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The Appropriateness of Trade Liberalization in the Industrial Sector of the Russian Federation

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Abstract

This article seeks to investigate the appropriateness of implementation of trade liberalization in Russia by analyzing the current performance of the Russian industrial sector and evaluating its nominal and effective protection levels. The estimation of the effective level of protection is performed through the calculation of effective rates of protection for each industrial sector. Effective rates of protection are estimated with the simple Corden Method to examine the difference in protective levels for industry as a whole, raw materials, semi-finished products and for finished products intended predominantly for consumer needs in each industrial sector.

The results of the analysis find that the system of protection in the industrial sector of the Russian Federation has been built without taking into consideration the possibilities of development of comparative advantage. Protection is predominantly granted reasoning from revenue consideration and lobbing interests, but not the economic efficiency.

This study concludes that there is urgent necessity for the Russian government to clearly identify the industrial sectors, which need protection, taking into account their perspective on comparative advantage; and accordingly, to reconsider its tariff policy. Designing Russia's tariff policies in compliance with the potential comparative advantage can provide considerable welfare gains to the economy and help to establish a more efficient economic structure.

Introduction

After the dissolution of the Soviet Union, the Russian government declared that integration into the world economy would be one of its highest priority directives of the state economic policy. During the past eleven years, Russia made efforts to access as many international economic organizations as possible. At the present moment Russia is a member of the International Monetary Fund（IMF), the Asia-Pacific Economic Forum（APEC), the European Council, the Commonwealth of the Independent States（CIS), Eurasian Economic Association, and has attempted to enter the World Trade Organization（WTO）since 1995.

Such policies by the government, especially the ongoing attempts to gain access to the WTO, have caused numerous discussions about the appropriateness of implementation of trade liberalization in Russia and its possible impacts on the further development of the industrial sector.

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It is well known that trade liberalization can have both positive and negative effects upon the economic development of a country. Though liberalization can lead to a more effective allocation of resources and contribute to the establishment of a more productive economic structure; nevertheless, if "introduced in total disregard of a country's possibilities, the result can be counterproductive".[1]

The purpose in writing this article is to evaluate the appropriateness of trade liberalization in Russia, taking into account the current performance of the industrial sector, and to consider suitable policies for implementation. The first section of this article addresses the industrial and trade policies being applied in the Russian Federation, describes current performance of different industrial sectors, and analyzes their nominal protection level. The second section focuses on the evaluation of the level of the effective protection in the Russian industry through the analysis of the effective rates of protection. The third section makes an appraisal of the existing tariff policies in Russia on the basis of the analysis conducted in previous sections, and considers the appropriateness of implementation of trade liberalization in each of the studied industrial sectors. The forth section contains the conclusions.

Since the development of export-oriented and import-competing industries requires different industrial and trade policies, and the impact of trade liberalization on them will be different, this study divided all of Russia's industrial sectors into two large groups: (i) industries with relatively high export potential, and (ii) mainly import-competing industries. The main criterion for placing an industry into a respective group depended on the particular industry's export share in its total production. The first group consists of industries in which shares of export in production on average exceeded 25% during 1995-1999.[2] These industries were represent by: ferrous metallurgy (share of export in production equaled 38.32% on average), non-ferrous metallurgy (56.44%), fuel industries (31.47%), chemical and petrochemical industry (29.02%), wood-processing, pulp and paper industry (26.67%), and the electric power industry. Despite the relatively small export share of the electric power industry in total production (only 1.59% on average), this industry was also included into this group because it satisfies almost all domestic demand for the industry's production, and it maintains high potential in increasing its export capability in the future due to an abundance of resources in the economy. The remaining industries, namely the machine-building and metal-processing industry (18.23%), building materials industry (2.21%), light industry (11.63%), and food industry (4.51%) were included in the second group.

1. The Industrial and Trade Policies Directed at Further Development of the Russian Industry, and its Current Performance

1.1. Russia's Industrial Policy

The industrial sector of the Russian Federation is characterized by the large share of extracting industries found in total industrial output. From the very beginning of market reforms, the main goals of a majority of the implemented programs aimed at the development of industrial sector have been

the diversification of production, an increase in the share of high value-added products in total industrial production and exports, and the improvement of competitiveness of Russian products in the domestic and world markets.

According to the program "Conception of Industrial Policy with Export Orientation for the Period until 2005,"[3] the highest priority in industrial development is given to such industries as the aircraft, space, nuclear, defense, and biotechnology. The final products from these industries is supposed to become the base of Russian exports in the future.

It has been pointed out in the program that the expansion of the export base by the extracting industries is appropriate only during a short-run period after overcoming an economic crisis, to accumulate currency reserves, reduce external debt, or provide monetary reserves for imports. Later, policy efforts must concentrate on industrial growth in the processing industries in order to achieve an increase in the competitiveness of domestic production on the world market and the growth of exportations.

The Conception of Industrial Policy indicates that there also exists a necessity to develop production in the light and food industries, medical industry, and some sectors of the machine-building industry (automotive, electronic, ship-building, etc.). At the present moment these industries are characterized by relatively low competitiveness but have a potential to become competitive in the domestic market.

Related to such concerns the government developed the following methods for supporting industries:

- imposition of import tariffs;
- provision of the preferential regime for import of technologies and equipment used in the production process;
- purchasing predominantly domestic products for the state needs;
- assistance to enterprises in establishing trading network;
- development of leasing system; and
- establishment of favorable conditions for the attraction of foreign investments.

However, as stressed by Kuznetsov (2002), this program, as in all other development programs in Russia determining industrial policy after dissolution of the Soviet Union, lacks the detailed description of the specified measures for the policy's implementation. The researchers at the Institute of World Economy and International Relations (2002) pointed out that although the Russian government declared that the main targets of the reforms in the industrial sector were the reduction of the dependency of the economy on the production of primary commodities and the significant increase in the share of production with high value-added, it failed to develop an industrial policy that actually encouraged the increase in competitiveness of Russian commodities with relatively high value-added. Salnikov and Galimov[4] noted that;

the medium-range strategy of economic development must be supplemented with task-oriented measures of structural and investment policy in the industry. It is necessary to define beforehand the structural constraints... and develop measures of their overcoming. It is important to provide mutual coordination of industrial programs. The economic effects of their implementation must be substantiated to further stimulate the balanced growth of the economy.

1.2. Current Performance of the Russian Industrial Sector

After nearly a decade of deep economic recession, the Russian economy has started to recover again in 1999. During this period, industrial production dropped by more than 50%[5] in 1998 compared to the 1991 average and even greater in several other industrial sectors (87.3% in light industry, 69.4% in building materials industry and 63.9% in machine-building and metal processing industry). Recent growth rates of industrial production increased 11, 12 and 5% respectively in 1999, 2000 and 2001. It should also be noted that industrial growth in most processing industries was higher than in the extracting industries.

1.2.1. Performance of Industries with Relatively High Export Potential

The types of companies included in the group of industries with relatively high export potential produced approximately 57.32% of the total industrial output of the economy and accounted for 73.37% of total export.[6] Among them, fuel industries have the largest share in both total industrial output and export (18.81% and 22.4% respectively in 1999), being followed by non-ferrous metallurgy (11.95% and 23.73% respectively). The output of these industries consisted predominantly of primary commodities and products with low degree of processing.

During the economic recession, the production decline in the industries of this group remained much lower than in the processing industries, which comprised the group of mainly import-competing industries. The reason for this was that they were partly able to compensate by export expansion the sharp reduction in the domestic demand for their production, caused largely by the decline in the processing industries, especially machine building and metal processing industry. By the end of 2001, most of them returned to their 1993-1994 production levels, with the exception of the electric power industry in which the industrial growth rates stayed relatively low during 1999-2001.

The electric power industry almost completely satisfies the domestic demand (more than 98.5%).[7] The contribution from the production of fuel industries, ferrous and non-ferrous metallurgy and timber, woodworking, pulp and paper industry (hereafter wood industry) in meeting the domestic market demand was also considerably high, reaching 90% in fuel industries, 82.74% in non-ferrous metallurgy, 81.05% in wood industry, and 78.52% in ferrous metallurgy. Chemical and petrochemical industry (hereafter chemical industry) supplied 68.42% of domestically consumed products of the industry. This industry substantially increased its share in the domestic market after the 1998

devaluation of the ruble.

In 2001, fuel industries and non-ferrous metallurgy recorded considerably high levels of profitability (35.9% and 34.4% respectively);[8] however, their profits, as well as profits of ferrous metallurgy and wood industry, were highly dependent on changes in international prices for their production.

Industries with relatively high export potential employed relatively small numbers of laborers (36.9% of total labor force in industry in 2001)[9] compared with the group of import-competing industries.

Most industries in this group were characterized by extremely high levels of production concentration, except for the chemical industry. The share of the eight largest enterprises in the industries' total production was 38.7% for the fuel industry, 53.9% in ferrous metallurgy, 42.2% in non-ferrous metallurgy, 28.6% in electric power industry, and 26.3% in wood industry.[10] Electric power industry and fuel industries are natural monopolies with high share of state participation in fixed capital. The government regulates most prices of energy products, which are set on a level much lower than the market one.

1.2.2. Mainly Import-Competing Industries

All industries included in the group of mainly import-competing industries make-up the processing ones. They account for 42.68% of Russia's total industrial production and 22.63% of total industrial export. Among industries of this group, food industry has the largest share in Russia's total industrial production (17.4%), being followed by the machine-building industry (17.1%). The shares of production of the building materials industry and light industry are extremely small (2.95% and 2.1% respectively).

During the period of economic recession, the industrial decline in the industries of this group remained extremely significant. In 1998, the production in the food industry dropped by more than twice compared to 1991. The machine-building and metal processing industry (hereafter combined as machine-building industry) produced only 36.1% of its 1991 level. Production levels in the light industry dropped by approximately 8 times and in the building materials industry by more than 3 times, respectively. Such sharp declines in the volume of industrial production of processing industries oriented on domestic market can be explained by an inability of domestic producers to compete with imported products after the trade liberalization of 1992 and due to insufficient quality of the produced commodities and high production costs. However, as a result of the ruble devaluation in 1998, which considerably increased the ruble prices for imported products and thus caused significant decline in demand for imports, the Russian producers of the processed products managed to substantially increase their production through the employment of out-of-use capacities in the production process and import substitution. Among industries of this group, the building materials industry and the food industry occupied the largest shares of the domestic market (85.20% and 79.48%, respectively, in

1999).[11] They were followed by the machine-building industry (68.2%) and light industry, which increased its share on the domestic market from only 20.02% in 1998 to 54.72% in 1999.

Industries of this group of mainly import-competing industries were characterized by a relatively low level of production concentration. The eight largest enterprises of each industry produced approximately only 10% of the industry's total production on average, except for the machine building and metal processing industry, where this indicator was twice as high.[12]

It should be noted that the level of profitability in these industries was much lower than in industries with high export potential. The largest level of profitability of 13.6% was recorded in the machine-building industry (2001), being followed by food industry (11.5%) and building materials industry (9.8%), while the light industries had the lowest level of profitability (5.4%).[13]

Another important feature in this particular group of industries is that they account for a substantial share of industrial labor force (more than 63%). Among them the machine-building industry has the largest share (35% in 2001). Food industry, light industry and building materials industry account for 11.2%, 6.1%, and 5.1%, respectively.

One of the most serious problems in the development of all Russia's industrial sectors was due to the lack of investments. Most of the equipment being used in the production process was out of date; in 2001 the average age of all equipment used in the industrial sector was 19.4 years.[14] Investments in the industrial sector were unevenly distributed; for example, import-competing industries received only 18.4%[15] of total investment, while the rest was directed into the extracting industries, predominantly the fuel industries (52% of total industrial investments in 2001). Among import-competing industries, only the food industry and the machine-building industry received a relatively high share of investments (7.5% and 6.9%).

1.3. Protection of the Industrial Sector from Foreign Competition

1.3.1.Main Methods of Industrial Protection

One of the main methods of protection of the industrial sector from foreign competition in the Russian Federation has been the imposition of import tariffs. According to the Federal Law on State Regulation of Foreign Trade Activities and the Customs Code, exports from and imports to Russia are not subject to quantitative restrictions; however, quotas can be introduced in some exceptional cases. Usage of licenses is also limited. At the present moment, such licensing cover dual-use and military goods, medicines, hazardous industrial wastes, rare animals and plants, ozone depleting substances, and nuclear materials. The use of methods of external trade control other than tariffs, quotas, and licenses is prohibited by the law. The export of some so-called strategically important raw materials including; precious metals and stones, equipment and know-how that can be used for the creation of nuclear and other weapons, has been conducted under the system of export controls. All imported goods must meet corresponding standards and requirements. They are also subject to value-added

tax and excise taxes.

Import tariffs are predominantly ad valorem, but in some cases specific rates can be used to prevent a declaration of artificially lowered customs value. In some cases the government can introduce seasonal tariffs, which are valid only for a period not longer than six months. In addition, to protect the national economy the government can temporarily introduce special anti-dumping and countervailing tariffs.

In 1999, the government introduced export tariffs on some raw materials to increase state revenues, and, as officials stated, to eliminate the disparities between domestic and world prices. Initially export duties were expected to be valid no longer than 6 months, yet most of them still remain in effect.

1.3.2. Analysis of the Nominal Level of Protection in Different Industrial Sectors

Most of the studies related to the evaluation of Russia's external trade policies and their influence on industrial sectors, analyze the nominal level of protection of different industrial sectors using simple average or weighted average tariff rates, which are calculated on the basis of the trade statistics by the Customs Committee of the Russian Federation. However, the Customs Committee's Harmonized System (HS) classification is considerably different from State Statistical Committee's industry classification being used for industrial statistics, thus making it impossible to match trade and industrial data. Bessonova et al (2002) used the firm-level data on the physical volumes and values of production and constructed the correspondence code between domestic production and HS classifications for each good. Their method can further be elaborated by construction a conversion table (see Appendix 1). in which all commodities codes of HS classification are re-aggregated according to the industry classification. Data included in each classification group have been further divided into several subgroups; namely, finished products (these are products used mainly for consumers' needs), semi-finished products (this group also includes finished products produced by the industry, which usually can be used in subsequent production process in the same or other industries), and raw materials. Products of machine-building industry have been divided into four groups: consumer goods, semi-finished products and parts, instruments and equipment, and means of transport. This allows us to analyze the degree of industrial protection at various stages of the production process.

Next, the weighted average import tariff rates were calculated for all groups of the conversion table by using the following equation:

$$t_j = \frac{\sum pc_k t_k^n}{\sum pc_k}, \text{ where}$$

pc_k = customs value of products (k) included in group j;

t_k^n = nominal tariff rates on products *k*.

A weighted-average for import tariff rates has been calculated taking into account only imports from the non-CIS's economies, because the imports from such economies are not subject to tariff imposition in the Russian Federation. Therefore, presumably, the decline in nominal tariff rates will not cause significant changes in imports from these economies or at least will not lead to an increase in imports from the CIS.

Data for customs values have been drawn for various years from the "Customs Statistics on External Trade of the Russian Federation" and the Customs Committee of the Russian Federation. Nominal tariff rates were obtained from the "Customs Tariff of the Russian Federation", issued by the Customs Committee of the Russian Federation in 1998-2001. When tariffs were expressed in the combined form (the larger one of *ad valorem* then a specific rate is applied to import), the *ad valorem* equivalent of the specific rate was calculated first, and then the higher rate between *ad valorem* and specific ones was taken as nominal tariff rate. Unfortunately, it was impossible to estimate specific rates for all tariff lines, especially for clothes and automobiles, due to data unavailability. The introduction of seasonal tariffs, small changes in tariff rates (which occurred during each observed year) and the use of preferential tariffs towards imports from least-developed countries were also not taken into account.

The results of calculation are presented in the Table 1.

Table 1. Nominal Weighted Average Import Tariff Rates, in percentages

Industrial sector	Year	Industry as a whole	Finished products	Semi-finished products	Raw materials
All industries	1998	13.04			
	1999	11.69			
	2000	11.96			
	2001	11.63			
Electric power industry	1998	5.00	5.00		5.00
	1999	5.00	5.00		5.00
	2000	5.00	5.00		5.00
	2001	5.00	5.00		5.00
Oil and gas industry	1998	5.00	5.00		5.00
	1999	5.00	5.00		5.00
	2000	5.00	5.00		5.00
	2001	5.00	5.00		5.00
Coal industry	1998	5.00	5.00		5.00
	1999	5.00	5.00		5.00
	2000	5.00	5.00		5.00
	2001	5.00	5.00		5.00
Ferrous metallurgy	1998	12.37	13.34		5.00
	1999	12.98	13.73		5.00
	2000	12.36	13.69		5.00
	2001	10.45	11.36		5.00

Table 1. Continue

Industrial sector	Year	Industry as a whole	Finished products	Semi-finished products	Raw materials
Non-ferrous metallurgy	1998	10.16	12.70		6.92
	1999	9.76	12.98		6.07
	2000	10.22	14.94		6.00
	2001	13.10	16.48		7.57
Wood industry	1998	12.97	11.36	19.78	20.00
	1999	11.97	10.49	18.37	20.00
	2000	12.69	11.46	18.83	20.00
	2001	13.23	12.61	16.02	15.00
Chemical industry	1998	10.32	17.57	8.96	5.92
	1999	9.16	17.05	8.50	6.07
	2000	9.13	16.88	8.24	6.06
	2001	9.01	15.58	8.07	6.64
Building materials industry	1998	15.07	15.90		5.00
	1999	15.16	15.92		5.00
	2000	14.58	15.12		5.00
	2001	14.60	15.66		5.00
Light industry	1998	25.63	33.93	11.24	
	1999	22.47	35.27	11.63	
	2000	20.86	30.81	10.87	
	2001	18.63	21.34	9.74	
Food industry	1998	15.65	21.08	12.06	
	1999	13.90	18.91	12.26	
	2000	14.01	18.02	12.34	
	2001	14.93	16.98	14.22	
Other industries	1998	7.06			
	1999	8.81			
	2000	9.59			
	2001	8.19			
Agriculture	1998	10.44			
	1999	7.98			
	2000	8.48			
	2001	9.28			

Machine-building industry		Whole industry	Consumer goods	Semi-finished pro-ducts, parts	Instruments and equipment	Transport means
	1998	13.57	15.45	12.17	9.51	24.79
	1999	11.57	15.56	12.49	8.78	19.42
	2000	12.33	15.96	12.28	8.43	23.43
	2001	11.11	16.59	11.15	7.03	18.04

Note: Results of author's calculation.

As seen from the table above, nominal import tariff rates being applied in the Russian Federation are relatively low though close to those of such developed economies as Australia and New Zealand (see Table 2). In 2001 the nominal weighted average import tariff for all industrial commodities as a whole was only 11.12%, and it has been in a declining trend. In the same year, however, the Russian

Table 2. Bound Tariffs on Industrial Products, in percentages

Import Markets	Simple Average Bound Tariff
Canada	5.2
United States	3.9
Argentina	31.0
Brazil	30.0
Chile	25.0
Colombia	35.5
Mexico	34.8
Peru	30.0
Venezuela	33.9
European Union	4.1
Iceland	9.7
Norway	3.4
Switzerland	1.8
Turkey	42.6
Czech Republic	4.3
Hungary	9.7
Poland	3.4
Romania	1.8
Slovak Republic	42.6
Australia	14.2
Hong Kong, China	0.0
India	58.7
Indonesia	38.9
Japan	3.5
Korea, Republic of	11.7
Malaysia	17.2
New Zealand	12.7
Philippines	26.1
Singapore	4.6
Cameroon	17.6
Chad	17.8
Gabon	15.5
Senegal	13.8
South Africa	17.7

Source: World Trade Organization, Annual Report 2002, Table AIII.1, p. 42

government undertook an attempt at unification of the import tariff rates within commodity groups by lowering the maximum tariff rate from 30% to 20% and increasing some of the minimal rates from 0% to 5%, the revision has not caused significant change in the weighted average tariff rate.

It can be observed that the extracting industries (oil and gas industry, coal industry and electric power industry) are the least protected ones. All products in these industries are subject to a unified 5% rate, independently from the degree of processing. The low level of their protection is explained by the industries' relatively high competitiveness at the world and domestic markets and their high share in total industrial output and export (except for electric power industry).

The overall protection levels in other industries belonging to the group of industries with relatively high export potential is considerably higher, and it does not differ much from that of all industrial commodities as a whole. It has been found that weighted-average nominal tariff rates on finished products more than twice exceed those imposed on raw materials, with the exception of the wood industry. Ferrous metallurgy and non-ferrous metallurgy are characterized by a similar range of import tariffs, except for raw materials, with a slightly higher standard deviation of tariffs in the latter case (see Table 3). The chemical industry has relatively higher tariff peaks but lower dispersion of tariffs. In all cases, the standard deviation of the tariffs imposed on raw materials was considerably lower than that of finished and semi-finished products. Unlike all other industries, finished products in the wood industry are protected significantly weaker than that of raw materials and semi-finished products, moreover, rates for semi-finished products are lower than those on raw materials. This fact can possibly be explained by various factors; firstly, the low competitiveness of domestically-produced finished commodities in the industry at the domestic and world market; secondly, the desire of the government to stimulate development of production of semi-finished products; and thirdly, the desire to obtain higher revenues from the import of raw materials, with which Russia is extremely abundant. This industry is also characterized by the highest tariff peaks and a standard deviation of tariffs among all industries with relatively high export potential.

As for mainly import-competing industries, their production is subject to tariffs that are slightly higher than those in the processing industries of the group of industries with relatively high export potential, except for light industry and other industries. Import tariffs escalate depending on the degree of processing and importance of the commodity in the production process. The commodities that can be used in further production process are characterized by lower tariffs than the commodities used predominantly for consumer needs. The range of tariffs imposed on the products of most industries of this type is considerably wider than that in the case of industries with relatively high export potential. The highest tariff peaks and tariff dispersion are observed in food industry. Standard deviation of tariffs on finished products of this industry is almost three times higher than that on semi-finished products. In other industries of this kind, a standard deviation of tariffs does not vary much depending on the degree of processing and the extent of further participation in the production process, except for the building materials industry.

The light industry remains the most protected industry among all the industrial sectors of the economy, despite the fact that it does not have the comparative advantage in production. Light industries are characterized by extremely high production costs, low profitability, and considerably low competitiveness in the domestic and world markets. The weighted average tariff rate for the industry's finished products is equal to 21.34% (2001), and the rate for finished commodities is twice as higher than that on semi-finished products. However, it should be noted that the nominal level of protection in this industry has decreased after the 2001 customs tariff revision, especially for finished

Table 3. Dispersion of Tariffs in Different Industrial Sectors in 2001

Industrial sector	Indicator	Industry as a whole	Finished products	Semi-finished products	Raw materials
Electric power industry	Tariff range	5.00%	5.00%		5.00%
	Standard deviation	0.00	0.00		0.00
Oil and gas industry	Tariff range	5.00%	5.00%		5.00%
	Standard deviation	0.00	0.00		0.00
Coal industry	Tariff range	5.00%	5.00%		5.00%
	Standard deviation	0.00	0.00		0.00
Ferrous metallurgy	Tariff range	5.00% - 20.00%	5.00% - 20.00%		5.00%
	Standard deviation	4.52	4.98		0.00
Non-ferrous metallurgy	Tariff range	5.00% - 20.00%	5.00% - 20.00%		5.00% - 10.00%
	Standard deviation	4.73	5.94		3.79
Wood industry	Tariff range	5.00% - 42.53%	5.00% - 42.53%	5.00%-20.00%	15.00%
	Standard deviation	5.88	6.60	6.13	0.00
Chemical industry	Tariff range	5.00% ≷ 26.83%	10.00% - 26.83%	5.00% - 20.00%	5.00% - 10.00%
	Standard deviation	4.51	4.44	3.56	2.02
Building materials industry	Tariff range	5.00% - 20.00%	5.00% - 20.00%		5.00%
	Standard deviation	5.04	3.40		0.00
Light industry	Tariff range	5.00% - 64.80%	10.00% - 64.80%	5.00% - 20.00%	
	Standard deviation	7.03	6.02	6.23	
Food industry	Tariff range	5.00%- 100.00%	6.10% - 100.00%	5.00% - 32.79%	
	Standard deviation	11.54	16.95	5.55	
Other industries	Tariff range	6.63			
	Standard deviation	7.33			

		Whole industry	Consumer goods	Semi-finished products, parts	Instruments, and equipment	Transport means
Machine-building industry	Tariff range	5.00% - 30.00%	5.00% - 30.00%	5.00% - 20.00%	5.00% - 20.00%	5.00% - 21.00%
	Standard deviation	6.50	5.07	5.67	4.69	5.54

Note: Results of author's calculation.

products.

It can also be observed that despite the relatively low levels of protection in the machine-building industry as a whole, industrial sectors that manufacture consumer goods and means of transportation are protected considerably higher than the others.

The nominal rate of protection shows only the extent by which tariffs lead to an increase in the domestic price of commodities compared to the world price, but it can not show how such protection effects the industry's value-added, because it does not take into account the influence of nominal protection granted to industries supplying inputs used in the production process. This influence can be substantial if there is an escalation in nominal tariff rates depending on the degree of processing, as in the case of Russia. Therefore, the evaluation of effective protection is considered to be necessary to define the actual protection level in different industrial sectors in the Russian Federation. Such analysis is performed in the next section through the estimation of effective rates of protection.

2. Estimation of Effective Rates of Protection

The concept of an effective rate of protection (or ERP) was first suggested by Barber (1955) and later elaborated on by Bela Balassa (1965), Johnson (1965) and Corden (1966). Other authors who have addressed this issue include Basevi (1966), Either (1972), Bhagwati and Srinivasan (1973), Anderson (1988).

The effective rate of protection shows the extent to which the value-added of domestic industry is different from the value-added at world prices due to the existing protection structure. According to Corden: "It allows a single figure to sum up the net results of various trade and other taxes and subsidies affecting any particular activity".[16] The concept of ERP has several limitations: it assumes that all input-output coefficients are fixed; elasticities of demand are infinitive; all tradables remain traded after imposition of tariffs, other taxes and subsidies; and all tariffs, taxes, and subsidies are non-discriminatory between countries. However, despite these limitations an enormous amount of empirical studies have been carried out to calculate the effective rates of protection in order to analyze trade policies in different countries, because the analysis of ERPs helps to reveal the existing biases in trade policies and demonstrates the resource-allocation effects of existing protection structure.

There are four main methods of estimation of ERPs:

1. The Simple Balassa method, which treats non-traded inputs similarly to traded ones and incorporates them into calculations with zero tariffs.
2. The Complex Balassa method, which takes into account tariffs on tradable inputs contained in non-tradable inputs.
3. The Simple Corden method, which treats non-traded inputs as primary factors and lumps them with value-added.
4. The Complex Corden method, which aggregates the non-traded and primary-factor content of non-traded inputs with value-added, but groups the traded-input content of non-tradable inputs with traded inputs.

The method employed in this paper is the simple Corden method.

$$g_j = \frac{t_j - \sum_i a_{ij} t_i}{1 - \sum_i a_{ij}}$$,where

g_j = effective rate of protection of product j;

a_{ij} = share of product i in cost of the product j before tariff imposition;

t_j = nominal tariff rate on product j;

t_i = nominal tariff rate on inputted product i.

The ERPs in the Russian industrial sector have been calculated for the period from 1998 to 2001 to analyze the dynamics of change in the effective protection level. They have been estimated for all commodities as a whole to show the difference in protection levels of finished products (these are products, which are usually not used in the further production process of the studied industry), semi-finished products, and raw materials.

The existence of export tariffs on the limited number of primary commodities has been ignored, and weighted-average nominal import tariff rates estimated in the previous section have been used as nominal tariff rates. As for the tariff rates for production inputs, the following nominal weighted average tariff rates have been engaged:

1. For inputs from the electric power industry, oil and gas industry, coal industry, shale oil and peat industry, wood industry, light and food industries, other industries, and agriculture: the weighted average nominal tariff rates for all commodities as a whole of the corresponding industry.
2. For inputs from ferrous metallurgy, non-ferrous metallurgy, building materials industry, as well as light industry and food industry in estimation of the industries' own ERPs: the weighted average nominal tariff rates for semi-finished products.
3. For inputs from machine-building industry: the weighted average of weighted average nominal tariff rates for semi-finished products and parts, and instruments and equipment.
4. For inputs from chemical industry: weighted average of nominal weighted average tariff rates on semi-finished products and on raw materials.
5. For inputs from ferrous metallurgy, non-ferrous metallurgy, building materials industry, chemical industry, and wood industry in estimation of the industries' own ERPs: the weighted average nominal tariff rates for semi-finished products.

The input coefficients have been obtained from Russia's Input-Output Tables at Basic Prices included in Goscomstat's "System of Input-Output Tables for 1998 and 1999." Due to the unavailability of detailed data for 2000 and 2001, an estimation of effective rates of protection has been made from the data for 1999. The utilization of such estimative data is appropriate as the production technology does not change significantly during short periods of time.

Estimation Results

The results in the calculation of ERPs are presented in Table 4.

Table 4. Effective Rates of Protection in Different Industrial Sectors

Industrial sector	Year	Industry as a whole	Finished products	Semi-finished products	Raw materials
Electric power industry	1998	4.76			
	1999	4.70			
	2000	4.68			
	2001	4.71			
Oil and gas industry	1998	4.72			
	1999	4.82			
	2000	4.83			
	2001	4.86			
Coal industry	1998	3.79			
	1999	3.90			
	2000	3.93			
	2001	4.05			
Ferrous metallurgy	1998	18.74	20.65		4.20
	1999	18.79	20.32		3.92
	2000	17.59	20.13		3.79
	2001	13.93	15.64		3.71
Non-ferrous metallurgy	1998	12.73	17.30		6.89
	1999	13.01	19.23		5.86
	2000	13.96	23.09		5.79
	2001	18.45	24.99		7.74
Wood industry	1998	12.23	9.61	25.11	25.51
	1999	10.00	8.18	21.44	24.17
	2000	11.24	10.01	21.53	24.32
	2001	14.14	13.10	17.72	17.10
Chemical industry	1998	14.37	29.50	11.53	5.18
	1999	10.73	25.32	9.50	5.01
	2000	10.06	24.39	8.41	4.38
	2001	10.21	22.37	8.47	5.81
Building materials industry	1998	16.94	22.35		3.61
	1999	12.89	21.93		3.31
	2000	14.30	20.54		3.28
	2001	12.73	21.70		3.47
Light industry	1998	41.09	57.66	12.37	
	1999	37.80	50.54	13.13	
	2000	34.82	50.11	12.09	
	2001	30.74	36.93	10.54	
Food industry	1998	21.37	33.25	13.52	
	1999	19.82	32.31	15.55	
	2000	19.72	28.54	15.37	
	2001	20.09	25.43	18.24	
Other industries	1998	4.73			
	1999	6.39			
	2000	7.03			
	2001	3.06			

Table 4. Continue

Industrial sector	Year	Whole industry	Consumer goods	Semi-finished products, parts	Instruments, equipment	Transport means
Machine-building industry	1998	16.94	20.47	14.31	9.31	38.01
	1999	12.89	20.50	14.65	7.54	27.89
	2000	14.30	21.24	14.20	6.85	35.51
	2001	12.73	23.14	12.74	4.87	25.89

Note: Results of author's calculation.

As seen from the table above, the Russian system in protection of industrial sector has discriminated against the industries with relatively high export potential in favor of mainly import-competing industries. It can also be noted that in the case of former industries, the difference between overall effective and nominal protection is considerably smaller, except for non-ferrous metallurgy industries. However, in the case of ERPs on finished products not usually used further in the production process of the same industry, this difference is considerably higher but does not differ much from that of import-competing industries.

In most processing industries, ERPs on finished products significantly exceed those on products of industry as a whole, especially in the machine-building and chemical industries. ERPs on semi-finished products are considerably lower than that on finished products and only slightly exceed nominal rates. Raw materials as well as instruments and equipment are characterized by the lowest ERPs, which are lower than nominal rates in most cases. These rates are several times less than that of finished and semi-finished products, except for in the wood industry.

It was also discovered that during the observed period the value of ERPs has been declining in most processing industries in both groups. Substantial reduction of ERPs was recorded in the light industry, finished products of the food industry, the chemical industry, the ferrous metallurgy, semi-finished products and raw materials of wood industry, instruments and equipment, and means of transport. It is interesting to note that the revision of import tariffs in 2001 did not cause the reduction of overall level of effective protection, as would have been expected, but, on the contrary, resulted in its increase in most industrial sectors. This unexpected result can be explained by the relatively low share of consumer goods, rates on which have been reduced, in total Russian imports. Conversely, the influence of import tariff revision was noticeable when only ERPs of finished products were observed, especially in the case of light and machine-building industries. It was also substantial in the case of semi-finished products and raw materials in the wood industry.

It can be established that the extracting industries receive little protection for their products. ERPs on such industries are substantially low and their actual values are probably even smaller than the estimated ones, because the export tariffs imposed on several of their products are not included in the calculations. All these industries possess a revealed comparative advantage (RCA) in production;

their RCA indexes exceed unity and are substantially high, especially in the case of the oil and gas industry (see Table 5), therefore, they do not need any substantial protection.

Processing industries of the same group are characterized by considerably higher effective protection levels, but their ERPs are still much lower than those of import-competing industries. Similar to extracting industries, these industries have significantly high RCA indexes, except for the chemical industry and in the finished products of wood industry. Indexes for raw materials are notably higher than that of semi-finished and finished products.

The highest RCA was found in the production of wood industry's raw materials. However, despite the existence of substantial comparative advantage, raw materials as well as semi-finished commodities produced in this industry have considerably high ERPs. On the contrary, although the wood industry does not possess comparative advantage in the production of finished products, their ERP is significantly low, much less than that of both semi-finished products and raw materials. However, it should also be noted that as a result of the 2001 import tariff revision, ERPs for semi-finished products and raw materials considerably declined, while that of finished products increased. The ERP of raw materials actually became lower than the ERP of semi-finished products.

Among processing industries, included into the group of industries with relatively high export potential, the highest ERP was observed for finished products of chemical industry. Their ERP exceeded more than twice that of industry as a whole and of semi-finished products, and approximately five times that of raw materials. The chemical industry has a high RCA index for its main export commodities (fertilizers and organic chemicals), which contribute to more than 50% of industry's export;[17] however, RCA indexes calculated for the whole commodity groups were less than unified, thus showing the existence of revealed comparative disadvantage.

As expected, the highest ERPs were found in the light industry. This industry receives the strongest protection, despite the fact that it has the revealed comparative disadvantage in production. It is characterized by the lowest RCA indexes among all industrial sectors in the economy, which are substantially less than unified. This industry has the largest difference between nominal and effective protection for industry as a whole and for finished products. However, ERPs for semi-finished products are relatively low; they do not differ much from nominal rates and are more than three times lower than ERPs of finished products.

Among other mainly import-competing industries, the food industry as well as the transportation and machine-building industry remain considerably protected, and their ERPs significantly exceed the nominal rates. The lowest level of effective protection was found in the production of instruments and equipment. The ERP for such companies has a noticeably lower nominal rate with a declining trend. All import-competing industries have low RCA indexes, showing an absence of revealed comparative advantage in production; however, indexes for finished products of food industry and instruments and equipment show an increasing tendency.

Table 5. Indexes of Revealed Comparative Advantage

Industrial sector	Year	Industry as a whole	Finished products	Semi-finished products	Raw materials
Electric power industry	1998	3.49			
	1999	1.75			
	2000	0.86			
	2001	1.14			
Oil and gas industry	1998	9.43			
	1999	7.71			
	2000	5.83			
	2001	7.20			
Coal industry	1998	2.02			
	1999	2.02			
	2000	3.24			
	2001	3.02			
Ferrous metallurgy	1998	2.74	2.39		4.77
	1999	2.72	2.49		4.05
	2000	2.46	2.32		3.20
	2001	2.33	2.20		3.05
Non-ferrous metallurgy	1998	4.65	0.80		6.88
	1999	4.83	1.26		6.88
	2000	3.72	1.03		5.20
	2001	3.30	1.08		4.57
Wood industry	1998	0.93	0.38	1.24	8.11
	1999	1.05	0.39	1.31	10.14
	2000	0.97	0.38	1.27	8.55
	2001	1.00	0.38	1.34	9.97
Building materials industry	1998	0.27	0.20		0.73
	1999	0.31	0.26		0.64
	2000	0.30	0.26		0.56
	2001	0.29	0.23		0.63
Light industry	1998	0.13	0.10	0.24	
	1999	0.14	0.11	0.21	
	2000	0.10	0.06	0.22	
	2001	0.10	0.06	0.19	
Food industry	1998	0.20	0.10	0.29	
	1999	0.14	0.10	0.17	
	2000	0.19	0.13	0.25	
	2001	0.20	0.16	0.23	
Other industries	1998	1.13			
	1999	0.11			
	2000	0.09			
	2001	0.08			

Chemical industry		Main export commodities	Industry as a whole	Finished products	Semi-finished products	Raw materials
	1998	1.10	0.48	0.89	0.18	0.73
	1999	1.13	0.49	0.86	0.17	0.73
	2000	1.09	0.49	0.79	0.17	0.78
	2001	1.08	0.48	0.82	0.15	0.73

Table 5. Continue

Machine-building industry		**Whole industry**	**Consumer goods**	**Semi-finished products, parts**	**Instru ments and equipment**	**Transport means**
	1998	0.18	0.48	0.89	0.18	0.73
	1999	0.21	0.49	0.86	0.17	0.73
	2000	0.18	0.49	0.79	0.17	0.78
	2001	0.17	0.48	0.82	0.15	0.73

Notes: 1. RCA indexes were estimated by the author by using the following formula:

$$RCA = \frac{x_{ij}}{X_{it}} / \frac{X_{wj}}{X_{wt}}$$, where

x_{ij} = country i s export of product j; X_{it} = total export of country i; X_{wj} = world export of product j;

X_{wt} = total world export.

If the index takes a value greater than the unity (share of export of product j in country i s total export is larger than the corresponding world share), it means that country i has a revealed comparative advantage in product j, otherwise it has a revealed comparative disadvantage.

2. Export values were obtained from the United Nations, Department of Economic and Social Affairs, Comtrade Database, http://unstats.un.org/unsd/comtrade/default.aspx

3. Appropriateness of Implementation of Trade Liberalization in Different Industrial Sectors of the Russian Federation

There have been only a few works analyzing the possible effects of trade liberalization on the Russian industrial sector. Most scholars do not doubt the necessity of its implementation, yet many of their works lack discussions on its appropriate design. Although the effects of tariff reduction, discussed recently in the frameworks of Russia's accession to WTO, will most probably be modest, as demonstrated by National Investment Council (2002), there is a clear need to reconsider tariff policies in order to develop economically justifiable protection structure, which could effectively stimulate the development of the industrial sectors.

Tar (1998) suggested that Russia should abolish differentiated tariff protection and apply uniform tariff towards all its imports. However, such a policy can be extremely harmful for Russian industry, as has already been pointed out by Naray because; "this could inflict irreparable damage on some sectors and could lead to the waste of Russia's precious human resources".[18] Naray also noted that establishing tariff rates at very low levels would also be dangerous for the same reasons.

Afontsev (2002) noted that "the institutional system of tariff policy formation in Russia favors the protection of industries, whose low competitiveness in foreign trade is caused by the comparative advantage factors",[19] and this conclusion is confirmed by the estimations of ERPs made in the previous section. It can be concluded, therefore, that the predominantly established protection system in Russia took into account revenue arguments and lobbing interests but not economic efficiency.

The Russian government should first identify which industrial sectors really need protection

according to their potential to develop comparative advantage and then stop granting protection only because the industry produces non-raw materials commodities.

As has been mentioned earlier, light industry receives the largest protection among all industrial sectors, despite the fact that it lacks comparative advantage in production. Protection of this industry with high tariffs during the whole period after the Soviet Union's dissolution has not caused any productive growth and has not influenced import penetration much, except for the last 3 years. Moreover, as indicated by many researchers, this industrial growth has been achieved only due to the considerable ruble devaluation in 1998. From 2001, the growth of light industry has been slowing down, and imports of the industry's production grew significantly in that year. Thus it can be can concluded that there is no reasonable economic justification for providing high protection to light industries, and despite trade liberalization could adversely hit the industry's performance, it might provide substantial gains to consumers and lead to more effective allocation of the resources in the economy. The impact of trade liberalization on employment will not be significant because light industry accounts for only 6% of the labor force employed in industrial sector.

Reduction of tariffs in most sectors of the building materials industry can also be economically appropriate. Although this industry does not possess comparative advantages in external trade, it satisfies more than 85% of domestic demand. Russia is abundant with materials necessary for industrial production; therefore, trade liberalization of this sector will have little negative impact on the industry's performance yet will contribute to greater economic efficiency.

Tariff protection in the remaining import-competing industries might be allowed to remain at the existing level or even slightly increased. However, the government should clearly identify which of their sub-sectors really have the potential to become competitive (especially in the machine-building industry, which is considered by the government to be the key industry of the economy), and grant protection to them only, while other sub-sectors should be liberalized. In addition, this protection should be gradually reduced after expiration of a certain clearly defined period, regardless of whether the industry became competitive or not. Unfortunately, low data availability does not allow us to analyze industrial performance and effective protection at the more disaggregated level to define industrial potential and necessity of trade liberalization of the industries' sub-sectors. Overall trade liberalization of these industries can significantly impede their development and leave Russia highly dependent on production and export of primary commodities, which have low income elasticity of demand. Since the machine-building and food industry employ considerable part of Russia's labor force, their trade liberalization can have significant social consequences as well. Liberalization of machine-building industry can also negatively influence the performance of metallurgy industries because the machine-building industry accounts for approximately 36.5%[20] of domestically consumed production of these industries.

Substantial liberalization of the chemical industry can also significantly inhibit its further

development. Though this industry exports considerable part of its production, most of its export products are characterized by a low degree of processing, and products with higher degree of processing face high foreign competition. Since the chemical industry has a likely potential to become competitive, it can be concluded that preservation of the existing protection in import-competing sub-sectors with prospective comparative advantage is appropriate for some period. Trade liberalization of the export-oriented sub-sectors are justified, since it will not influence much the industrial performance.

Tariff reduction in the metallurgical industries and in most sub-sectors of the wood industry, with the exception of the furniture sector, is also desirable. These industries are relatively competitive, and their trade liberalization can help to reduce production costs in industries consuming their production and lead to more effective allocation of resources in the economy. As for the furniture industry, trade liberalization can severely impede its development since its domestic share is considerably small. Implementation of such a policy can lead to the disappearance of the furniture industry, despite the fact that it has perspective comparative advantage due to the abundance with cheap forest resources. Finally, there is not much need in tariff liberalization in the extracting industries as they are highly competitive; their protection is insignificant and serves only revenue purposes.

4. Conclusions

Designing appropriate tariff policies for Russia in accordance with the respective industrial sectors' possibilities to develop comparative advantage can provide considerable welfare gains to the economy. Lowering tariffs in stagnant industries will reduce the constraints on the effective allocation of resources and will help to establish a more efficient economic structure. Such policies also can provide substantial gains to consumers, and the gradual trade liberalization can contribute to productivity growth as well.

Limited investment capacity in most industrial sectors has constrained further industrial development. Therefore, even if an industrial sector has the potential to become competitive, and is receiving protection, it will never be able to exploit it unless the development of the appropriate tariff policy is closely coordinated with the development of carefully engineered industrial and investment policies.

Endnotes

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9. The data are calculated by the author on the base of data published in Goscomstat of the Russian Federation. 2002. Industry of Russia in 2001: Table 1.6.
10. Goscomstat of the Russian Federation. 2002. Industry of Russia in 2001: Table 1.16.
11. The data are calculated by the author on the basis of data included in Table 6.8 "Share of Imports in Total Domestic Demand at Purchaser Prices in 1998, in percentages" and Table 14.8 "Share of Imports in Total Domestic Demand at Purchaser Prices in 1999, in percentages", Goscomstat of the Russian Federation. 2002. System of Input-Output Tables for 1998 and 1999.
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13. Goscomstat of the Russian Federation. 2002. Industry of Russia in 2001: Table 9.4.
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Appendix 1. Conversion Table

Industry	Code in CIS's trade nomenclature			
	Whole industry	Only finished products	Semi-finished products	Raw materials
Electric power industry	2716			
Oil and gas industry	2709 - 2715			
Coal industry	2701, 2702, 2704 - 2708			
Other fuel industries	2703			
Ferrous metallurgy	2502, 2519, 2601, 2602, 2610, 2618, 261900100, 261900910, 2820, 2821, 72, 7301 - 7307, 7312 - 7314, 7317, 7318	7207 - 7229, 7301 - 7307, 7312 - 7314, 7317, 7318		2502, 2519, 2601, 2602, 2610, 2618, 261900100, 261900910, 2820, 2821, 7201 - 7206, 8111
Non-ferrous metallurgy	2510, 2527, 2529, 2603 - 2609, 2611 - 2617, 2620, 2621, 2805, 2816 – 2819, 2822 - 2825, 2843, 2846, 7401 - 7416, 7501 - 7507, 7601 - 7609, 7614, 7801 - 7805, 7901 - 7906, 8001 - 8006, 81, 8305, 8311, 8545	7407 - 7416, 7505 - 7507, 7604 - 7609, 7614, 7803 - 7805, 7904 - 7906, 8003 - 8006, 8113, 8545		2510, 2527, 2529, 2603 - 2609, 2611 - 2617, 261900930, 261900950, 261900990, 2620, 2805, 2816 - 2819, 2822 - 2825, 2843, 2846, 7401 - 7406, 7501 - 7504, 7601 - 7603, 7801, 7802, 7901 - 7903, 8001, 8002, 8101 - 8112
Chemical industry	2503, 2511, 2512, 2528, 2801 - 2804, 2806 - 2815, 2826 - 2842, 2844, 2845, 2847 - 2851, 2901 - 2935, 2938 - 2940, 31, 3203 - 3213, 3215, 33, 3401 - 3406, 3502, 3506, 3507, 3601 - 3604, 37, 3801 - 3803, 3805 - 3815, 3817 - 3824, 39, 40, 54, 55, 5902, 5903, 5906, 630533, 8523, 8524, 940370, 9616	31, 3303 - 3307, 3401, 3402, 3405, 3406, 3602 - 3603, 37, 3922, 3924, 3926, 4012 - 4016, 8523, 8524, 940370, 9616	3203 - 3213, 3215, 3301, 3302, 3403, 3404, 3502, 3506, 3507, 3801 - 3803, 3805 - 3815, 3817 - 3824, 3916 - 3921, 3923, 3925, 4003 - 4011, 4017, 54, 55, 5902, 5903, 5906, 630533	2503, 2511, 2512, 2528, 2801 - 2804, 2806 - 2815, 2826 - 2842, 2844, 2845, 2847 - 2851, 2901 - 2935, 2938, 2939, 3901 - 3915, 4001, 4002
Wood industry	3605, 3804, 44, 45, 46, 47, 48, 9401, 940330, 940340, 940350, 940360, 940380, 940390300, 9404	3605, 4414, 4419, 4420, 46, 48, 9401, 940330, 940340, 940350, 940360, 940380, 940390300, 9404	3804, 4406 - 4413, 4415 - 4418, 4421, 4502 - 4504, 47	4401 - 4405, 4501

Appendix 1. Continue

Industry	Code in CIS's trade nomenclature			
	Whole industry	Only finished products	Semi-finished products	Raw materials
Building materials industry	2504 - 2509, 2513 - 2518, 2520 - 2526, 2530, 3214, 3816, 5904, 5905, 68, 69, 70	2522, 3214, 3816, 5904, 5905, 68, 69, 70		2504, 2505 - 2509, 2513 - 2518, 2520, 2521, 2523 - 2526, 2530, 2715
Light industry	3201, 3202, 4104 – 4111, 42, 43, 5004 - 5007, 5104 - 5113, 5204 - 5212, 5306 - 5311, 56, 57, 58, 5901, 5907 - 5911, 60, 61, 62, 6301 – 6304, 6305 excluding 630533, 6306 - 6310, 64, 65, 66, 67, 9601 – 9612, 9614, 9615, 9617	42, 4303, 4304, 57, 61, 62, 63 excluding 6310, 6401 - 6405, 65, 66, 67, 9601 - 9605, 9608 – 9612, 9614, 9615, 9617	3201, 3202, 4104 – 4111, 4301, 4302, 5004 - 5007, 5104 - 5113, 5204 - 5212, 5306 - 5311, 56, 58, 5901, 5907 - 5911, 60, 6310, 6406, 9606, 9607	
Food industry	02, 03, 0402 - 0406, 0408, 0410, 0504, 0710 - 0714, 080620, 0811 - 0814, 09, 11, 1208, 13, 15, 16, 17, 1803 - 1806, 19, 20, 21, 22, 23, 24, 2501, 3501 - 3505	0305, 0403, 0406, 0408, 0410, 0901-0903, 16, 1704, 1806, 19, 20, 2101, 2105, 2106, 22, 2309, 2402, 2403	02, 0301 - 0304, 0306, 0307, 0402, 0404, 0405, 0504, 0710 - 0713, 080620, 0811 - 0814, 0904 - 0910, 11, 1208, 13, 15, 1701 - 1703, 1803 – 1805, 2102 - 2104, 2301 - 2308, 2401, 2501, 3501 - 3505	
Other industries	2936, 2937, 2941, 30, 3407, 49, 71, 9018 - 9022, 92, 9402, 9501 - 9505, 9618			
Agriculture	01, 0401, 0407, 0409, 0511, 06, 0701 - 0709, 0714, 0801 - 0805, 080610, 0807 - 0810, 10, 1201 - 1207, 1209 - 1214, 14, 1801, 1802, 4101 - 4103, 5001 - 5003, 5101 – 5103, 5201 – 5203, 5301 - 5305			

Appendix 1. Continue

Machine-building industry	Whole industry	Consumer goods	Semi-finished products, parts	Instrument, equipment	Transport means
	7308 - 7311, 7315, 7316, 7319 - 7326, 7417 - 7419, 7508, 7610 - 7616, 7806, 7907, 8007, 82, 8301 - 8304, 8306 - 8310, 84, 85 excluding 8523, 8524 and 8545, 86, 87, 88, 89, 9001 - 9017, 9023 - 9033, 91, 93, 940310, 940320, 940390100, 940390900, 9405, 9406, 9506 - 9508, 9604, 9608, 9613	7321, 7323, 7417, 7418, 7615, 8212, 8215, 8303, 8304, 8306, 841510, 841810, 841821, 841829, 841830, 841840, 841891, 8450, 8452, 8469 - 8472, 8476, 8510, 8513, 851631, 851632, 851633, 851640, 851650, 851660, 851671, 851672, 851679, 851711, 851719, 851721, 851722, 851780, 8518 - 8521, 8527, 8528, 8713, 8715, 8716, 9003 - 9008, 91, 940310, 940320, 9507, 9508, 9613	7308 - 7311, 7315, 7316, 7319, 7320, 7322, 7324 - 7326, 7418, 7419, 7610 - 7613, 7616, 7806, 7907, 8007, 8301, 8302, 8305, 8307, 8309, 8310, 8407 - 8409, 8411, 8412, 841520, 841590, 8431, 8448, 845530, 8455900000, 8466, 846890, 8473, 8482 - 8485, 8501, 8503 - 8507, 851680, 8516900000, 8522, 8529, 8532 - 8534, 8538 - 8542, 8544, 8546 - 8548, 8607, 8609, 8706 - 8708, 8714, 8803, 8804, 8805, 8908, 9001, 9002, 9033, 940390100, 940390900, 9406	8201 - 8211, 8213, 8214, 8401 - 8406, 8410, 8413, 8414, 841581, 841582, 841583, 8416, 8417, 841850, 841861, 841869, 841899, 8419 - 8430, 8432 - 8449, 8451, 8453, 8454, 845510, 845521, 845522, 8456 - 8465, 8467, 846810, 846820, 846880, 8474, 8475, 8477 - 8481, 8502, 8508, 8509, 8511, 8512, 8514, 8515, 851610, 851621, 851629, 8517300000, 851750, 8525 - 8526, 8530, 8531, 8535 - 8537, 8543, 8608, 870130, 870190, 9009 - 9017, 9023 - 9032, 9405	8601, 8602, 8603, 8604, 8605, 8606, 870120, 8702, 8703, 8704, 8705, 8709, 8710, 8711, 8712, 8716, 8801, 8802, 8901, 8902, 8903, 8904, 8905, 8906, 8907

Note: Table is constructed by the author.