paths to European Union (EU) integration. Additionally, the analysis tests the notion that the search for the causes of economic growth in the CEE region can be found in the sectoral differences in its international trade⁷.

After providing some background on the evolution of reform and trade within the two countries under study, Section 2 also examines theoretical models that highlight how trade should have evolved in the two contexts. Section 3 applies the model to data from Ukraine and Slovakia over the transition period from 1996 to 2008. Section 4 discusses the results before concluding in Section 5.

Background

With its adoption of the euro in 2009 and inclusion in the Schengen group, Slovakia currently places relatively high among the CEE countries in terms of vertical EU integration. Figure 1 tracks a broader measure of the evolution of reform in the two countries using data from the 2012 Economic Freedom Dataset⁸.

⁴ Barlow D., Grimalda G., and Meschi E. (2009). Globalisation vs internal reforms as factors of inequality in transition economies. *International Review of Applied Economics*, 23(3). P. 265.

⁵ Guell R.C. and Richards D.G. (1998). Regional integration and intra-industry trade in Latin America, 1980-90. *International Review of Applied Economics*, 12(2). P. 283-300.

⁶ Faustino H. C., and Leitão N. C. (2007). Intra-industry trade: a static and dynamic panel data analysis. *International Advances in Economic Research*, 13. P. 313-33.

⁷ De Benedictis L. and Tajoli L. (2007). Openness, similarity in export composition, and income dynamics. *The Journal of International Trade & Economic Development*, 16(1). P. 93

⁸ Gwartney J., Lawson, R. and Hall J. (2012). Economic freedom dataset, published in *Economic freedom of the world: 2012 Annual Report*. Fraser Institute.

From 2005, Slovakia pressed ahead relative to its regional neighbors in both eastern and western Europe in overall economic freedom. Constructive reforms to Slovak labor and credit market regulations, property rights protection, foreign exchange, and non-tariff trade barriers have contributed to this result. By 2010, Slovakia ranked 35th in terms of economic freedom placing it above many of its established EU partners and well ahead of Ukraine. However, the recent results belie Slovakia's initial conditions, which did not set it at the leading edge of economic reformers among the former command economies. Slovakia's initial reluctance to shift towards a westward political and market focus, despite its close proximity to the EU, delayed essential reforms in the early 1990s. By the mid 2000s, however, sustained reform programs and an emphasis on achieving EU integration by 2004 placed Slovakia among the more advanced reformers in the CEE region.

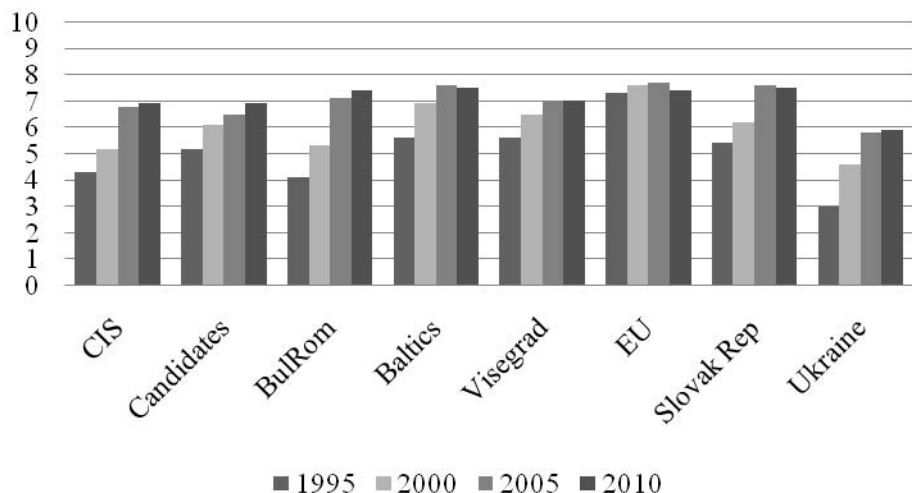


Fig. 1. Index of Economic Freedom

Ukraine ranks at the low end of the reform and integration scale within CEE. Whether the result might stem from its initial preference for membership in the Commonwealth of Independent States (CIS) following the USSR collapse, its proximity to Russia, or the continual divisive demographic and social conditions on the periphery of the EU, Ukraine has achieved less in terms of reform. At 5.94 in 2010, its economic freedom score places it at 122nd in the country rankings. Ukraine's score on property rights protection, business regulation, and controls on the movement of

people and capital remain notably low. The current hesitancy by Ukraine to ratify an EU Association Agreement is also characteristic of Ukraine's lagging efforts to achieve greater economic integration.

In light of the the predictions made in Gouret⁹; Feinberg and Meurs¹⁰; and Barlow, Grimalda, and Meschi¹¹, it might be unsurprising to find a divergence in economic conditions given the dissimilar paths to reform in Slovakia and Ukraine. Figure 2 illustrates the evolution in per capita output in each country and indicates that the gap between the two has increased in Slovakia's favor over the transition period. In 1996 Slovakia's per capita GDP was \$4,050 above that in Ukraine. Despite the 2008 crisis, this difference grew to \$14,031 by 2011.

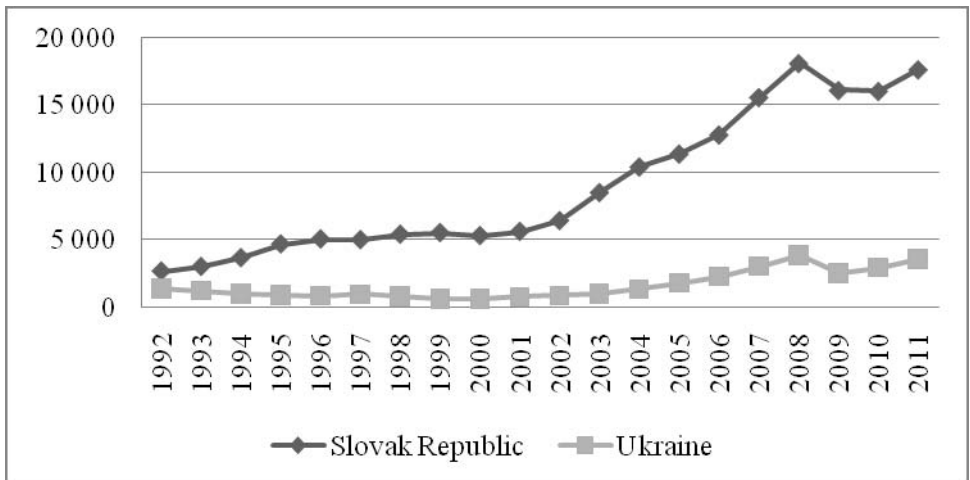


Fig. 2. Slovakia and Ukraine GDP per capita, USD

De Benedictis and Tajoli¹² review a broad array of trade and growth models that support a robust association between a country's international trade performance and its economic growth. It follows from these models that the disparity in per capita GDP between these two CEE neighbors be accompanied by a parallel disparity in the composition of their international trade. Figures

⁹ Gouret F. (2007). Privatization and output behavior during the transition: Methods matter! *Journal of Comparative Economics*, 35(1). P. 3-34

¹⁰ Feinberg R.M. and Meurs M. (2008). Market Reform and Infrastructure Development in Transition Economies. *Review of Development Economics*, 12(2). P. 237-247

¹¹ Barlow D., Grimalda G., and Meschi E. (2009). Globalisation vs internal reforms as factors of inequality in transition economies. *International Review of Applied Economics*, 23(3). P. 265

¹² De Benedictis L. and Tajoli L. (2007). Openness, similarity in export composition, and income dynamics. *The Journal of International Trade & Economic Development*, 16(1). P. 93

3a and 3b indicate that the direction of exports from Ukraine and from Slovakia is indeed different. Slovak exports to its EU partners(averaging 87 % of the total) is well above its eastward exports to the CIS region(averaging 3.8 %). The direction of Ukrainian exports, however, appears to be more balanced between westward and eastward destinations with averages of 31 % and 33 % respectively. A quick test of the trade patterns from 1996 to 2008 between Ukraine and Slovakia and their main trade partners confirms this impression in the direction of trade. The results of Mann-Whitney U tests in Table 1 confirm a significant difference in the direction of exports between Slovakia and its trade partners in the EU and CIS. Conversely, the null is retained in the case of export flows between Ukraine and the EU and CIS indicating balanced export to each region.

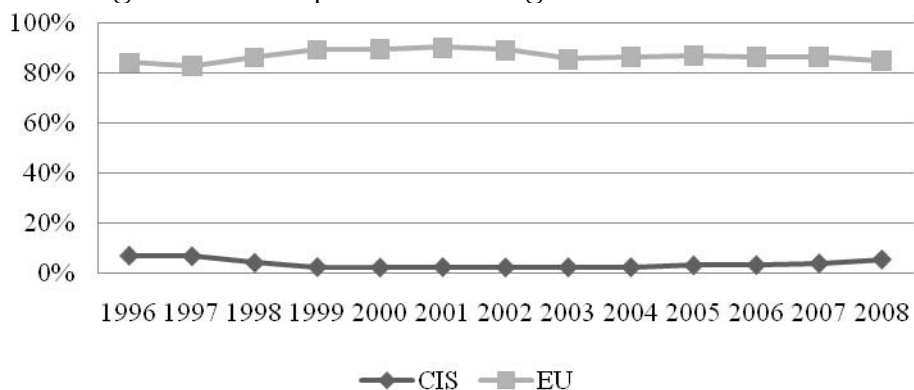


Fig.3a. Slovak Exports to EU and CIS (% of total exports)

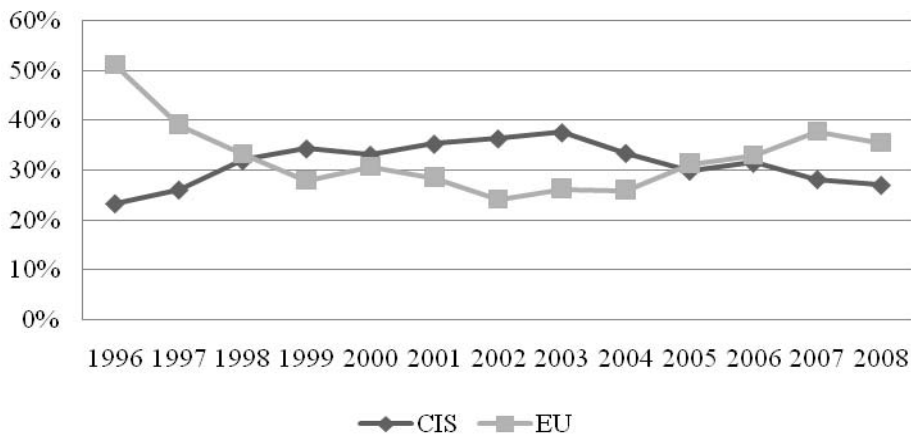


Fig. 3b. Ukraine Exports to EU and CIS (% of total exports)

Given these initial export characteristics, one might attribute the increases in Slovak per capita income to its greater trade interaction with the EU relative to that of Ukraine. Conversely, Ukraine's poor economic performance might be connected to its relatively high interaction with the CIS and, given the Russian dominance (at an average 71 % of its CIS exports) within this group, a reliance on a single export market. However, as Figures 3a and 3b illustrate, there has been no significant change in the pattern of export trade over time that matches the increase in Slovak per capita income illustrated in Figure 2. Slovakia experienced no change (from 84 % to 85 %) in its exports to the EU and a slight decrease in already low levels of export trade with the CIS. Ukraine's exports to the EU and CIS fluctuate within a very narrow band with the former rising above the latter from 1999 to 2004. This brief period of increased (decreased) export share to the EU (CIS) was accompanied by stagnant income growth in Ukraine. In short, the two countries have not experienced parallel shifts in the overall patterns of trade with their EU and CIS partners to accompany the increasing divergence in per capita income levels.

*Table 1. Mann-Whitney U Tests:
Overall exports between regional partners**

	UkraineExports to EU and CIS	Slovak Exports to EU and CIS
N	488	475
Asymp. Sig.	0.944	0.000

*Significance level is 0.05

Since this result runs counter to the prediction in De Benedictis and Tajoli¹³, a closer look at intra-industry trade might help to determine whether the export levels among Slovakia and Ukraine are truly as stable as they appear and whether they conform to the predictions of intra-industry trade models. The next section reviews the predictions made by theories of intra-industry trade that will help to formulate expectations about the nature of trade between Slovakia and Ukraine and their partners across European regions.

¹³ De Benedictis, L. and Tajoli, L. (2007). Openness, similarity in export composition, and income dynamics. *The Journal of International Trade & Economic Development*, 16(1), 93

Model

The standard Heckscher-Olin (H-O) model of international trade has been modified in ways that have both reinforced and extended its conclusions. Prominent among these extensions are models of imperfect competition^{14,15,16,17,18,19} that stimulated subsequent examinations of intra-industry trade or trade across countries within similar industries. A consequence of the intra-industry explanation of international trade are the inferences about the nature of the domestic demand and supply conditions of the trading partners. Originally, Lindner²⁰ recognized that one could expect similarities in demand conditions among countries engaged in a significant degree of intra-industry trade. New trade theory extended this demand-side observation to supply-side attributes (capital-labor ratios, internal and external scale economies, and differentiated output) as generating greater potential for intra-industry trade. Summing across a country's demand and supply side attributes, trade is more likely to be of the intra-industry variant 1) between large countries possessing internal and external economies of scale and 2) countries with similar levels of development rising from comparable factor endowments and institutional structures. Conversely, exchanges between countries at opposite ends of the development scale with asymmetric scale economies, dissimilar factor endowments, and differing institutional approaches presumes more inter-industry characteristics.

The measure of international trade used here to estimate the level of intra-industry trade (IIT) is that established by Gruble and Lloyd (1975):

$$IIT_{ijkt} = \frac{(X_{ijkt} + X_{jikt}) - [X_{ijkt} - X_{jikt}]}{X_{ijkt} + X_{jikt}}, \quad (1)$$

where X_{ijkt} is defined as the exports from country i to country j in commodity sector k in time t .

¹⁴ Krugman, P. (1979). Increasing returns, monopolistic competition and international trade. *Journal of International Economics*, 9(4), 469-480 November

¹⁵ Krugman, P. (1980). Scale economies, product differentiation and the pattern of trade. *American Economic Review*, 70(5), 950-959

¹⁶ Krugman, P. (1981). Intra-industry specialization and the gains from trade. *Journal of Political Economy*, 89, 959-973

¹⁷ Dixit, A. and Norman, V. (1980). *Theory of International Trade*. Cambridge, Cambridge University Press

¹⁸ Lancaster, K. (1980). Intra-industry trade under perfect monopolistic competition. *Journal of International Economics*, 10(2), 151-170

¹⁹ Helpman, E. (1981). International trade in the presence of product differentiation, economies of scale and monopolistic competition. *Journal of International Economics*, 11(3), 305-340

²⁰ Linder, S.B. (1961). *An essay on trade and transformation*. New York, John Wiley and Sons

Using SITC (rev. 3) industry classifications reported in the UN *Commodity Trade Statistics Database*, intra-industry trade indexes are constructed by aggregating across the three-digit industry level for two of nine sectors. The two sectors selected—SITC (rev.3) Code 0 – *Food and Live Animals* that contains 36 three-digit industry sectors and SITC (rev. 3) Code 6 - *Manufactured Goods Classified Chiefly by Material* that contains 52 three-digit industry sectors – represent a wide array of output from commodities to high value-added production.

Results

To disentangle some of the intra-industry relations buried in the aggregate trade data, the results in Table 2 separate the EU and CIS regions into their major subgroups. The EU is divided into its core (EU15) and the more recent member states in central Europe (Visegrad) and the Baltic regions. The CIS is likewise divided to account for Russia's predominant position in that group. The direct IIT relationship running from Slovakia to Ukraine is also traced by separating Ukraine from the CIS (the IIT relationship running from Ukraine to Slovakia is captured in the Visegrad data). Consequently the 'Other CIS' category includes the remaining CIS countries.

Table 2 Average Intra-industry trade as percent of total trade by sector; 1996-2008

Sector	EU15	Visegrad*	Baltics	Ukraine	Russia	Other CIS
Slovakia SITC 0	6.5 %	20.6 %	0.7 %	0.8 %	3.5 %	0.1 %
Slovakia SITC 6	22.6 %	31.7 %	6.9 %	7.5 %	19.9 %	1.3 %
Ukraine SITC 0	2.6 %	4.0 %	3.9 %	—	20.3 %	1.9 %
Ukraine SITC 6	10.1 %	18.0 %	17.1 %	—	49.4 %	8.0 %

*Visegrad group includes Czech Republic, Hungary, Poland, Slovakia, and Slovenia.

Each of the regions possesses distinct characteristics in terms of market conditions, political institutions, and supply and demand patterns with the EU15 occupying the most advanced development level and the Other CIS occupying the least developed level. Theory would predict that the level of intra-industry trade should be higher between countries and those partner countries/regions that closely mirror their level of development. For both SITC classifications included in this study, the highest IIT

levels are found with Visegrad trade for Slovakia and with Russian trade for Ukraine. The lowest IIT levels are found with Other CIS trade in both countries. Trade between each and the Baltic region finds a middle ranking. This unsurprising result indicates that Slovakia is most similar in economic and institutional structures to the other central European nations who joined the EU in 2004 while Ukraine is most similar to its dominant neighbor and partner in the former USSR. Additionally, while Ukraine's IIT levels with the EU15 are less than half that of Slovakia, its IIT levels with the Baltic region more than 500 % (for SITC 0) and 200 % (for SITC 6) larger than that found with Slovakia.

Because the Visegrad countries have been engaged in significant reform efforts required by their accession to the EU, one should be able to discern an increase in the level of Slovak IIT with the EU15 over time. Figures 4a and 4b indicate that Slovakia has indeed steadily increased its intra-industry trade with the EU15 over time while maintaining, albeit with greater variation, its IIT with the Visegrad region. Although starting from modest levels in 1996, EU15 IIT levels in both the SITC 0 and 6 sectors have approximately doubled to 2008 indicating that Slovakia's deeper integration with the EU15 has resulted in greater similarities with the EU's market and institutional structures. The reform pressures felt in the run-up to and aftermath of EU accession in 2004 contributed to the structural development of Slovakia's economy with consequent effects on the increasing pattern of its IIT with the EU15 and higher per capita income. Slovakia has also maintained or increased its IIT levels with partners in the Visegrad and Baltic regions who faced similar reform requirements of EU accession.

The case of Ukraine illustrated in Figures 5a and 5b offers a decidedly different picture of the regional evolution of IIT. Unlike the Slovak case, Ukraine's IIT with the EU15 and the reformers in the Visegrad and Baltic regions has not experienced a sustained change in either SITC sector from 1996-2008. It must be noted, however, that there is also no change in Ukraine's IIT levels with its Other CIS partners. It is in Ukraine's IIT levels relative to Russia that one observes substantial adjustments over time. For the 36 industry sectors in SITC code 0, Ukraine has experienced a 4.5 fold increase in the level of intra-industry trade from 7 % in 1996 to 32 % in 2008. Although less pronounced and more variable, Ukraine's IIT levels with Russia in the 52 industry sectors in SITC code 6 have shown a general increase moving from 46 % to 56 % over the 1996-2008 period.

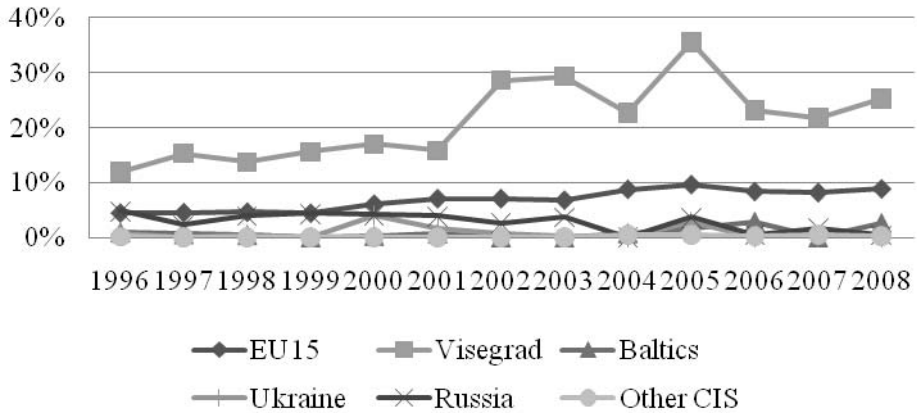


Fig. 4a. Evolution of Slovak IIT SITC Code 0

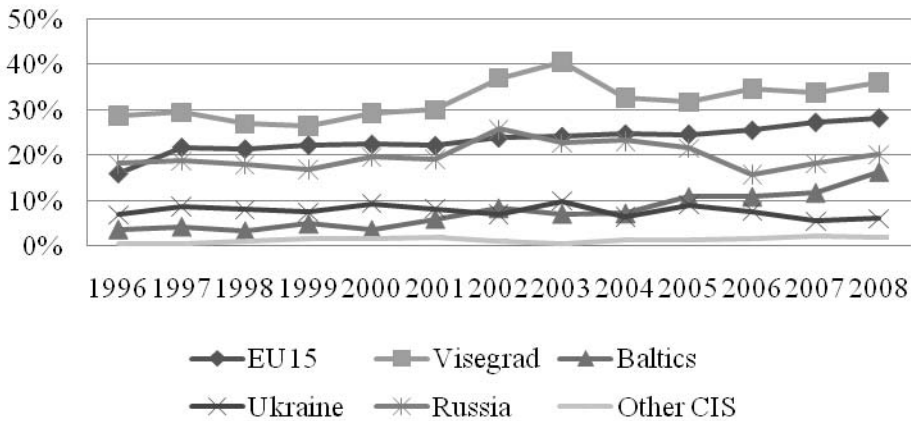


Fig. 4b. Evolution of Slovak IIT SITC 1 Code 6

The IIT results indicate that Ukraine has not adapted itself to match EU economic or institutional structures nor has it kept up with the pace of reform found with its western neighbors. The increased levels of Ukrainian IIT with Russia instead indicate greater eastwards integration and an approach to reform that mimics the pace and extent found in Russia. As a consequence, the lack of structural development of Ukraine's economy contributed to the increasing pattern of its IIT with Russia that might contribute to the stagnation in its per capita income.

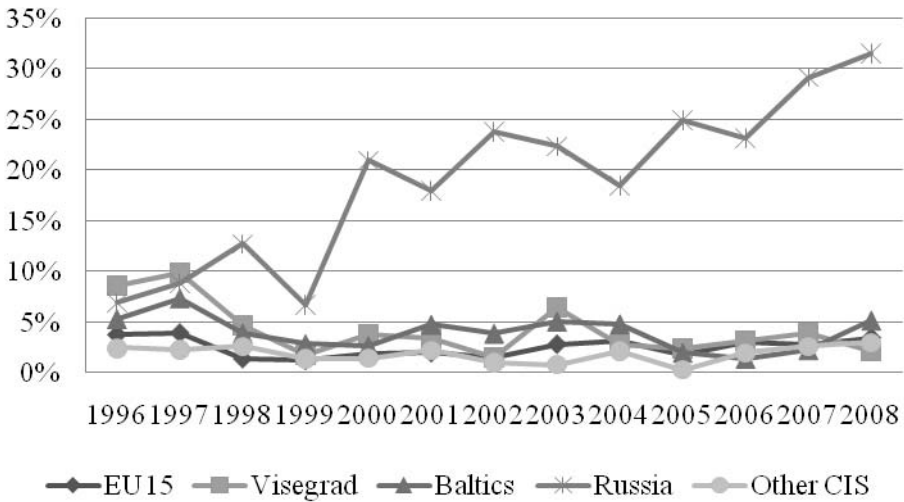


Fig. 5a. Evolution of Ukraine IIT SITC Code 0

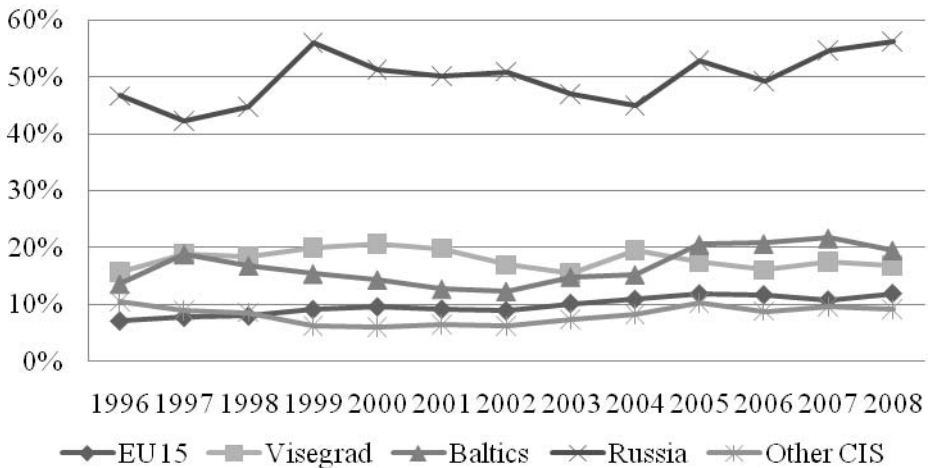


Fig. 5b. Evolution of Ukraine IIT SITC Code 6

Summary

Since the early 1990s, the countries of central and eastern Europe have approached reform and greater openness to international trade with varying degrees of commitment. To date the results have revealed a degree of unevenness in progress towards convergence to Western levels of income and development.

Ukraine and Slovakia are examples of such variance. Economic theory indicates that the dissimilar outcomes will be accompanied by distinctions in the pattern of trade that reflect underlying demand and supply side conditions. To verify this assumption, the study decomposed trade activity in Ukraine and Slovakia relative to the flows to subgroups of EU and CIS member states. Regional indexes of intra-industry trade were constructed and compared with theoretical predictions on market characteristics and institutional development.

In terms of the industry sector decomposition, the results indicate greater intra-industry trade between Slovakia and the Visegrad, Baltic, and EU15 regions that reflects both initial similarities with its immediate neighbors and the subsequent implementation of reforms to meet EU standards. The Slovak economy has become increasingly similar to its EU15 partners in terms of industry structure and economic performance. When compared against its central European neighbor (or any country for that matter), Ukraine has experienced a less than successful path to the reform and integration of its economy since independence. Corruption has continued at an elevated level and annual output growth has been anemic. Given its geographic position on the edge of the former Soviet Union, the significance of ties to Russia, and the persistence of domestic political schisms, such feeble results might be expected. The pattern of its intra-industry trade reveals an increasing similarity with supply and demand conditions in Russia and less convergence with European Union standards.

Much focus—both of policy and inquiry — has been on progress in trade flows with the EU as a pathway to development. Despite official efforts to achieve greater integration with the European Union, Ukraine's recent intra-industry trade patterns indicate a trend away from EU standards with, instead, a consistent turn towards similarities with the Russian market. A key consideration is the preference for reform and enhanced integration with the EU versus the protection of incumbent interests and links with traditional trading partners. An exploration of developments in Ukraine's intra-industry trade provides an initial indication of which factor currently dominates.

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