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## Comparison of Trade Liberalizations in Russia, China, and India

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### 1. Introduction

The aim of this brief paper is to compare the trade liberalizations executed intensively by the governments of Russia, China, and India in the 1990s.

For this purpose, I firstly glance over the trade liberalization processes in these three countries in the 1990s. Secondly, I make a comparison of the trade openness of the countries in 2000, employing the “outcome-based measure of trade policy” created by Leamer (1988). Thirdly, the results of the analysis are examined in greater detail, making an attempt to assess the trade policies behind them.

### 2. Trade Liberalizations in Russia, China, and India: A Short Summary

Russia, China, and India seem to be common in that a broad trade policy reform was introduced in each country at the beginning of the 1990s. In China, the market-oriented reform has been accelerated since the 3<sup>rd</sup> General Assembly of the 14<sup>th</sup> Communist Party Convention in November 1993 (Sato, 2009). In India, comprehensive reform for liberalization of the economy was initiated in June 1991 (Esho, 2008, pp. 68-122). As for Russia, the presidential decree on November 15, 1991 stipulated the start of drastic import liberalization from the beginning of 1992 (Uegaki, 2005, pp. 15-16).

The components of the trade policy reforms in the three countries were basically similar. Prior to the beginning of the 1990s, direct trade controls by the government, including quotas, licensing, trading rights, etc., were prevalent in each of these countries, and they were dismantled through the reform period. As direct controls were phased out, they developed foreign trade systems relying much more on indirect instruments, such as tariffs and non-tariff measures, except direct controls to regulate the flow of imports and exports.<sup>1</sup> They then reduced the level of tariffs and non-tariff barriers to trade.

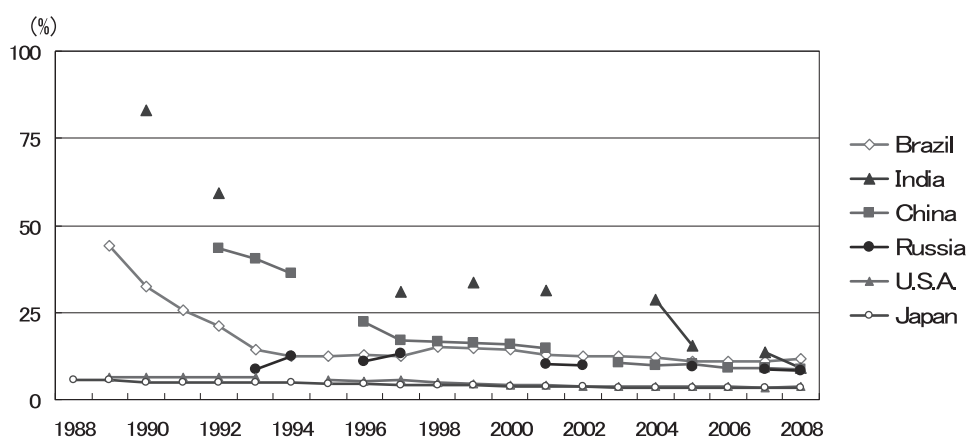
Despite the similarities in the components of the policy measures, the pace of trade liberalizations in the three countries was not uniform, especially in Russia on the one hand and in the other two countries on the other. In India, the number of goods subject to import licensing has decreased since the beginning of the reform, but as of 1 April, 1997, approximately 32% of the total number of goods was subject to licensing, mainly for balance of payments reasons (WTO,

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<sup>1</sup> Non-tariff measures include any kind of trade policy instrument except tariffs: not only direct controls (quotas and licensing), but also standard-certification, sanitary and phytosanitary measures, complicated customs procedures, and so on.

2002, p. 38). In China, at the time of its accession to the WTO (December 2001), both import quotas and licensing were applied to a number of products, including motor vehicles, petroleum products, natural rubber products, cameras, and wrist watches (WTO, 2006, p. 81). Regarding tariffs, the average applied import tariff rate on manufactured goods was 83% in India (1990) and 44% in China (1992) before the beginning of the intensive trade liberalizations, and it took between ten and fifteen years for them to reduce the rate to around 10% (**Figure 1**). On the other hand, Russia drastically eliminated most of its restrictions on foreign trade, especially on the importing side, during the first one to two years of the reform. Its average tariff rate was a mere 8.5% in 1993, which was only slightly higher than the level of U.S. (6.5%) in that year.

**Figure 1: Average Applied Import Tariff Rates**



Note: Simple (unweighted) average of applied most-favored nation rates (MFN rates) on non-agricultural and non-fuel products.

Source: UNCTAD (2009).

Based on these short summaries, the openness of trade regimes as a whole seems to be higher for Russia than for China and India at the beginning of the 2000s, the point of completion of the intensive trade liberalizations of the 1990s. It also coincides with the widely held recognition that Russia was a radical reformer and that China and India were gradual reformers.

However, as some of the several works of literature on international economics suggest, such “incidence-based measures” in the attempt to measure trade openness by direct observation of the policy instruments are generally atheoretic (Pritchett, 1996, pp. 308-309). Certainly, tariff averages have frequently been used to measure the height of trade barriers (or openness) of a country. But a large number of countries, especially the emerging ones including China and India, have frequently provided a wide range of tariff concessions or exemptions on import duty under a number of export-promotion schemes and regional and bilateral agreements, and due to the complexity of the exemptions, it is often impossible to incorporate them into the average tariff rate. In addition to this, the existence of non-tariff barriers (quotas and licensing) makes tariff averages

more doubtful as an overall measure of barriers, because coverage ratios for non-tariff barriers do not necessarily suggest the severity of these barriers, and furthermore, it is unclear how tariff averages and non-tariff coverage ratios should be combined.

### 3. Trade Flow-based Openness Index for Russia, China, and India

Alternative measures of trade openness to “incidence-based” measures are “outcome-based” measures. They assess deviation of the actual outcome from what the outcome would have been without the trade barriers. Outcome measures can be either price based or trade flow based.

In this study, I have taken the trade flow-based approach of Leamer (1988). He creates a measure of openness from the estimation of a modified Heckscher-Ohlin-Vanek (HOV) model of trade flows. Using the data of sixty-six countries in 1982, the model predicts the net exports for each country for each of the commodity groups as a function of the country’s endowments of productive factors. The deviation of the predicted from the actual level of net export is taken as an indicator of trade barriers for each of the commodity groups of a country. And the openness measure for total trade for a country (and the three aggregates of resources, agricultural and manufactured goods) is then computed as the sum of these deviations across all commodities.<sup>2</sup>

### 4. Methodology and Regression Results

The maintained hypothesis of the modified HOV model of Leamer (1988) is that net exports are linear functions of productive factor endowments. In the same manner as Leamer (1988), I conduct an ordinary least squares (OLS) regression analysis to estimate the model.

The regression equation is

$$Y_{ij} = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_m X_{im} + \varepsilon_{ij}$$

where dependent variable  $Y_{ij}$  is the value of net exports of commodity  $j$  by country  $i$ , and  $j$  here is the ten aggregate commodities for each country: petroleum (PETRO), raw materials (MAT), forest products (FOR), tropical agriculture (TROP), animal products (ANL), cereals (CER), labor intensive (LAB), capital intensive (CAP), machinery (MACH), and chemicals (CHEM).<sup>3</sup>

Explanatory variable  $X_{im}$  is the supplied factor of production  $m$  in country  $i$ . Factor of production  $m$  here comprises the types of resources in each country: capital stock (Capital), three types of workers (Labor1, Labor2, and Labor3), three types of land (Land1, Land2, and Land3), and three types of natural resources (Coal, Minerals, and Oil&Gas). Because of data availability,

<sup>2</sup> In this model, trade barriers are implicitly assumed to be (a) the only important omitted variables, and (b) uncorrelated with the included variables, though both of these assumptions are doubtful (Leamer, 1988, pp.148).

<sup>3</sup> Empirical analyses conducted by Leamer (1984) show that the products included in each of the ten aggregate commodities tend to be exported by similar countries in terms of their endowments of different types of labor, land, and natural resources.



especially that of capital stock data comparable for many countries, the variables data used here are basically data of 2000.<sup>4</sup> The number of countries in the sample is seventy-three including Russia, China, and India. The definitions and sources of the variables used in the regression are presented in **Appendix 1-4**.

The regression results are reported in **Table 1**. The goodness of fit of the model is generally high (adjusted  $R^2$  is 0.50-0.92), and the regression results appear generally plausible. The natural resources of Minerals and Oil&Gas positively contribute to the net exports of PETRO and MAT, and Capital and Labor1 (that is, professional/technical workers) negatively contribute to them. One or more of the Land variables positively contributes to the net exports of agricultural goods: TROP, ANL, CER, and FOR. Regarding manufactured goods, the most significant and positive determinants of net export of MACH, CAP, and LAB are Capital, Labor1, and Labor2 (non-professional literate workers), respectively.

## 5. Trade Openness of Russia, China, and India

The measure of trade openness used here is the adjusted trade intensity ratio (TIR). This index for a country is calculated as the sum of absolute value of actual net exports minus the sum of absolute value of predicted net exports for each group of goods. The country-size effect is eliminated by dividing by GDP.

$$TIR_i^A = (\sum |N_{ij}| - \sum |N_{ij}^*|) / GDP_i.$$

Here,  $N_{ij}$  is the actual net exports of commodity  $j$  by country  $i$ , and  $N_{ij}^*$  is the predicted net exports calculated from the regression results above and factor supply in each country.

Prior to calculation of the index, however, we have to consider the significant shortcomings of Russia's foreign trade statistics. The source of Russia's trade statistics used here is the UN Comtrade database, the original source of which is the Federal Customs Service of Russia (FTS). One of the most significant shortcomings of such data is the fact that they do not include "shuttle trade" (informal trading activities by individuals who travel abroad on shopping trips and return to Russia to sell the acquired foreign goods), which has amounted to more than one quarter of Russia's imports in recent years.<sup>5</sup> Another significant shortcoming is that all of Russia's trade transactions with Belarus are classified into the group of "special transactions or not classified elsewhere," namely, the SITC-93 group that forms a part of LAB (labor-intensive trade). Taking these shortcomings into consideration, I revised the values of actual net exports

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<sup>4</sup> As much of the literature indicates, one of the least available data for many countries is appropriate capital stock data. In this study, I used the "capital + urban land" values per capita in 2000 published by the World Bank (2006).

<sup>5</sup> For 2000, Russia's goods imports amounted to 33,880 million USD according to the FTS and UN Comtrade, but the balance of payment statistics published by the Central Bank of Russia (CBR) report the value to be 44,862 million USD, i.e., 24.5% of Russia's imports was not covered by the statistics of FTS or UN Comtrade.

**Table 2: Trade Openness Index**

Rank	Country	Resources	Agricultural goods	Manufactured goods	Total
1	Ireland	0.01	0.02	0.26	0.29
5	Finland	0.00	0.09	0.01	0.10
18	Germany	▲ 0.01	▲ 0.00	0.03	0.03
23	United States	0.00	0.00	0.01	0.01
24	Japan	▲ 0.00	0.00	0.01	0.01
25	China	▲ 0.00	▲ 0.00	0.00	0.00
27	France	▲ 0.00	0.00	▲ 0.01	▲ 0.01
32	India	▲ 0.01	▲ 0.00	▲ 0.02	▲ 0.03
34	Turkey	▲ 0.03	▲ 0.01	▲ 0.02	▲ 0.06
37	Indonesia	▲ 0.02	0.01	▲ 0.10	▲ 0.11
43	Brazil	▲ 0.01	▲ 0.00	▲ 0.13	▲ 0.15
45	Russian Federation	0.04	▲ 0.02	▲ 0.21	▲ 0.19
47	Egypt	▲ 0.05	▲ 0.01	▲ 0.18	▲ 0.25
58	Bulgaria	▲ 0.21	▲ 0.20	▲ 0.45	▲ 0.86
60	Georgia	▲ 0.22	▲ 0.52	▲ 0.66	▲ 1.40
64	Ethiopia	▲ 0.52	▲ 0.24	▲ 2.25	▲ 3.00
70	Moldova, Republic of	▲ 1.07	▲ 1.50	▲ 3.56	▲ 6.12
73	Dominica	▲ 2.15	▲ 5.14	▲ 8.05	▲ 15.34

Source: Author's estimation.

for Russia (**Table 3**).<sup>6</sup>

A short list of the trade openness index for some countries, including Russia, China, and India, is provided in **Table 2**.<sup>7</sup> From the table, we can find that the trade openness of China is as high as those of some developed countries like the U.S and Japan. India's trade openness is inferior to that of China to some extent. Russia occupies a subordinate position not only to China and India, but also to other several emerging economies (the rank is forty-five out of seventy-three), which indicates that the country's trade regime was relatively closed among countries all over the world.

## 6. Discussion of "Openness" and the Trade Policies Behind It

This section of the paper examines the results of the analysis above in greater detail, making an attempt to assess the trade policies behind them.

**Table 3** shows actual and predicted net exports of each group of commodities and their

<sup>6</sup> The revision was made in the following simple way: firstly, import values of each group of commodities are multiplied by the coefficient of 1.32 (= 1/(1-0.245)), and then all of Russia's trade values with Belarus are subtracted from LAB.

<sup>7</sup> The full list of the openness index for seventy-three countries of the world is reported in **Appendix 4**.

**Table 3: Actual and Predicted Net Exports of Russia, China, and India (Percent of GDP)**

	Russian Federation				China			India		
	Actual [A]	Actual* [A*]	Predicted [P]	A*-P	[A]	[P]	A-P	[A]	[P]	A-P
PETRO	12.97	12.87	9.09	3.77	▲ 1.19	▲ 1.28	0.08	▲ 3.40	▲ 4.22	0.83
MAT	9.80	9.59	9.18	0.41	▲ 0.54	▲ 0.57	0.03	▲ 0.54	▲ 0.55	0.01
FOR	1.18	1.07	3.00	▲ 1.93	▲ 0.56	▲ 0.60	0.04	▲ 0.21	▲ 0.11	▲ 0.10
TROP	▲ 1.02	▲ 1.41	▲ 0.94	▲ 0.48	0.20	0.22	▲ 0.02	0.22	0.29	▲ 0.08
ANL	▲ 0.38	▲ 0.58	1.05	▲ 1.63	0.29	0.29	▲ 0.00	0.39	0.49	▲ 0.10
CER	▲ 0.81	▲ 1.14	1.40	▲ 2.55	▲ 0.34	▲ 0.34	0.00	▲ 0.04	0.17	▲ 0.21
LAB	2.98	1.55	▲ 5.55	7.11	6.26	6.09	0.17	1.98	1.40	0.58
CAP	2.13	1.77	▲ 1.17	2.94	0.50	0.52	▲ 0.02	1.49	1.03	0.45
MACH	▲ 0.89	▲ 2.06	▲ 19.51	17.45	▲ 1.06	▲ 1.02	▲ 0.04	▲ 1.13	▲ 3.99	2.87
CHEM	0.51	▲ 0.10	▲ 0.44	0.34	▲ 1.55	▲ 1.52	▲ 0.03	▲ 0.15	▲ 0.61	0.46
Total	26.48	21.54	▲ 3.90	25.44	2.01	1.80	0.21	▲ 1.39	▲ 6.10	4.72

Note: \* denotes revised actual net exports of Russia.

Source: UN Comtrade, CBR, and author's estimation from the regression results.

differences for Russia, China, and India.<sup>8</sup> The idea is that the differences between the actual and the predicted net exports of each group of goods can be explained by the government's policies toward the goods as a mixture of import-detering and export-promoting measures. For example, if the actual net exports of a certain group of goods are much larger than predicted, the government may be implementing policies that aim to reduce imports and/or promote exports of goods.

### China

Regarding China, it is striking that the differences between the actual and the predicted level of net export are fairly small for every group of commodities, indicating that China's trade flows are basically founded on its factor endowments. The largest deviation is observed with the labor-intensive commodities, whose exports demonstrated spectacular growth in the 1990s. But the value of actual net exports of labor-intensive goods exceeds the predicted net exports only by 0.2 percentage points of the GDP. These findings suggest that China's foreign trade policies are very "liberal" as a whole, and that their distortion effect on its trade flows is minimal. Practical policy measures that greatly contributed to this liberality seem to be the import duty exemption scheme for the processing trade and other import tariff concessions. For this, a fact providing some support is that the share of imports exploiting the duty exemption scheme for the processing trade amounted to 42% of the total import in 2001 (Li and Ye, 2011, p. 14).

<sup>8</sup> Please note that these are not differences in the absolute values used in calculating the adjusted trade intensity ratio. The presumption made in calling the adjusted trade intensity ratio a measure of openness is that the direction (positive or negative) of predicted and actual net export of a certain group of goods must be the same, but there are actually several cases refuting this presumption, such as India's CER trade and Russia's ANL, CER, LAB, and CAP trade, reported in **Table 3**.

## India

Concerning India's actual and predicted net exports, we can find two features: actual net exports are slightly lower than those predicted for all agricultural trade on the one hand, and on the other hand, for the other groups of goods, especially for manufactured products, actual net exports are larger than those predicted by 0.5-2.9 points of the GDP.

As a reason behind this feature of agricultural trade, I assume that India's traditional "self-sufficiency" policy toward this sector played a large role. Agricultural products as a whole have been an important contributor to the country's exports (14% in 2000/01), but export controls with tariffs and non-tariff barriers (i.e., quotas and licensing) have been used in the policy framework to ensure that domestic demands are met largely by domestic supplies (WTO, 2002, p. 98).<sup>9</sup>

The other feature, that the actual net exports are larger than those predicted for manufactured goods, can be explained by the remaining high barriers on imports. Notwithstanding the intensive trade liberalizations in the 1990s, the overall simple average tariff for manufactured products was 32.5% in 2000/01. Textiles and clothing, an important source of foreign export earnings (nearly 30% of the total export in 1999/00), was also an industry highly protected both by tariff and non-tariff barriers by the beginning of the 2000s.<sup>10</sup>

## Russia

In Russia, we see that actual net exports are larger than those predicted for resources and manufacturing trade, and vice versa for agricultural goods. These tendencies themselves are very similar to India's, but Russia's peculiarity lies in the fact that the differences between actual and predicted net exports are tremendously large, especially for trades of PETRO, MACH, and LAB. It is difficult for us to find policy measures on PETRO explaining such large difference.<sup>11</sup> It is conceivable that not policy measures, but the oil price hike on international markets in the year may be responsible for the difference.

In the manufacturing trade, the fact that actual net exports far exceed those predicted could be partly explained by two factors. Firstly, it is widely known that Russia's customs practice and procedure are greatly complicated, and this may act as a serious non-tariff barrier to trade, especially to imports.<sup>12</sup> Secondly, special institutional relations with other CIS countries, such as

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<sup>9</sup> India's agricultural exports face also a lack of adequate post-harvest infrastructure like refrigerated transport, storage, and adequate facilities at airports, seaports, etc. (WTO, 2002, p. 103).

<sup>10</sup> The Indian Government provided concessions or exemptions on import duty under a number of export-promotion schemes like China. However, in marked contrast to China, no evidence has been found that the exemptions have increased exports in the sectors they have targeted. Data provided by the authorities show that the share of exports qualifying for these schemes as a share of total exports has risen steadily, but the share of India's exports to the GDP themselves remained rather stable (WTO, 2002, p. 55).

<sup>11</sup> The government's principal policy measures on the oil and gas trade have been export duties since 1999, which should theoretically have export-deterring effect on PETRO.

<sup>12</sup> According to the World Bank (2011), Russia's ranking on ease of "Trading Across Borders," which is judged from the number of documents, time, and cost to trade, is 160<sup>th</sup> (out of 183 countries), while the ranking of China and India is 60<sup>th</sup> and 109<sup>th</sup>, respectively.



bilateral free trade agreements (FTA) stipulating a duty-free trade regime since the middle of the 1990s, similarities in the standard certification system (GOST), etc., seem to play an export-promoting role for Russia's manufactured goods.<sup>13</sup>

## 7. Conclusion

We may summarize the conclusions obtained from the analyses as follows.

1. Based on the average import tariff rate and the coverage ratios for non-tariff barriers (quotas and licensing), the openness of the trade regime as a whole seems to be higher for Russia than for China and India in 2000.
2. However, according to the "trade flow-based openness index" created by Leamer (1988), it is found that the trade openness of China was as high as those of some developed countries for the year. India's trade openness was inferior to that of China to some extent. Russia occupies a subordinate position not only to China and India, but also to other many emerging economies.
3. Practical policy measures that greatly contributed to such differences in trade openness are, it seems, (a) the import duty exemption scheme for the processing trade in China, (b) the "self-sufficiency" policy toward the agricultural sector and remaining high barriers on the manufactured imports in India, and (c) the very complicated customs procedures and the special institutional relations with other CIS countries, such as bilateral free trade agreements and similarities in the standard certification system (GOST), in Russia.

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<sup>13</sup> Several manufactured goods such as machines, electrical equipment, ships, and optical apparatus (these are the 84, 85, 89, 90 groups, respectively, by the two-digit Harmonized System) are found to have comparative advantages in the CIS markets in 1994 and 2005 (Konno, 2008).

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## Appendix 1: Countries in the sample

1 Algeria	16 Costa Rica	31 Guyana	46 Moldova, Republic of	61 Spain
2 Antigua and Barbuda	17 Denmark	32 Honduras	47 Namibia	62 Suriname
3 Argentina	18 Dominica	33 Hungary	48 Nepal	63 Sweden
4 Australia	19 Dominican Republic	34 India	49 Netherlands	64 Switzerland
5 Austria	20 Ecuador	35 Indonesia	50 New Zealand	65 Syrian Arab Republic
6 Bangladesh	21 Egypt	36 Ireland	51 Norway	66 Thailand
7 Belgium	22 El Salvador	37 Israel	52 Pakistan	67 Trinidad and Tobago
8 Bolivia	23 Estonia	38 Italy	53 Panama	68 Turkey
9 Botswana	24 Ethiopia	39 Japan	54 Peru	69 United Kingdom
10 Brazil	25 Finland	40 Korea, Republic of	55 Philippines	70 United States
11 Bulgaria	26 France	41 Latvia	56 Romania	71 Uruguay
12 Canada	27 Georgia	42 Lesotho	57 Russian Federation	72 Venezuela, Bolivarian Rep. of
13 Chile	28 Germany	43 Malaysia	58 Saint Lucia	73 Zambia
14 China	29 Greece	44 Mauritius	59 Singapore	
15 Colombia	30 Grenada	45 Mexico	60 South Africa	

**Appendix 2: Description of 10 aggregate commodities**

	SITC	Description	SITC	Description
Petroleum (PETRO)	33	Petroleum and petroleum products		
Raw materials (MAT)	27	Crude fertilizers and crude minerals, nes	34	Gas, natural and manufactured
	28	Metalliferous ores and metal scrap	35	Electric energy
	32	Coal, coke, and briquettes	68	Non-ferrous metals
Forest products (FOR)	24	Wood, lumber, and cork	63	Wood and cork products excluding furniture
	25	Pulp and paper	64	Paper, paperboard, and products thereof
Tropical agriculture (TROP)	05	Fruit and vegetables	11	Beverages
	06	Sugar, sugar preparations, and honey	23	Crude rubber including synthetic and reclaimed
	07	Coffee, tea, cocoa, spices & products thereof		
Animal products (ANI)	00	Live animals	21	Hides, skins and fur skins, undressed
	01	Meat and meat preparations	29	Crude animal and vegetable materials, nes
	02	Dairy products and eggs	43	Animal and vegetable oils and fats, processed
	03	Fish and fish preparations	94	Animals, nes, incl. zoo animals, dogs, and cats
Cereals, etc. (CER)	04	Cereals and cereal preparations	22	Oil seeds, oil nuts, and oil kernels
	08	Feed stuff for animals excl. unmilled cereals	26	Textile fibers, not manufactured, and waste
	09	Miscellaneous food preparations	41	Animal oils and fats
	12	Tobacco and tobacco products	42	Fixed vegetable oils and fats
Labor intensive (LAB)	66	Non-metallic mineral products, nes	89	Miscellaneous manufactured articles, nes
	82	Furniture	91	Postal packages not class. According to kind
	83	Travel goods, handbags, and similar articles	93	Special transact. not class. According to kind
	84	Clothing	96	Coin, other than gold coin, not legal tender
	85	Footwear		
Capital intensive (CAP)	61	Leather, lthr. products, nes & dressed fur skins	67	Iron and steel
	62	Rubber products, nes	69	Products of metal, nes
	65	Textile yarn, fabrics, made-up articles, etc.	81	Sanitary, plumbing, heating, and lighting fixt.
Machinery (MACH)	71	Machinery, other than electric	86	Scientif & control instrum, photogr gds, clocks
	72	Electrical machinery, apparatus, and appliances	95	Firearms of war and ammunition therefor
	73	Transport equipment		
Chemicals (CHEM)	51	Chemical elements, and compounds	56	Fertilizers, manufactured
	52	Crude chemicals from coal, petroleum, and gas	57	Explosives and pyrotechnic products
	53	Dyeing, tanning, and coloring materials	58	Plastic materials, etc.
	54	Medicinal and pharmaceutical products	59	Chemical materials and products, nes
	55	Perfume materials, toilet, and cleansing preparations		

Source: Leamer, Edward E. (1984).

**Appendix 3: Definitions and sources of the variables**

	Definition	Unit	Source
Net exports		1,000 USD	UN Comtrade
Capital	"capital + urban land" values	Million USD	World Bank (2006)
Labor 1 (professional/technical workers)	Number of professional/technical workers as a percentage × Economically active population	1,000	ILO (2011)
Labor 2 (nonprofessional literate)	Economically active population – Labor1 – Labor3		ILO (2011), UNESCO (2011), Rapid Intelligence (2011)
Labor 3 (nonprofessional illiterate)	Illiteracy rate × Economically active population		
Land 1	Arable land	1,000 ha	FAO (2011)
Land 2	Permanent meadows and pastures		
Land 3	Forest area		
Minerals	Production of minerals (bauxite, copper, fluor, iron ore, lead, manganese, nickel, phosphate, potash, salt, tin, zinc)	1,000 USD	British Geological Survey (2006), USGS (2011)
Coal	Production of coal		British Geological Survey (2006), British Petroleum (2011)
Oil & Gas	Production of crude petroleum and natural gas		
GDP		Millions USD	IMF (2011)

**Appendix 4: Full list of the openness index for 73 countries**

	Resources	Agricultural goods	Manufactured goods	Total
1 Ireland	0.01	0.02	0.26	0.29
2 New Zealand	0.02	0.11	0.10	0.23
3 Singapore	0.05	0.01	0.12	0.17
4 Malaysia	▲ 0.03	0.03	0.11	0.11
5 Finland	0.00	0.09	0.01	0.10
6 Korea, Republic of	0.05	0.01	0.05	0.10
7 Denmark	0.00	0.04	0.04	0.08
8 Pakistan	0.03	▲ 0.02	0.06	0.07
9 Belgium	0.01	0.01	0.04	0.06
10 Sweden	0.00	0.04	0.01	0.05
11 Canada	0.02	0.03	0.00	0.05
12 Spain	▲ 0.00	0.01	0.03	0.04
13 Netherlands	0.01	0.03	0.00	0.04
14 Mexico	▲ 0.00	0.01	0.03	0.04
15 Switzerland	▲ 0.01	0.01	0.03	0.03
16 Italy	0.00	0.01	0.01	0.03
17 Norway	0.07	0.01	▲ 0.04	0.03
18 Germany	▲ 0.01	▲ 0.00	0.03	0.03
19 Philippines	0.01	▲ 0.01	0.02	0.02
20 Israel	0.01	0.00	0.00	0.02
21 United Kingdom	▲ 0.00	0.00	0.01	0.02
22 Austria	▲ 0.00	0.01	0.01	0.01
23 United States	0.00	0.00	0.01	0.01

Comparison of Trade Liberalizations in Russia, China, and India

24	Japan	▲ 0.00	0.00	0.01	0.01
25	China	▲ 0.00	▲ 0.00	0.00	0.00
26	Colombia	▲ 0.02	0.01	▲ 0.01	▲ 0.01
27	France	▲ 0.00	0.00	▲ 0.01	▲ 0.01
28	Dominican Republic	0.00	▲ 0.05	0.03	▲ 0.02
29	Thailand	▲ 0.01	0.04	▲ 0.04	▲ 0.02
30	Greece	▲ 0.03	▲ 0.01	0.01	▲ 0.03
31	Ecuador	▲ 0.00	0.03	▲ 0.06	▲ 0.03
32	India	▲ 0.01	▲ 0.00	▲ 0.02	▲ 0.03
33	Costa Rica	▲ 0.00	0.00	▲ 0.05	▲ 0.05
34	Turkey	▲ 0.03	▲ 0.01	▲ 0.02	▲ 0.06
35	Argentina	0.01	▲ 0.01	▲ 0.11	▲ 0.11
36	Panama	▲ 0.01	▲ 0.09	▲ 0.01	▲ 0.11
37	Indonesia	▲ 0.02	0.01	▲ 0.10	▲ 0.11
38	Algeria	0.13	▲ 0.00	▲ 0.25	▲ 0.12
39	Venezuela, Bolivarian Rep. of	▲ 0.03	▲ 0.01	▲ 0.09	▲ 0.13
40	Hungary	▲ 0.06	▲ 0.02	▲ 0.06	▲ 0.14
41	El Salvador	▲ 0.02	▲ 0.07	▲ 0.05	▲ 0.14
42	Uruguay	▲ 0.00	▲ 0.02	▲ 0.12	▲ 0.14
43	Brazil	▲ 0.01	▲ 0.00	▲ 0.13	▲ 0.15
44	Australia	▲ 0.00	▲ 0.02	▲ 0.15	▲ 0.17
45	Russian Federation	0.04	▲ 0.02	▲ 0.21	▲ 0.19
46	Chile	▲ 0.05	▲ 0.11	▲ 0.05	▲ 0.21
47	Egypt	▲ 0.05	▲ 0.01	▲ 0.18	▲ 0.25
48	Honduras	▲ 0.06	▲ 0.12	▲ 0.19	▲ 0.37
49	Latvia	▲ 0.11	▲ 0.10	▲ 0.16	▲ 0.37
50	Peru	▲ 0.04	▲ 0.08	▲ 0.26	▲ 0.38
51	Trinidad and Tobago	0.03	▲ 0.17	▲ 0.25	▲ 0.38
52	Romania	▲ 0.13	▲ 0.07	▲ 0.22	▲ 0.42
53	Syrian Arab Republic	0.04	▲ 0.06	▲ 0.43	▲ 0.45
54	Mauritius	▲ 0.08	▲ 0.27	▲ 0.13	▲ 0.48
55	South Africa	▲ 0.08	▲ 0.07	▲ 0.34	▲ 0.49
56	Estonia	▲ 0.15	▲ 0.19	▲ 0.26	▲ 0.61
57	Botswana	▲ 0.26	▲ 0.14	▲ 0.22	▲ 0.62
58	Bulgaria	▲ 0.21	▲ 0.20	▲ 0.45	▲ 0.86
59	Bangladesh	▲ 0.20	▲ 0.14	▲ 0.98	▲ 1.33
60	Georgia	▲ 0.22	▲ 0.52	▲ 0.66	▲ 1.40
61	Namibia	▲ 0.45	▲ 0.39	▲ 0.59	▲ 1.42
62	Nepal	▲ 0.13	▲ 0.20	▲ 1.54	▲ 1.87
63	Bolivia	▲ 0.33	▲ 0.16	▲ 1.48	▲ 1.97
64	Ethiopia	▲ 0.52	▲ 0.24	▲ 2.25	▲ 3.00
65	Zambia	▲ 0.44	▲ 0.38	▲ 3.06	▲ 3.88
66	Guyana	▲ 0.48	▲ 1.57	▲ 2.28	▲ 4.34
67	Suriname	▲ 0.63	▲ 2.00	▲ 3.03	▲ 5.67
68	Antigua and Barbuda	▲ 0.82	▲ 2.01	▲ 3.12	▲ 5.95
69	Lesotho	▲ 0.61	▲ 1.94	▲ 3.42	▲ 5.98
70	Moldova, Republic of	▲ 1.07	▲ 1.50	▲ 3.56	▲ 6.12
71	Saint Lucia	▲ 0.93	▲ 2.24	▲ 3.41	▲ 6.58
72	Grenada	▲ 1.32	▲ 3.20	▲ 4.95	▲ 9.47
73	Dominica	▲ 2.15	▲ 5.14	▲ 8.05	▲ 15.34

Source: Author's estimation.