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Michael Funke and Ralf Ruhwedel

Trade, product variety and welfare: A quantitative assessment for the transition economies in Central and Eastern Europe

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Contents

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Michael Funke* and Ralf Ruhwedel

Trade, product variety and welfare: A quantitative assessment for the transition economies in Central and Eastern Europe

Abstract

We calculate welfare gains of trade liberalization in the Central and East European transition economies, following the approach of Romer (1994), who emphasized that proper modeling of the impact of trade restrictions on the number of available product varieties is crucial to quantifying the welfare impact of trade liberalization. The empirical work relies on direct measures of product variety calculated from 5-digit trade data. Although the issue is far from settled, the emerging conclusion is that freer trade has boosted welfare.

Keywords: Trade Liberalization, Product Variety, Welfare, Transition Economies
JEL-Classification: D60, F14, F15

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Michael Funke and Ralf Ruhwedel

Trade, product variety and welfare: A quantitative assessment for the transition economies in Central and Eastern Europe

Tiivistelmä

Tutkimuksessa lasketaan kaupan vapauttamisesta seuraavaa hyvinvoinnin lisääntymistä Keski- ja Itä-Euroopan siirtymätalouksissa. Työssä käytetään Romerin (1994) menetelmää, joka ottaa huomioon kaupan esteiden vaikutuksen saatavilla olevien tuotteiden määrään. Empiiriset laskelmat on tehty yksityiskohtaisen kauppadatan avulla. Vaikka tulokset ovatkin alustavia, näyttää siltä, että vapaampi kauppa on kohentanut hyvinvointia.

Asiasanat: kaupan vapauttaminen, tuotevalikoima, hyvinvointi, siirtymätaloudet

1 Introduction

We consider here a very old question: What are the welfare gains to a country that opens up its borders to international trade?

Economists measure the welfare gains of integration in terms of growth rates or static efficiency. There is a preponderance of empirical cross-country evidence that trade liberalization and openness to trade increases the growth rate of income and output. In addition, numerous individual country studies over the past three decades suggest that trade causes growth.[1] A country's trade policy is the key link in the transmission of price signals from the world market to the national economy. Undistorted price signals from world markets allow resource allocation consistent with comparative advantage, thereby increasing productivity. An open trade and investment regime, in turn, encourages integration into the global trading environment and the import of diverse and modern technologies that are important for productivity improvements. Given the positive association between openness and growth, trade liberalization can be expected to help the poor overall.

Traditional estimates of static efficiency gains from trade liberalization, in contrast, have been rather small. Most studies find the cost of protection for different countries in different years to be no more than 1% of GDP. Moreover, studies that employ static computable general equilibrium models generate similar numbers for triangular losses [e.g. Harris (1984)].

One inherent weakness of this conventional analysis of protection is the assumption that the set of goods is both fixed and complete. Prices may change, but the list of goods that are traded at some price, in some quantity, does not change. Romer (1994) loosened this assumption and emphasized that proper modeling of the impact of trade protection on the change in the number of available varieties is crucial to quantifying the welfare impact of trade liberalization. He incorporated this idea into a simple model with a single final good produced using labor and differentiated inputs imported from abroad which incur some fixed cost (e.g. overhead related to dealing with an international supplier). The larger the number of inputs, the lower the cost of production.[2]

The paper proceeds as follows: In section 2, we briefly discuss the welfare gains arising from a wider diversity of imports. In section 3, we map out Feenstra's (1994) method for measuring variety growth, describe the dataset, and present empirical results for the Central and East European transition economies. We focus on these countries because radical change should reveal causal relationships. Needless to say, the sample period 1993–2000 witnessed dramatic changes in these countries, many of which did not even exist as independent states at the beginning of the 1990s. In section 4, we offer conclusions and possible directions for future research.

[1] For example, Sachs and Warner (1995) estimated that open economies average higher growth of about 2.45 percent compared to closed economies. The differences between open and closed economies were even greater among developing countries. Frankel and Romer (1999) further demonstrated that adjusting for the endogeneity bias in cross-country regression studies such as Sachs and Warner (1995) does not reduce the estimated impact of openness on growth.

[2] Compare Boeri and Oliveira-Martins (2001), Feenstra et al. (1999a) and (1999b) and Funke and Ruhwedel (2001, 2003). The thin empirical evidence on product variety, economic growth and transition is reviewed at www.worldbank.org/wbi/B-SPAN/sub_productivity_growth.htm.

2 Trade restrictions and product variety

To keep things simple and frame the main message, we offer the following diagram.

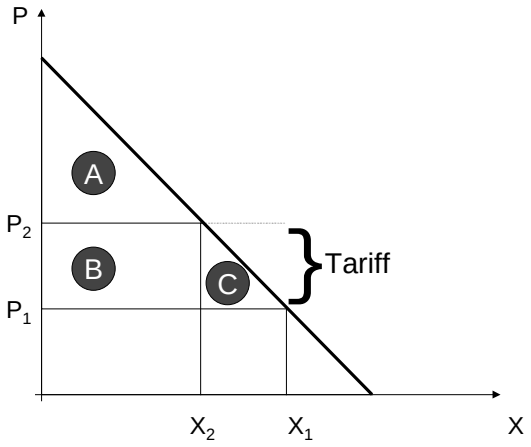

Figure 1. New goods and the welfare Costs of trade restrictions.

Assume a small economy, where all agents take world prices as exogenously given. Figure 1 shows a simple demand line for a hypothetical imported good with price plotted on the vertical axis and quantity on the horizontal axis. The graph shows a point of equilibrium at a price P_1 and a quantity of X_1. The corresponding consumer surplus is given by the triangle $A+B+C$. Now suppose that the government has imposed a tariff on the import good. The price rises by the amount of the tariff, from P_1 to P_2; the quantity demanded falls from X_1 to X_2.[3] Further, the consumer surplus shrinks. This dwindling comes in two parts. The larger part, shown by area B, is the tariff revenue collected by the government. The foregone surplus – the triangle marked C – is the deadweight loss. Conventional estimates of the cost of protection are based upon the size of C.[4] Romer (1994), however, argues that such calculations may substantially understate the costs of protection arising from trade restrictions, taxes, corruption, or bureaucratic red tape, because the set of goods that are traded is not fixed in the real world. Suppose that introducing a new good to a market incurs a fixed cost such as the cost of advertising or establishment of a service and parts supply network. The increasing-returns-to-scale technology – or, equivalently, decreasing-average-cost technology – implies a cost function $C = a + bX$, where the fixed cost a and the constant marginal cost b is assumed to be

[3] For the sake of argument, we again assume that the buyers absorb all the burden of the tariff.

[4] Formally, the less-than-striking triangular efficiency losses from trade restrictions are given by the formula $\frac{1}{2}\alpha\beta\tau^2$, where τ is the ad valorem tariff rate, α is the import share, and β is the absolute value of the price elasticity of demand for imports. Because α and β are about 1 and τ is a number much smaller than 1, calculations based on this formula are expected to yield second-order welfare effects unless the tariff barrier is very high.

the same regardless of the tariff regime under which the country operates.[5] The introduction of increasing-returns-to-scale technologies is, however, not inconsequential for the potential gains from variety with a tariff reduction. Because of fixed selling costs, some amount of revenue is required for a good to be sold at all. Therefore, even a tiny tariff may cause a good never to appear. In other words, if a tariff (tariff removal) leads to the withdrawal (appearance) of a (new) good, then the corresponding loss (welfare gain) is not the *C*-triangle, but the entire social surplus, *A*+*B*+*C*.[6] Likewise, this "market size" effect can be illustrated with the help of Figure 2.

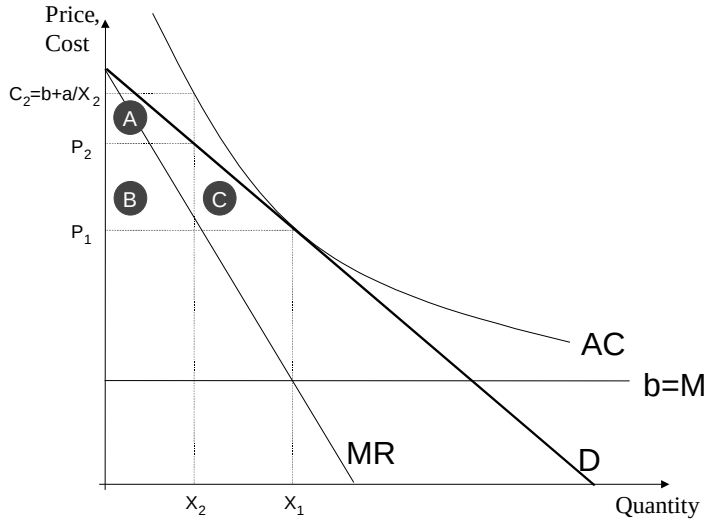

Figure 2. Protection leading to disappearance of goods.

We now consider the demand (*D*) for an imported consumption good (*X*). When the consumption good is produced with a constant-returns-to-scale technology with constant marginal (*M*) and an average unit cost of *b*, and there is no tariff, then the equilibrium demand is at X_1. Next, suppose an ad valorem tariff is imposed on this good. In the new equilibrium, the quantity demanded is X_2. Can foreign producers stay in business when the price is equal to P_2? The answer under constant returns to scale is an unambiguous "yes," because producers will always receive the price *b* for each unit, regardless of the sales level. Since *b* is also the unit cost of production, they will just break even and be able to stay in business no matter if they sell X_1 or X_2. Thus, under constant returns to scale, the available varieties of imports will be the same before and after the introduction (or removal) of a tariff. The only effect of a tariff is that each import good will now be produced in a smaller (larger) amount to match the

[5] This is the only technology consistent with the national product differentiation assumption, typically introduced to account for the cross-hauling puzzle in trade statistics.

[6] To illustrate, Romer (1994) calibrates a model with intermediate varieties in an Ethier-Dixit-Stiglitz framework. With fixed costs, tariffs reduce the variety of capital goods available. In a conventional world with a fixed list of capital inputs, a tariff of 10% reduces GDP by 1%. However, in the opposite case of changing product variety, the welfare cost is hefty – about 20% of GDP.

decline (increase) in the quantity demanded. Thus, moderate tariff changes tend not to have any visible consequences for product variety under constant-returns-to-scale technologies. Now consider the alternative case in which imports are produced with an increasing-returns technology, whose cost function is given by $C = a + bX$. Unlike in the constant-returns-to-scale case, producers of the import good suffer a loss when demand falls below X_1. This can be seen in Figure 2 by the fact that the demand curve stays always to the left of and below the average cost curve (AC) when demand is below X_1. This implies that producers will always suffer a loss if they cut production below the pre-tariff level. As a result, the foreign producer will be forced out of business and variety will disappear from the market, i.e. the tariff has a "market-size" effect. The complete withdrawal of the product again leads to the loss of the entire consumers' surplus represented by the area $A+B+C$.[7]

While the appearance of new goods is a fundamental feature of the modern economy and has been the subject of analysis in various endogenous and semi-endogenous growth models, quantitative papers tackling the gains-from-variety effect do not abound. Accordingly, our empirical analysis of the welfare gains from the introduction of new goods in section 3 below is offered as a step toward redressing this deficiency in the literature.

3 Empirical estimates of variety gains in the central and East European transition economies

Our empirical work builds on Feenstra (1992, 1994) and Hummels and Klenow (2002), who have mapped out a procedure for calculating welfare gains arising from product variety. Letting m_i denote the imports of country i and m_W the corresponding world imports, we decompose each country's share of world imports (m_i/m_W) into the product of an extensive and intensive import margin, such that

$$\frac{m_i}{m_W} = \left(Intensive\ Import\ Margin\right) \cdot \left(Extensive\ Import\ Margin\right). \tag{1}$$

The intensive and extensive import margins in (1) can be written as

$$Intensive\ Import\ Margin = \frac{m_i}{\sum_{j \neq i} \sum_{s \in M_{ijs}} m_{Wjs}}, \tag{2}$$

and

[7] The concept of the gains-from-variety effect holds inherent dangers. While it typically would be used to argue for free trade, it can paradoxically undermine its own case, because the second welfare theorem does not hold under increasing returns to scale. Therefore, a social optimum cannot typically be implemented by a free-market economy without government intervention in the presence of such technology.

$$(3) \qquad Extensive\ Import\ Margin = \frac{\sum_{j \neq i} \sum_{s \in M_{ijs}} m_{Wjs}}{m_W},$$

where m_{Wjs} are the world imports from country j in product variety s, and M_{ijs} are all those product varieties (i,j) for which the imports by country i from country j in product variety s is positive ($m_{ijs} > 0$). The interpretation of both margins is straightforward. The intensive import margin in (2) measures a country's share of world imports in those product varieties in which it imports. Conversely, the extensive import margin for country i in (3) measures the fraction of world imports that occur in those product varieties in which country i imports. Other things equal, if a country concentrates all of its imports in a small number of product varieties, it will have a higher intensive import margin and a lower extensive margin. If that country spreads its imports thinly over many product varieties, it will have a lower intensive import margin and a higher extensive margin. Romer's (1994) model sketched above is consistent with economies importing mostly on the extensive import margin because of fixed costs of importing each variety.

Welfare changes are notoriously difficult to measure; indirect routes must typically be used. To translate a changing extensive margin for imports into welfare, we adopt Feenstra's (1994) methodology for estimating welfare gains from import variety growth. Feenstra (1994) and Hummels and Klenow (2002) have mapped out that the GDP-equivalent of the welfare gains (VG) from import variety can be expressed as

$$(4) \qquad VG = \left(\frac{m_i}{y_i}\right)(Extensive\ Import\ Margin)^{1/(\sigma-1)},$$

where (m_i/y_i) is the import share and σ is the elasticity of substitution between import varieties.[8] To sum up, our goal in computing welfare gains is to gauge how well different economies are performing in terms of import variety growth. Since this is an important idea, let us explain the logic by way of the textbook example depicted in Table 1 below. The table shows the quantities of the three product categories (1, 2 and 3) imported by three hypothetical economies (A, B and C) initially.

Table 1. Initial imports of three goods by three countries

	Country *A*	Country *B*	Country *C*
Product 1	0 / 100 / 100	50 / 0 / 50	33 / 33 / 0
Product 2	0 / 0 / 0	50 / 0 / 50	33 / 33 / 0
Product 3	0 / 0 / 0	0 / 0 / 0	34 / 34 / 0
m_i	200	200	200

Note: The matrix element 0/100/100, for example, indicates that imports of product 1 by country A from country B and country C are equal to 100, respectively.

[8] The specific form of the "variety effect multiplier" arises when utility is determined by the love of variety *CES*-utility function $U = \left(\sum_{i=1}^{n} m_i^{\rho}\right)^{1/\rho} = \left(nm^{\rho}\right)^{1/\rho} = n^{(1-\rho)/\rho} m = n^{1/(\sigma-1)} m$. The multiplier increases with the number of differentiated imports m_i and increases as σ decreases toward 1 ($\sigma > 1$). Because trade will increase the number of varieties available to each consumer, trade will increase every consumer's welfare. Of course, this is based on the assumption that every consumer prefers more varieties to fewer.

From these data and equations (2) and (3), we can derive the initial intensive and extensive import margins, respectively. The results are summarized in Table 2 below.

Table 2. Initial intensive and extensive import margins

	Country *A*	Country *B*	Country *C*
Intensive import margin	200/166 = 1.21	200/332 = 0.60	200/400 = 0.50
Extensive import margin	166/600 = 0.28	332/600 = 0.55	400/600 = 0.67

Table 2 shows that if an economy like country *A* concentrates all of its imports in a small number of product categories, it has a higher intensive import margin and a lower extensive import margin. Other things equal, if an economy like country *C* spreads its imports over many product categories, it has a lower intensive import margin and a higher extensive import margin.

In Romer's (1994) model sketched above, lowering trade barriers enhances demand for foreign varieties. To measure the welfare gains of a greater variety of import goods, we suppose that the import flows after trade liberalization are as shown in Table 3.

Table 3. Import flows after trade liberalization

	Country *A*	Country *B*	Country *C*
Product 1	0 / 100 / 100	50 / 0 / 50	66 / 66 / 0
Product 2	0 / 50 / 50	50 / 0 / 50	66 / 66 / 0
Product 3	0 / 50 / 50	100 / 0 / 100	68 / 68 / 0
m_i	400	400	400

The corresponding extensive import margin is given in Table 4 below. The table also gives *VG* using $\sigma = 5$ (which implies a mark-up of 25%) and an import share equal to 20% (pre-liberalization) and 25% (post-liberalization), respectively.

Table 4. Extensive import margins and import variety gains

	Country *A*	Country *B*	Country *C*
Extensive import margin	800/1200 = 0.67	800/1200 = 0.67	800/1200 = 0.67
3.1.1.1 VG_0	14.5%	17.2%	18.1%
VG_1	22.6%	22.6%	22.6%

Notes: VG_0 gives the pre-reform variety gains for the initial extensive import margin [for example, $VG_{A,0} = 0.20 \cdot (0.28)^{0.25} = 0.145$]; VG_1 gives the variety gains for the post-reform extensive import margin [$VG_{A,1} = VG_{B,1} = VG_{C,1} = 0.25 \cdot (0.67)^{0.25} = 0.226$.

Table 4 has a simple interpretation: countries that import more varieties after trade liberalization (like country *A* and *B*) enjoy greater welfare gains. Hopefully, this simple textbook detour has helped clarify some of the basic points made earlier. Obviously, we have described an extremely simple situation. In reality, we have thousands of different products. The calculations then become messier and much more cumbersome, but the essential idea of the procedure is the same.

The advantage of variety is particularly important for economies that can produce only a limited range of goods on their own. Seen this way, the benefits of trade integration look potentially vast for the Central and East European transition economies. The foreign trade regime of the Central and East European transition countries has changed fundamentally since 1989, both in scope and in speed. Tariffs have been reduced, many quantitative restrictions (quotas) have been dismantled and exchange controls have virtually disappeared.[9] Furthermore, trade has been re-oriented from East to West, as the Council for Mutual Economic Assistance (*CMEA*) and the Soviet Union collapsed.[10] This collapse effectively terminated whatever production sharing existed under central planning. Finally, most countries under consideration have also become well integrated in the multilateral trading system, including *WTO* membership.[11] These developments have offered unique opportunities to small producers to move from servicing small local markets to supplying large firms and markets abroad by readjusting their production structures.

Although markets have been opened up and large distortions in trade incentives have been substantially corrected as concessions in the Uruguay Round negotiations, tariffs have been retained as an instrument of trade policy. The remaining tariff protection in East European transition countries, however, is relatively low relative to countries at similar levels of development. As a result of these developments, imports have increased at impressive rates. The level of protection that has evolved is, however, uneven. Outside products controlled for health and safety reasons, the Baltics have extremely low tariff rates with little dispersion. Estonia, for example, has almost no import tariffs at present and therefore has one of the most, if not the most, liberal trade regime in the world. At the other end of the policy spectrum, trade regimes continue to be more restrictive in Belarus, Russia and the Ukraine. In between, one finds the remaining countries.[12] Another yardstick to gauge the significance of trade

[9] Drábek and Smith (1995, Table 1, p. 23) calculate that the average tariff reductions in the Czech Republic, Hungary, Poland and the Slovak Republic have been in the range of 22 to 38 percent. Wang (2001) investigated the impact of tariffs and nontariff barriers on imports across 70 countries. He finds that a 1 percent point increase in a tariff rate reduces imports by 2 percent. An important aspect of trade liberalization is the link between trade liberalization and competition. The East European transition countries entered the economic transformation process with highly concentrated market structures. In these circumstances, trade liberalization provided discipline on the market power of domestic producers. It is therefore not surprising that the transition countries have made trade liberalization an early and important component of market- oriented reforms.

[10] The rapid reorientation of trade has been amply documented and discussed in Drábek and Smith (1995) and Rodrik (1992). Regional agreements with the EU were clearly a major force behind the expansion and geographic reorientation of trade. One might argue that trade growth was simply the result of re-direction of exports and imports from CMEA markets to EU markets. But a simple re-direction occurred earlier in 1990–1992. The increase in trade over 1993–2000 came from re-tooled capacities and a finer division of labor based on production sharing [see e.g. Djankov and Hoekman (1997)]. New technologies also facilitated the fragmentation of production processes, i.e. the division of the value chain into smaller functions that could be contracted out to suppliers located in different countries. The result of these developments is – to borrow a phrase from Feenstra (1998) – integration of trade and disintegration of production in the global economy.

[11] The process of accession to the WTO has been complex, prolonged, and difficult for most countries. The average time for accession was over five years for the six most recent WTO members. Persistent protective pressures in Belarus, the Russian Federation, and Ukraine have inhibited accession of these three countries to the WTO. All three countries, however, have "observer" status, which requires their accession negotiations commence within five years of becoming observers.

[12] Trade-weighted import tariffs on non-agricultural and non-fuel products are available from the *Unctad Handbook of Statistics On-Line* at http://www.unctad.org/Templates/Page.asp?intItemID=1890. There is,

restrictions is the level of import duties. A quick glance at the import duties in Table 5 also indicates that import regimes have become rather liberal by international standards in most countries of the region.

Table 5. Import duties (% of Imports)

Country	1993	1994	1995	1996	1997	1998	1999	2000
Belarus	-	-	1.69	2.31	4.12	-	-	-
Bulgaria	6.09	5.81	5.55	3.48	4.58	5.47	2.76	1.73
Czech Republic	3.53	3.47	2.61	2.63	1.72	1.46	1.24	1.10
Estonia	0.94	0.94	0.22	0.001	0.001	0.0001	0.0001	0.05
Georgia	-	-	-	-	4.30	3.60	1.25	2.21
Hungary	11.49	12.59	12.97	9.68	3.40	2.66	2.48	1.78
Latvia	-	3.16	1.78	1.48	1.41	1.07	0.94	0.76
Lithuania	0.91	3.02	1.37	1.24	1.27	1.12	1.06	0.69
Poland	-	17.43	14.01	10.04	5.29	3.86	3.11	2.42
Romania	6.63	5.98	6.16	5.69	5.10	6.21	5.52	-
Russian Federation	-	2.44	3.17	-	-	5.13	4.87	5.10
Slovak Republic	-	-	-	2.85	3.22	2.50	2.64	2.22
Slovenia	7.29	6.96	7.09	6.17	3.99	2.88	2.55	1.72
Ukraine	-	-	-	-	-	-	2.31	1.91
United States	3.22	3.03	2.59	2.34	2.06	2.01	1.79	1.63

Notes: Import duties comprise all levies collected on goods at the point of entry into the country. The levies may be imposed for revenue or protection purposes and may be determined on a specific or ad valorem basis, as long as they are restricted to imported goods. Data are shown for central government only and are taken from the *World Bank Indicators 2002*. The US has been included for comparative purposes.

The next task therefore is to make the procedure above operational for 14 Central and East European transition economies using highly disaggregated import data at the five-digit *SITC* level for the years 1993 to 2000.[13] The most important advantage of these data is that the classification of goods is consistent across countries and time.[14] Data on import shares come

however, no unified measure of protection. Recently, the International Trade Center (*UNCTAD-WTO*) in collaboration with the *CEPII* has set up a database (*MAcMaps*) for analyzing trade barriers at a very disaggregated level (see http://www.cepii.fr/anglaisgraph/workpap/summaries/2001/wp01-18.htm for further details).

[13] While models with product variety are now common, empirical applications lag far behind. This deficiency is serious because "showing that something can be true in a model does not make it so" [Romer (1994), p. 35]. Despite the short data availability for trade flows (1993-2000) in the Central and East European transition economies, the radical changes in the trade structure occurred allow us to witness important welfare changes, even in this relatively short lapse of time.

[14] The classification distinguishes 1,473 commodities under the Standard International Trade Classification (*SITC* Revision 2). The use of pre-established product categories makes it impossible to measure gains in product variety within any specific category and beyond the number of pre-established product categories. This puts a premium on the level of disaggregation in the data. One should expect a greater ability to differentiate between nations as the data become more detailed. All data were collected from the OECD database *International Trade by Commodities Statistics – ITCS Classification*, Paris 2002 and are expressed in current US dollars. Given the merchandise trade data source, all proxies we derive pertain to imports from OECD countries alone. Moreover,

from the World Bank's *World Development Indicators* 2002 database. The real-world trade pattern leads to the extensive and intensive import margins in Tables 6 and 7 below.

Table 6. Extensive import margins

	1993	1994	1995	1996	1997	1998	1999	2000	Average 1993-2000
Belarus	0.347	0.359	0.375	0.371	0.366	0.370	0.359	0.359	0.363
Bulgaria	0.417	0.415	0.424	0.406	0.402	0.415	0.402	0.399	0.410
Czech Republic	0.429	0.432	0.437	0.423	0.417	0.423	0.414	0.406	0.423
Estonia	0.405	0.408	0.417	0.403	0.406	0.413	0.405	0.396	0.407
Georgia	0.253	0.274	0.287	0.324	0.348	0.360	0.347	0.337	0.316
Hungary	0.429	0.432	0.436	0.417	0.416	0.421	0.413	0.399	0.420
Latvia	0.376	0.387	0.395	0.385	0.389	0.403	0.395	0.380	0.389
Lithuania	0.361	0.388	0.399	0.392	0.387	0.397	0.401	0.374	0.387
Poland	0.428	0.433	0.437	0.423	0.419	0.424	0.415	0.407	0.423
Romania	0.410	0.416	0.420	0.411	0.409	0.414	0.408	0.394	0.410
Russian Federation	0.422	0.432	0.435	0.419	0.418	0.425	0.416	0.408	0.422
Slovak Republic	0.415	0.414	0.424	0.406	0.406	0.411	0.399	0.395	0.409
Slovenia	0.428	0.431	0.436	0.417	0.411	0.424	0.413	0.403	0.420
Ukraine	0.403	0.407	0.411	0.403	0.402	0.412	0.398	0.388	0.403

Table 7. Intensive import margins

	1993	1994	1995	1996	1997	1998	1999	2000	Average 1993-2000
Belarus	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Bulgaria	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Czech Republic	0.008	0.009	0.010	0.012	0.012	0.012	0.012	0.013	0.011
Estonia	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002
Georgia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hungary	0.007	0.008	0.008	0.009	0.011	0.012	0.012	0.013	0.010
Latvia	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Lithuania	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001
Poland	0.012	0.012	0.014	0.017	0.019	0.020	0.019	0.018	0.016
Romania	0.003	0.003	0.004	0.004	0.004	0.005	0.004	0.005	0.004
Russian Federation	0.019	0.017	0.017	0.020	0.023	0.018	0.011	0.012	0.017
Slovak Republic	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.003
Slovenia	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.005
Ukraine	0.002	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.002

one can only count predefined categories up to the maximum number of categories in the *SITC* Rev. 2 coding system. In other words, we cannot see new products arriving within an existing category and one cannot see the invention of truly new categories, because there is a de facto fixed frontier in observable product variety. Therefore, our estimates miss a potential source of variety gains.

The results in Tables 6 and 7 indicate that the East European transition economies are generally characterized by low (rather high) intensive (extensive) import margins. In other words, the results tell us that greater imports mostly take the form of more product categories rather than the form of more imports per product category.

With extensive and intensive import margin estimates obtained, we now proceed to compute the welfare gains. Table 8 provides the corresponding variety welfare gains (VG) à la Romer (1994) based upon equation (4) for the years 1993–2000 for $\sigma = 5$ (a markup of 25%) and $\sigma = 2$ (a markup of 100%), respectively.[15]

[15] Among manufactured goods, Feenstra (1994, 1995) has estimated import elasticities of substitution in the range of $2.47 < \sigma < 8.03$.

Table 8. Variety welfare gains

	1993	1994	1995	1996	1997	1998	1999	2000	Average 1993-2000
σ = 2									
Belarus	1.01	5.38	10.26	11.92	13.07	12.28	8.94	10.18	9.13
Bulgaria	19.12	17.39	17.68	20.96	19.54	16.93	17.53	21.63	18.85
Czech Republic	15.56	15.72	21.25	20.29	21.39	22.68	21.89	25.76	20.57
Estonia	9.23	17.19	22.15	29.59	35.41	34.76	32.47	37.83	27.33
Georgia	1.84	5.47	5.83	7.23	9.18	8.79	7.47	7.25	6.63
Hungary	13.93	15.13	15.09	14.98	19.34	22.99	24.07	28.03	19.20
Latvia	6.80	8.81	14.63	17.39	18.78	21.16	17.46	16.96	15.25
Lithuania	13.45	17.24	22.62	22.65	22.79	21.41	18.17	18.01	19.54
Poland	9.37	9.43	9.99	10.92	12.29	12.59	12.29	12.60	11.18
Romania	10.15	9.84	12.16	13.31	13.07	11.71	12.07	14.02	12.04
Russian Federation	2.87	5.13	6.01	6.12	6.59	8.87	8.70	7.39	6.46
Slovak Republic	21.11	18.82	20.24	22.44	23.30	25.21	22.53	26.41	22.51
Slovenia	21.98	21.88	22.09	20.82	21.15	21.86	20.72	22.47	21.62
Ukraine	5.39	8.33	12.97	15.95	13.72	14.43	14.93	17.11	12.85
σ = 5									
Belarus	2.22	11.59	21.41	25.09	27.81	25.86	19.27	21.95	19.40
Bulgaria	36.83	33.61	33.67	41.20	38.71	32.72	34.73	43.09	36.82
Czech Republic	29.37	29.50	39.54	38.71	41.22	43.25	42.38	50.68	39.33
Estonia	18.19	33.69	42.71	58.46	69.57	67.46	63.97	65.84	52.49
Georgia	5.16	14.46	14.85	16.84	20.26	18.92	16.52	16.37	15.42
Hungary	26.28	28.42	28.13	28.85	37.31	44.00	46.73	55.86	36.95
Latvia	14.16	17.93	29.38	35.58	38.12	41.81	35.06	35.04	30.89
Lithuania	28.90	35.06	45.01	45.71	46.44	42.79	36.07	37.70	39.71
Poland	17.72	17.65	18.57	20.80	23.61	23.94	23.75	24.73	21.35
Romania	19.80	18.99	23.32	25.92	25.56	22.70	23.62	28.18	23.51
Russian Federation	5.49	9.62	11.23	11.75	12.69	16.86	16.80	14.47	12.36
Slovak Republic	40.81	36.45	38.51	44.15	45.85	49.12	44.88	52.98	44.09
Slovenia	41.50	41.14	41.16	40.11	41.19	41.64	40.26	44.44	41.43
Ukraine	10.65	16.36	25.26	31.52	27.19	28.07	29.79	34.79	25.45

Several observations can be drawn from the data tabulated in Table 8. The most general one is that trade liberalization has boosted welfare. The results therefore clearly support the paradigm that trade liberalization can lead to significantly higher real incomes, and the results are consistent with estimated gains of trade liberalization from cross-country growth regressions.[16] Second, some transition economies fared much better than others in terms of welfare gains. Even a cursory examination reveals that the biggest beneficiaries were those countries that followed the path to radical liberal reforms. The Czech Republic, Estonia, Hungary, the

[16] A policy-induced change in welfare of such magnitude is quite plausible. To put these numbers in perspective, Rutherford and Tarr (1998) show that a welfare gain of between 10 and 35 percent corresponds to an increase in the steady state growth rate of between 0.4 and 1 percent.

Slovak Republic and Slovenia experienced particularly large welfare gains. Since these countries have a "policy-induced" advantage, this comes as no surprise. Third, the data indicate that the welfare gains have been gaining momentum since the beginning of the 1990s, although at an uneven pace. Lastly, the CEECs as a region outperformed all CIS economies, which may be explained by less onerous legacy of distorted development under socialism the CEECs, as well as their geographical proximity to the EU.

4 Conclusions

It is often said that, if there is one thing that all economists agree on, it is the merits of free trade. This belief is supported by an extensive corpus of international trade theory that demonstrates how gains from trade can emerge through a variety of channels.[17] Classical trade theory focuses on the gains from exchange and specialization. Other channels like preference heterogeneity and imperfect competition have become prominent relatively recently. According to the theory, gains from trade can be realized when markets are imperfectly competitive, because opening up to trade increases competition between domestic and foreign firms and thus enforces market discipline. Gains from trade are also realized when consumers have heterogeneous preferences, because trade increases the number of product varieties available. The underlying premise is that there may be fixed costs to importing a variety, and tariffs limit variety by shrinking the market for each good. In other words, increasing-returns-to-scale technologies have the potential to deliver large welfare gains from trade liberalization.

Despite the theory's strong predictions, empirical evidence on the magnitude of variety gains from trade is somewhat limited. In this paper, we have therefore tried to confirm or rebuff this suspicion by analyzing an exceptional case: the evolution of trade in the countries of the former communist bloc after the collapse of the Soviet Union. At a time when the debate on the merits and perils of globalization is heating up, it is important to be able to draw lessons from specific episodes in trade liberalization. Our estimates indicate that trade integration has helped to increase welfare across the Central and East European countries, and, therefore, freer trade has been a blessing.[18]

[17] A Google searching under the keywords "trade & welfare" yields over 1.8 million hits – ample proof that both interest and research abound.

[18] Sweeping general conclusions are obviously difficult, since the countries under consideration represent a unique group in terms of rapid institutional change and substantial economic transformation.

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