Import Dependence and Import Substitution in Russian Manufacturing: A Business Viewpoint

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Abstract

The aim of this study is to evaluate the import dependence of Russian industrial firms as well as analyze the 'switch' to using Russian products and technologies in the context of their availability and firms' interest in them. The main information source for the study was a survey of company executives conducted in September-October 2015. The obtained results suggest that in quantitative terms the import consumption levels for the manufacturing industries in Russia are relatively small, especially compared with the corresponding levels of Western Europe countries. At the same time, about two thirds of the surveyed companies are significantly dependent on imports, primarily imports of machinery and equipment. The main reason for the use of imports is the absence of Russian analogues. If they are present, there are problems with the low quality of those Russian analogues and the fact that they are not in line with the client's technological requirements. In general a higher level of import dependence is typical for high-tech and successful companies, which means that these companies are the most vulnerable to any import restrictions.

Current import dependency level does not satisfy many companies which forces them to try to reduce this dependency: mostly it takes the form of switching to national suppliers, slightly less often – import diversification. The Russian import substitution policy is associated with an attempt revive, modernize or create the missing production elements in the national economy, i.e. it is essentially vertical. However, without a combination with the horizontal measures, such as the development of certain critical technologies, the formation of new areas of knowledge and filling previously missing science competences, such a policy is characterized by a 'limited shelf life', constant lag, with a focus primarily on the price competitiveness. All this generates an expansion of an economy that is highly sensitive to currency fluctuations. A proactive import substitution policy linked to new emerging markets is needed.

Keywords: import of products, technologies, and services; import dependence; import substitution; Russian industry; technological level of production; firms' behavior.

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The focus of the import substitution strategy currently being implemented in Russia is the manufacturing sector. There are two main reasons for prioritizing these government policy objectives: the deteriorating international situation and the related risks (some of which have already materialised) of discontinued imports of products, technologies, and services Russian companies need, combined with the officially recognised high import dependence of a whole range of Russian industries [Ministry of Industry and Trade, 2015].

Theoretical approaches to import substitution evolved in the scope of the structuralist and neo-Keynesian schools of thought[1]. The structuralist approach is based on a division of the global economy into a centre and periphery. The import substitution policies of "peripheral" countries were seen as a means of overcoming their lagging behind, and reducing their economic dependence on the industrially developed "centre" [*Prebisch*, 1950; *Cristobal*, 1990; *Franko*, 2007]. Meanwhile neo-Keynesians consider substituting imported manufactured products with locally produced ones the key driver of economic growth [*Chenery, Syrquin*, 1975]. Criticism of import substitution policies in most cases is aimed at their structuralist versions – when trying to overcome dependence on industrially developed countries, governments of "peripheral" ones fell into the extreme of autarkic industrial development, and in their desire to make the economy self-sufficient, they ignored the advantages offered by international division of labour [*Baer*, 1972; *Bruton*, 1998].

A rich practical experience of implementing import substitution policies has been accumulated by now, not just in developing, but also in industrially developed, countries as well. For the former, such policies commonly serve "catch-up" industrial development purposes, striving to reduce the economic and technological dependence on the leading nations of the world – which brings them into the domain of structuralist approaches. Some of the developed countries pursuing import substitution policies are trying to step up socio-economic development on the regional and local levels; one of the best examples is the US (see, e.g., [*Kwon*, 2010; *Kurre*, 2011]). The re-industrialisation initiated by the US and the EU is directly related with this issue; the so-called *reshoring* became its major component after the 2008–2009 recession – i.e. bringing major corporations' production facilities back in their home countries. This trend became the strongest in the US, where it was actively supported by the government, which believes it contributes to job creation and gives an extra impulse to economic growth [*Irisova*, 2013; *Panicz*, 2015; *Pobyvaev, Tolkachev*, 2015]. On the whole, industrial nations' approach to import substitution is leaning towards the neo-Keynesian theory.

The implementation of large-scale import substitution policies in Latin American countries is commonly seen as a classic example of the (initially) predominantly structuralist approach[2]. Argentina was the pioneer here, having started to pursue relevant policies in the mid-1940s, followed by several other countries in the region. Initially import substitution was mainly promoted in consumer industries which did not require major investments or advanced (in global terms) competencies, such as textile, light manufacturing, and food industries. Subsequently import substitution support was extended to more capital- and knowledge-intensive industries and sectors too. In addition to implementing various preferential and protectionist measures, governments of certain countries, in particular Brazil, made a lot of effort to bring in foreign investments. Major international companies and transnational corporations were actively drawn into large-scale long-term investment projects which implied the localisation of production and technology transfer [*Baer*, 1972; *Debowicz, Segal*, 2014; *Kravchenko*, 2015; *Vatolkina, Gorbunova*, 2015; *Kozyreva, Novikova*, 2015].

Though certain measures had a negative impact on industries and sectors not considered high priority, the results of the first stage of import substitution policy implementation in Latin American countries were favourable. The previous signs of stagnation were replaced by a noticeable growth; the share of manufacturing industries in these nations' economies increased; and the quality of life improved. The success of Latin American countries prompted China, India, and certain Sub-Saharan African countries to adopt similar policies in the 1960s [*Bruton*, 1998; *Kwon*, 2010; *Vatolkina, Gorbunova*, 2015; *Kozyreva, Novikova*, 2015].

However, by the mid-1970s the positive results of import substitution policies, largely accomplished by saturating the domestic market and attracting foreign investments, were beginning to be increasingly eclipsed by negative effects later collectively referred to as the "import substitution syndrome" [*Bruton*, 1998]. Excessive selective protectionism, and the irrational selection of sectors and industries to receive priority support, frequently without considering their comparative advantages, resulted in "greenhouse" conditions created for certain industries (and especially for specific companies), which turned into barriers hindering the flow of capital from inefficient production firms to efficient ones. Combined with an excessively strong focus on domestic demand, this resulted in locally made products' loosing global competitiveness. Also, due to import substitution policies' priorities skewed in favour of capital-intensive sectors, demand for financial resources significantly increased. Such resources primarily came

[1] Certain authors, though, derive import substitution theory from early mercantilism [*Animitsa et al.,* 2015], with its insistence on limiting product imports.

[2] Note that one of the founders of the structuralist school, Raúl Prebisch, played a major role in shaping and implementing this policy as head of the UN Economic Commission for Latin America in the 1950s and early 1960s [*Franko,* 2007].

from revenues generated by traditional sectors of the economy, in particular agriculture (mainly by exporting their products), and from foreign investments and loans. However, the regular expropriation of the traditional sectors' revenues, without paying due attention to their development, resulted in their gradual weakening, while the recession in developed countries had a negative impact on the availability of financial resources for developing countries [*Bruton*, 1998; *Rodrigues*, 2005; *Kwon*, 2010; *Zilberman, Strovskiy*, 2009; *Bodrunov, Rogova*, 2014; *Vatolkina, Gorbunova*, 2015; *Kravchenko*, 2015].

In the 1980s the "import substitution syndrome" in various Latin American, Sub-Saharan African, and Asian countries (in particular India) became a major factor in the deterioration of the economic situation, a large-scale production slump, hyper-inflation, debt crisis, and social tension. All this prompted national governments to abandon 'heavy' import substitution policies and adopt a new, revised development model which provided for liberalisation of foreign trade, promoting exports and direct foreign investments, and reducing the role of the state in the economy (including reduced direct public support and large-scale privatisation) [*Bruton*, 1998; *Narula*, 2002].

Many see the experience of a number of East Asian countries, first of all the so-called Asian Tigers (Taiwan, South Korea, Singapore, and Hong Kong), where import substitution in effect was only an element of comprehensive government policies to encourage and promote exports, as an alternative to the Latin American countries' import substitution policies (especially their second 'heavy' stage). The aforementioned Asian countries' governments concentrated on promoting high-tech industries, creating a favourable business environment, and investing in industrial infrastructure and education. It can be argued that at the core of this development model was the focus on external markets, and using national competitive advantages to the greatest extent possible. At the same time, various countries' specific policies were quite different. For example, South Korea and Taiwan have significantly limited foreigners' opportunities to invest in priority sectors of their economies, and actively implemented protectionist policies. In Singapore and Hong Kong, on the contrary, there were practically no limitations on direct foreign investments, while these countries' governments concentrated on developing infrastructure. The steps they took helped to increase the competitiveness of the nations' industries on the global economy, significantly diversify the national economies, increase exports, and ultimately achieve sustainable economic growth [*Bruton*, 1998; *Narula*, 2002; *Amsden*, 2004; *Zhu*, 2006; *Ogujiuba et al.*, 2011; *Kondratiev*, 2014; *Demidenko*, 2015].

On the whole, government promotion of import substitution in Latin American countries provides an example of a vertical industrial policy, while relevant national strategies implemented by the Asian Tigers can be seen as a horizontal industrial policies[3].

Approximately a year and a half after the relevant policy was announced in Russia, the authorities' declarations gradually became more clear and practically oriented. The most noticeable step along this way was the Russian Ministry of Industry and Trade's approval of import substitution action plans for 20 industries, mostly in the mechanical engineering sector (19 of them are civilian,[4] and the conventional weapons industry is an extra[5]). Contrary to the title, the bulk of the plans' content is not a description of specific actions but lists of, in total, about two thousand products and technologies which are supposed to be substituted with Russian analogues. Industry-specific plans are currently being reconsidered, i.e. a small range of top-priority projects is being identified to provide massive public support to, mostly using existing mechanisms and tools. However, there are examples of new support mechanisms being developed, oriented (exclusively or mostly) towards import substitution, or of existing government policy tools being adapted to better suit relevant objectives. Such new mechanisms include[6] special investment contracts between the state and investors, aimed at setting up, upgrading, or launching production of manufacturing products, in particular those currently unavailable in Russia[7]. Government funding is provided to cover the costs of participants in industrial clusters set up to implement joint import substitution projects[8]. An example of existing tools' adaptation is the restructuring of the Russian Foundation for Technological Development: import substitution in effect became the priority objective of the new Industrial Development Fund created on its basis. Note also a tendency to support import substitution-related projects which became apparent in activities of certain other development institutes such as the Foundation for Assistance to Small Innovative Enterprises and Vnesheconombank — which is at least reflected in their published reports.

The current attempt to implement an import substitution policy in Russia is far from the first. In particular, since the late 1990s the government was trying to attract leading international companies into the Russian automobile industry, with a view toward gradually stepping up their localized production.

[3] For more on industrial policy types see, e.g., [*Kuznetsov, Simachev,* 2014; *Simachev et al.,* 2014b].

[4] Russian Ministry of Industry and Trade orders of 31 March 2015 №№ 645, 647-663, of 20 January 2016 № 197.

[5]. Russian Ministry of Industry and Trade order № 762 of 2 April 2015. However, unlike the plans for civilian industries (typically grand and lengthy), this document only mentions two product types: sporting rifles and ammunition for them.

[6] See, e.g., regulation of the Council of Federation of the RF Federal Assembly № 512-SF of 9 December 2015.

[7] RF Government regulation № 708 of 16 July 2015 "On special investment contracts in specific industries".

[8] RF Government regulation № 41 of 28 January 2016 "On approval of Rules for Allocation of Federal Budget Subsidies to Participants of Industrial Clusters to Cover Part of the Costs of Joint Projects to Make Industrial Products for Import Substitution Purposes".

However, in terms of reducing the share of imported cars the results of these efforts were rather modest (see, e.g., [*Dranev et al.*, 2014]. On the other hand, the scale of measures currently being implemented or planned is unprecedented in recent Russian history, at least in terms of the number of industries covered by such initiatives.

It would be premature trying to assess the results of import substitution promotion, though one important aspect which can potentially undermine this policy is already apparent: its pronounced political undertones. Politics are pushing into the background the issue of how relevant the steps being taken or planned (and the import substitution strategy as such) are to the actual needs and interests of Russian companies – consumers of the imported products and technologies. Meanwhile this issue is critically important for the policy being implemented to achieve a positive impact, and not just for individual companies and industries but for the whole Russian economy.

Study goal, objectives, and data

The goal of the study is to empirically analyse Russian manufacturing companies' import dependence, and their potential (and willingness) to switch to Russian products and technologies. The main objectives of the study include the following:

- Assess the current level of Russian companies' dependence on imported products, technologies, and services used in their production processes;
- Analyse the reasons of Russian companies' choosing imported products, technologies, and services, and their potential to switch to Russian analogues;
- Analyse companies' efforts and plans to reduce their import dependence.

The data for the study is based on was collected in the course of a survey of Russian manufacturing companies' managers conducted in September-October, 2015. The objective of the survey (commissioned by the Interdepartmental Analytical Center and implemented by the Information and Publishing Centre "Statistics of Russia") was to identify and measure the scale, trends, and sources of product, technology, and service imports by Russian manufacturers; assess the current level of their import dependence; their import substitution needs; and the steps they were taking and planning in this field. The survey's sample was designed taking into account companies' size and industries they belong to, with priority attention given to the industries for which the Russian Ministry of Industry and Trade approved import substitution promotion plans.

658 companies were included in the final sample (Table 1), about half of which belong to the engineering sector, and more than a quarter — to high-technology sectors. This structure was due to the aforementioned intention to primarily examine high-priority industries, in import substitution terms. Private companies prevail in the sample (as they do in the Russian manufacturing sector generally), though companies with public participation also have a sizeable representation. There are grounds to believe that the latter serve as conduits of government plans and ideas more frequently than others, including in the import substitution area.

An important feature of the sample is the approximately equal shares of small firms and relatively large companies. A sampling bias in relation to the entire population of industrial companies where small businesses dominate was provided during its initial design, since large companies are more frequently regulated by the state (and receive support from it) [*Fier, Heneric,* 2005; *Aschhoff,* 2010; *Simachev et al.,* 2014b], including probably in the scope of import substitution policy. Financial circumstances of most of the surveyed companies were relatively favourable, but the sample also includes a significant proportion of companies facing financial problems. A noticeable share of companies experience a powerful pressure by the competition, primarily from foreign producers – which is important in terms of analysing the potential and conditions for import substitution. The sample includes a large representation of companies exporting their products in the former USSR republics and other countries – which, together with companies' financial situation and technological level, can be seen as a characteristic of their "quality".

Empirical analysis

Consumption of imports, and companies' dependence on them

A predominant proportion of the sample (about 85% of the companies) apply imported products, technologies, and services in their production. At the same time the share of imports in their production costs is usually not very high: for almost two thirds of the surveyed companies it does not exceed 20% (Figure 1). Industry-wise, the highest shares of imported products, technologies, and services in production costs were held by light and textile industry companies, car manufacturers, makers of pharmaceutical products, producers of electronic, radio, and computer equipment. The lowest shares were noted for companies producing railway rolling stock, shipbuilding and ship repair firms, producers of metallurgical and metal products, machinery and equipment manufacturers (except machine tools), and aircraft construction companies.

Data collected during the survey allows to calculate "top" and "bottom" averages for import shares, for the whole sample and specific industries (Table 2). Despite their notional nature, comparing these figures

Table 1. **Structure of the sample**

Sample design criteria		Company type	Share in the sample, %
Industry		Textiles, clothes, and footwear production	7.5
		Wood processing, production of timber, cellulose, paper and carton products	5.3
		Chemical production (except pharmaceuticals)	6.2
		Pharmaceutical production	4.7
		Metallurgy, production of metal products	9.7
		Production of machinery and equipment (except machine tools)	18.8
		Production of machine tools	4.0
		Production of electrical machinery and equipment	8.4
		Production of computers, data processing, radio, TV, and communication equipment	9.4
		Production of medical equipment	4.9
		Production of instruments	3.7
		Automobile industry	4.6
		Shipbuilding	4.1
		Rolling stock manufacturing	4.9
		Aircraft construction	4.0
Industry's technological level[I]		Low	22.5
		Medium	50.9
		High	26.6
Duration of operations		Less than 5 years	8.8
		5 - 10 years	16.3
		10 - 20 years	26.9
		More than 20 years	48.0
Number of employees		Less than 100	24.8
		101–200	23.0
		201–500	24.3
		More than 500	28.0
Public participation (including state corporations) in ownership			15.0
Member of an integrated business structure			29.2
Company's technological level[II]		Backward[III]	49.1
		Advanced[IV]	19.9
Financial situation		Poor	17.9
		Satisfactory	69.9
		Good	12.2
Key customers		Businesses*	84.2
		Population*	23.0
		State*	26.3
Competition on the domestic market	From Russian companies	None	8.2
		Moderate	55.9
		Strong	35.9
	From foreign companies	None	24.0
		Moderate	38.8
		Strong	37.2
Export	To the former USSR	None	45.3
		Up to 10% of output	46.1
		More than 10% of output	8.7
	To other countries	None	69.0
		Up to 10% of output	23.4
		More than 10% of output	7.6

[I] Here and below, high-technology industries include production of pharmaceuticals, computers, data processing, radio, TV, and communication equipment, medical equipment, instruments, and aircraft; medium-technology industries include chemical production (except pharmaceuticals), production of machinery and equipment, production of electrical machinery and equipment, automobiles, ships, and rolling stock; low-technology industries include production of textile, clothes, and footwear, wood processing, production of timber, cellulose, paper and carton products, metallurgy, and production of metal products (in accordance with the Federal State Statistics Service order No. 21 of 14.01.2014).

[II] Unlike industry's technological level, this indicator measures the level of specific companies compared with other Russian and international companies with an identical or similar profile.

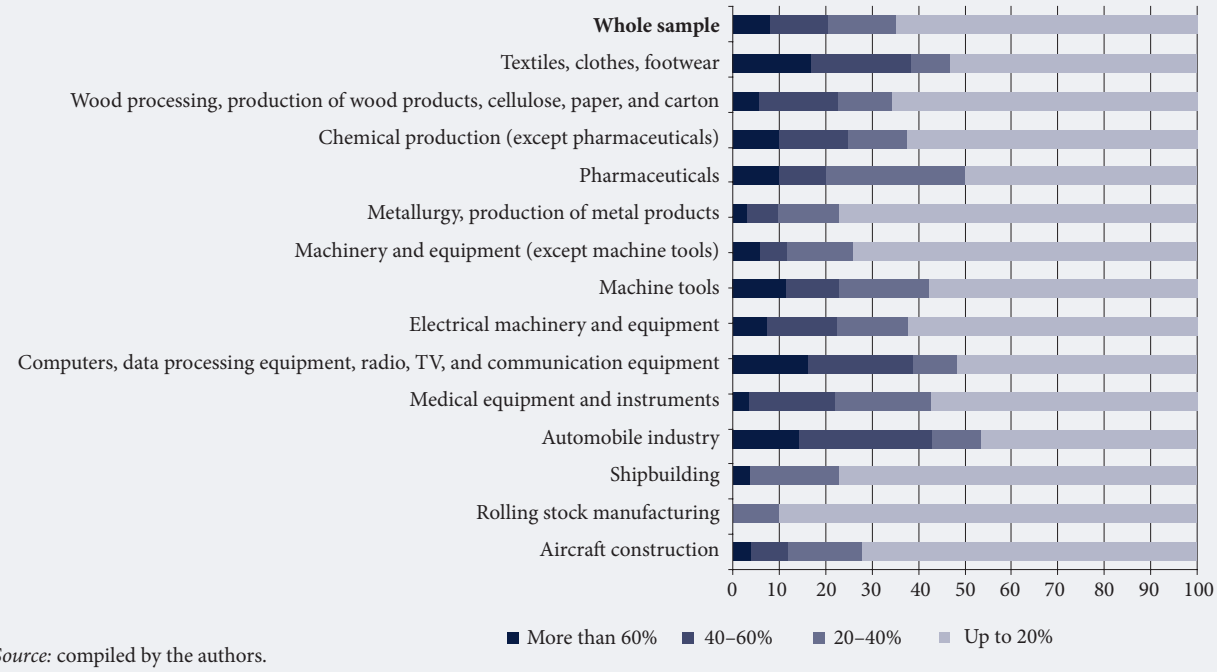
[III] Companies whose technological level is lower than that of international producers', and not higher than Russian ones'.

[IV] Companies whose technological level is higher than that of Russian producers', and not lower than international ones'.

* Not mutually exclusive groups.

Source: composed by the authors.

Figure 1. **Share of imports in production costs, by industry** (%)



Source: compiled by the authors.

with relevant indicators for certain Western European countries reveals that Russian companies' import consumption is certainly not higher than theirs.

An obvious advantage of the "share of imports in production costs" indicator is that it provides a very clear idea of the extent of companies' use of foreign products, technologies, and services – which explains the indicator's active application in present-day economic analysis practices (see, e.g., [*Berezinskaya, Vedev*, 2015; *Faltsman*, 2015]). At the same time it would be wrong to argue that this indicator is a completely accurate measure of businesses' actual overall import dependence. Even when consumption is insignificant, import dependence can be very strong indeed – e.g. if there are no real alternatives to the foreign products, technologies, and services. The picture of import dependence and its level would not be complete without qualitative assessments obtained through surveys.

Three quarters of the companies in the sample were import-dependent, to a certain degree; for more than a third of them dependence was high or critical (Figure 2). Interestingly, in about a half of the cases high import dependence was combined with a small share of imports in production costs.

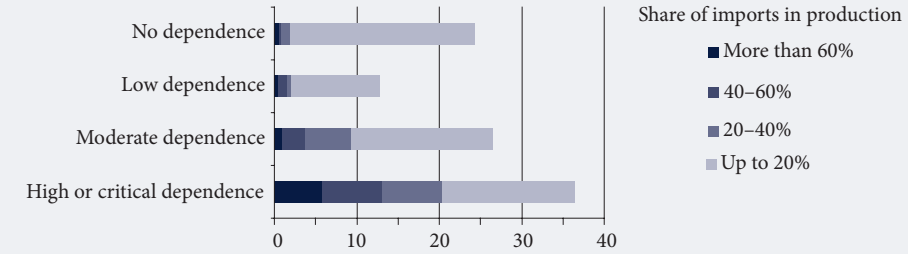
Despite the differences in the scale of companies' use of imports, and in the degree of their actual import dependence, the results of quantitative (Figure 1) and qualitative (Figure 3) assessment for specific industries are rather close to each other. In both cases the highest level of import dependence was noted

Table 2. **Shares of imports in manufacturing industries: international comparison** (%)

	Russia*	Germany**	France**	Spain**	Italy***
All manufacturing	13–31	34	34	43	32
Textile industry	15–34	39	43	46	31
Wood processing, wood products	4–24	36	34	39	27
Pulp and paper industry	21–40	34	37	45	28
Chemical industry	16–35	34	29	55	47
Metallurgical industry	6–22	28	28	39	43
Machinery and equipment production	10–28	25	21	27	27
Production of electronic and optical equipment	19–37	45	24	49	34
Automobile industry	22–41	38	44	63	37
Production of other vehicles and transport equipment	6–21	26	35	48	35

* Average share of imports in production costs in 2015 (survey data).
** Share of imports in output in 2007
*** Share of imports in output in 2005
Sources: the authors' calculations, [*Bravo, Alvarez,* 2012].

Figure 2. **Degree of companies' import dependence, and share of imports in production costs** (%)



Source: compiled by the authors.

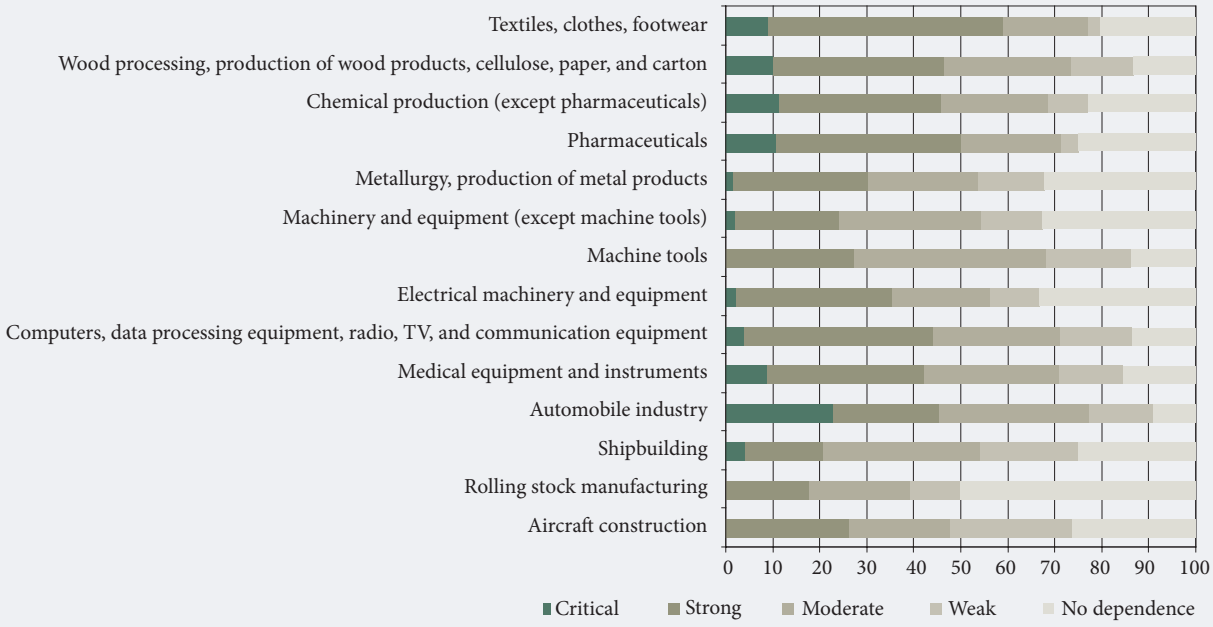
in light and textile industries, pharmaceuticals, automobile and electronic industries. Manufacturers of rolling stock, metallurgical and metal products, machinery and equipment (except machine tools), shipbuilders and aircraft makers are the least import-dependent.

To identify factors affecting companies' import dependence, the parameters of an ordered logistic regression model were estimated, with quantitative (share of imports in production costs) and qualitative assessments of the dependence serving as explanatory variables (i.e. all aforementioned characteristics of the companies included in the sample). Companies' properties measured by these independent variables can be divided into three groups:

- Basic characteristics such as industry (specification 1), or the industry's technological level (specification 2), duration of operations, number of employees, public participation in ownership, membership in an integrated business structure;
- Current state (the company's technological level compared with similar Russian and international firms, and financial state);
- Market position (key customers, competition from Russian and foreign companies, exports into neighbouring and other countries).

The regression analysis revealed (Table 3) that higher levels of import consumption and import dependence alike were typical of three groups of companies: the high-technology sector ones, technological leaders, and companies facing a strong competition from foreign producers. Companies with public participation use imports to a lesser extent, and are less dependent on them.

Figure 3. **Companies' import dependence by industry** (%)



Source: compiled by the authors.

Table 3. **Share of imports in production costs, and companies' import dependence: estimated ordered logistic regression model parameters** (%)

Independent (dummy) variables			Dependent (order)variable			
			Share of imports in production costs		Import dependence	
			Specification			
			1	2	1	2
Industry		Textile, clothes, and footwear production		excl.		excl.
		Wood processing, production of timber, cellulose, paper and carton products		excl.		excl.
		Chemical production (except pharmaceuticals)		excl.		excl.
		Pharmaceutical production		excl.		excl.
		Metallurgy, production of metal products	– **	excl.	– ***	excl.
		Production of machinery and equipment (except machine tools)	– **	excl.	– ***	excl.
		Production of machine tools		excl.		excl.
		Production of electrical machinery and equipment		excl.	– **	excl.
		Production of computers, data processing, radio, TV, and communication equipment		excl.		excl.
		Production of medical equipment and instruments	control	excl.	control	excl.
		Automobile industry		excl.		excl.
		Shipbuilding	– *	excl.	– *	excl.
		Rolling stock manufacturing	– **	excl.	– ***	excl.
		Aircraft construction		excl.	– **	excl.
Industry's technological level		Low	excl.		excl.	
		Medium	excl.	control	excl.	control
		High	excl.	+ ***	excl.	+ ***
Company age		Less than 5 years				
		5 - 10 years			+ *	
		10 - 20 years	control			
		More than 20 years	– ***	– ***		
Number of employees		Up to 100				
		101–200				
		201–500	control			
		More than 500			+ **	+ **
Public participation in ownership			– *	– **	– **	– **
Member of an integrated business structure					+ ***	+ ***
Company's technological level		Backward				
		Advanced	+ **	+ **	+ **	+ ***
Financial situation		Poor				
		Satisfactory	control			
		Good				
Key customers		Businesses			– *	– **
		Population				
		State			– *	– *
Competition on the domestic market	From Russian companies	None				
		Moderate	control			
		Strong				
	From foreign companies	None				– *
		Moderate	control			
		Strong	+ ***	+ ***	+ ***	+ ***
Export	To the former USSR	None			– ***	– ***
		Up to 10% of output	control			
		More than 10% of output			– **	– *
	To other countries	None				
		Up to 10% of output	control			
		More than 10% of output		– *		
Chi-square			113.94***	87.98***	177.49***	144.58***
Maximum variance inflation factor (VIF) value			2.90	1.86	3.05	1.87
N			636		564	

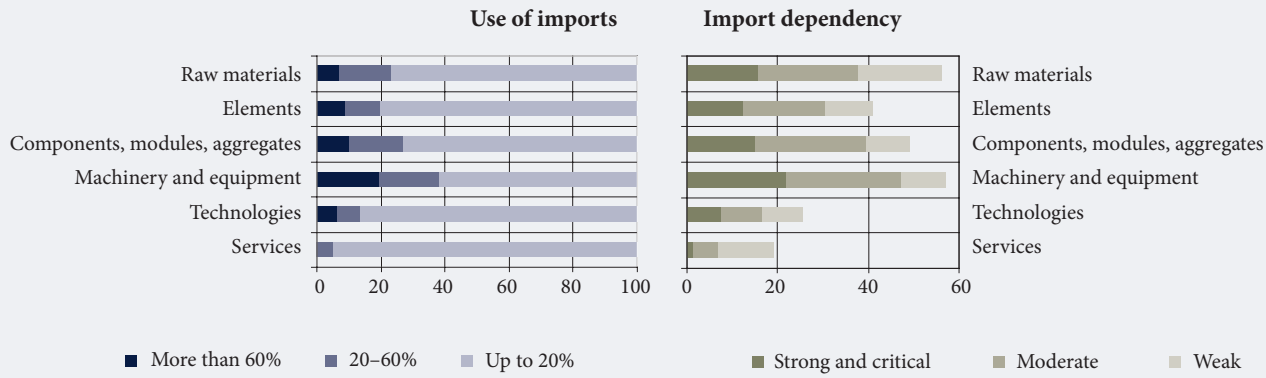
Note: here and below the following significance coefficients were used:

* = 10% significance; ** = 5% significance; *** = 1% significance.

Excl. = variable not included in the specification.

Source: composed by the authors.

Figure 4. **Share of imported products, technologies, and services companies use, and the latter's dependence on these product groups** (%)



Source: compiled by the authors.

In many respects the quantitative and qualitative assessments of import dependence coincide, but there are also important differences between them. For example, companies which have been on the market for more than 20 years tend to have a lower share of imports in their production costs. Large companies and members of integrated business structures show a relatively higher import dependence.

Companies' dependence on main components of imports

In addition to companies' overall import dependence, it would be also interesting to analyse its distribution by main consumption areas such as materials, components, modules and aggregates, machinery and equipment, technologies, and services. Imports play the most important role, both in terms of their share in relevant consumption categories and the degree of companies' import dependence in machinery and equipment, and the least important — in intangible technologies, and especially services (Figure 4).

It should be stressed that the large-scale use of imported machinery and equipment was noted in all industries without exception (Figure 5), but companies' import dependency in different industries significantly varies. For example, light industry, textile, and pharmaceutical companies also significantly depend on imported raw materials; the producers of automobiles, machinery, and equipment depend on imported modules and aggregates (note that in the machine tools industry this group of imported products is even more important than finished machinery and equipment). For the chemical and forest industries, wood processing, pulp and paper, shipbuilding and aircraft construction companies, the import of raw materials is quite important, together with foreign-made aggregates and modules. Manufacturers of medical equipment, instruments, electronics, and communication gear significantly depend on the supply of imported elements. Finally, imports of intangible technologies are particularly important for the automobile, chemical, forestry, wood processing, and pulp and paper industry companies.

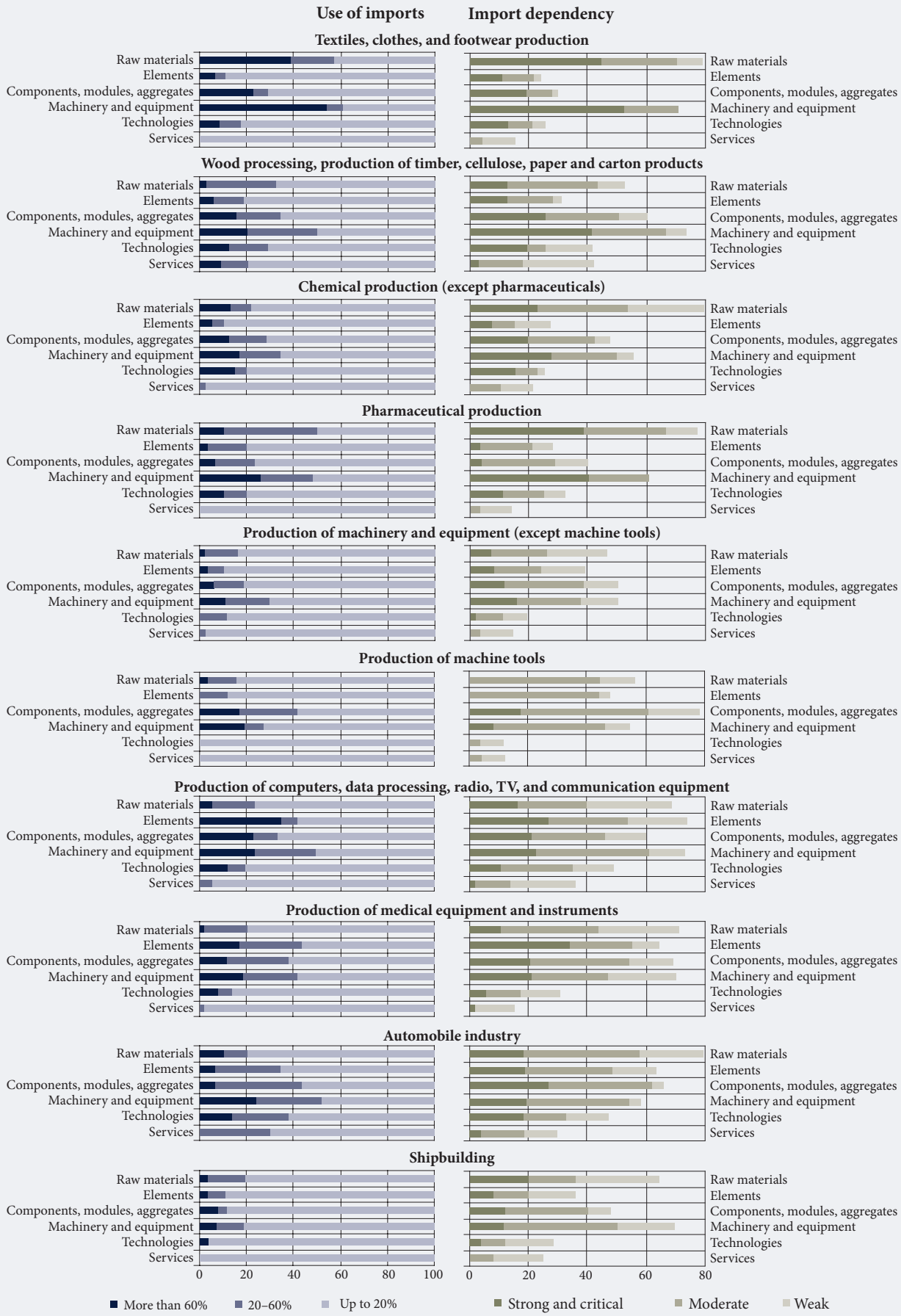
The estimated parameters of the ordered logistic regression models for a quantitative and qualitative assessment of companies' import dependence on each product group (Table 4) allows for making the following conclusions:

- High-technology companies are more dependent on all types of imports under consideration. Low-technology companies also significantly rely on imported machinery, equipment, and services;
- Companies which have been operating for more than 20 years are less dependent on imported technologies and services than others;
- Companies in a healthy financial situation more frequently import intangible technologies;
- Companies' focus on consumer demand is positively linked with their use of imported raw materials;
- Stiff competition from imports forces companies to more actively use imported products and technologies in their production;
- Companies who do not export their products (first of all to the former USSR) are less import-dependent.

Reasons why companies use imports

To successfully implement import substitution plans, it is critically important not only to measure the current level of import dependence (using both quantitative and qualitative assessments), but also to understand the reasons why Russian companies opt for foreign products, technologies, and services. This

Figure 5. **Share of imported products, technologies, and services companies use, and the latter's dependence on these product groups, by industry** (%)



Source: compiled by the authors.

:Table 4. Share of imported products, technologies, and services companies use, and the latter's dependence on these product groups estimated parameters of ordered logistic regression models

Independent (dummy) variables			Dependent (order)variable											
			Share of imports used(consumed)						Dependence on imports					
			Raw materials	Elements	Components, modules, aggregates	Machinery and equipment	Technologies	Services	Raw materials	Elements	Components, modules, aggregates	Machinery and equipment	Technologies	Services
Industry's technological level		Low	+ ***			+ ***		+ **				+ ***	+ **	+ **
		Medium	Control						Control					
		High	+ **	+ ***	+ **	+*	+ *		+ **	+ ***		+ *	+ ***	+ ***
Duration of operations		Less than 5 years										– **		
		5 - 10 years	Control											
		10 - 20 years							Control					
		More than 20 years	– **		– *		– ***	– ***					– ***	– ***
Public participation in ownership														– *
Number of employees		Up to 100										– **		
		101–200		+ **				– ***						
		201–500	Control						Control					
		More than 500												
Membership in an integrated structure				+ ***	+ ***	+ **	+ **			+ **	+ ***	+ ***	+ **	+ **
Company's technological level		Backward												
		Advanced	+ *	+ **				+ **			+ *			
Financial situation		Poor		– ***		– ***	– *					– ***		– *
		Satisfactory	Control						Control					
		Good					+ **						+ **	+ **
Key customers		Businesses			– ***	– **		+ *			– **	– *	– **	
		Population	+ **	– ***				+ ***	+ ***	– ***	– *			
		State				– **		+ **	– *			– *		
Competition on the domestic market	From Russian companies	None	+ *											
		Moderate	Control						Control					
		Strong		+ ***	+ *	+ **								+ **
	From foreign companies	None	– **		– **	– **								
		Moderate	control						Control					
		Strong		+ ***	+ **		+ ***		+ ***	+ **	+ **	+ ***	+ ***	
Export	To the former USSR	None			– **	– **	– **		– **	– **	– **	– ***	– ***	– *
		Up to 10% of output	control						Control					
		More than 10% of output					– **					– ***		
	To other countries	None							– *					– **
		Up to 10% of output	control						Control					
		More than 10% of output	– *				+ ***		– ***	– *				
Chi-square			77.02***	126.19***	82.51***	117.88***	82.512***	62.40***	91.93***	81.08***	65.58***	141.17***	91.14***	84.53***
Maximum variance inflation factor (VIF) value			2.52	2.42	2.46	2.46	2.43	2.41	1.86	1.85	1.84	1.86	1.84	1.86
N			627	623	624	631	626	636	633	640	634	621	641	637

* = 10% significance; ** = 5% significance; *** = 1% significance

Source: compiled by the authors.

would allow one to identify major "bottlenecks" in Russian supply, which should be turned into priority objectives of the national import substitution policy.

The most common reason companies opt for imported products, technologies, and services is the total absence of Russian alternatives — at least in the respondents' opinion. Russian analogues frequently have inferior quality or do not meet the consumer companies' technological requirements. Much less frequently Russian products, technologies, or services cannot compete price-wise, or in terms of delivery and payment. The least important reason according to the respondents was Russian producers' violating intellectual property rights.

An analysis of the reasons why Russian producers opt for imported products, services, and technologies in specific industries (Table 5) reveals that the lack of Russian alternatives is particularly acute in the high-technology sector, namely in pharmaceuticals, computers and electronics, medical equipment and instrument. This issue is least important for the producers of rolling stock.

The insufficient quality of Russian products, technologies, and services compared with foreign alternatives and their inability to comply with customers' technological requirements act as powerful incentives to opt for imports for manufacturers of computer equipment and electronics. Also, the low quality of Russian analogues is very important for automotive companies, and inability to meet technological requirements is important for machine tools makers. In addition, the risk of Russian suppliers' violating intellectual property rights is also comparatively important to the computer producers, while insufficient level of maintenance and technical support services offered by Russian suppliers of products and technologies

Table 5. **Main reasons of opting for imported products, by industry** (%)

Industries \ Answer options	No Russian alternatives available	Russian alternatives are more expensive	Russian suppliers offer less convenient delivery and payment terms	Higher risk of Russian suppliers' breaching contract terms and conditions	Lower quality of Russian analogues	Russian analogues do not fully meet the company's technological requirements	Russian suppliers do not offer adequate maintenance, support services	Russian suppliers may violate intellectual property rights
Whole sample	60.9	23.9	12.0	8.5	41.6	35.0	9.3	3.5
Textiles, clothes, footwear	71.4	20.4	4.1*	2.0*	20.4***	28.6	6.1	2.0
Wood processing, production of wood products, cellulose, paper, and carton	62.9	20.0	11.4	22.9***	51.4	31.4	14.3	5.7
Chemical production (except pharmaceuticals)	70.7	36.6**	7.3	7.3	36.6	43.9	7.3	4.9
Pharmaceuticals	77.4*	25.8	11.8	0.0*	38.7	38.7	12.9	0.0
Metallurgy, production of metal products	53.1	17.2	9.4	10.9	46.9	39.1	7.8	1.6
Machinery and equipment (except machine tools)	55.6	25.8	8.1	4.8	37.1	25.8**	8.1	1.6
Machine tools	34.6***	38.5*	23.1*	11.5	38.5	57.7**	19.2*	0.0
Electrical machinery and equipment	61.8	16.4	12.7	9.1	34.5	23.6*	5.5	1.8
Computers, data processing equipment, radio, TV, and communication equipment	71.0*	32.3	17.7	14.5*	51.6*	51.6**	4.8	4.8
Medical equipment and instruments	82.1***	16.1	8.9	14.3	51.8	44.6	14.3	7.1
Automobile industry	66.7	33.3	20.0	6.7	56.7*	40.0	13.3	13.3***
Shipbuilding	48.1	25.9	18.5	11.1	40.7	18.5*	7.4	3.7
Rolling stock manufacturing	28.1***	15.6	25.0**	3.1	46.9	18.8**	9.4	3.1
Aircraft construction	50.0	15.4	3.8	0.0	38.5	38.5	11.5	3.8

Note: variance significance (chi-square):* = 10%; ** = 5%; *** = 1%.

Source: compiled by the authors.

affects machine tools producers. Chemical and machine tool companies more often than others opt for imports because of the high prices of Russian products, technologies, and services. For the latter group, and for rolling stock manufacturers, delivery and payment terms offered by Russian suppliers play a significant role in their choosing imported alternatives. The risk of Russian partners' breaching contractual obligations is particularly relevant for the forest industry, wood processing, and pulp and paper companies.

Regression analysis results (Table 6) show that for high-technology companies, the low quality of Russian supply and its inability to meet the technological requirements are also quite important, in addition to lack of Russian alternatives to imported products, technologies, and services. Companies with long market experience frequently experience a lack of Russian analogues, which appears somewhat counterintuitive — one would expect them to have well-established contacts with a steady circle of regular Russian suppliers, as a part of their system of cooperation frequently going back to the Soviet period. At the same time such companies have problems with Russian products', technologies', and services' quality, and their inability to match technological requirements less often than other groups do. The described problems, together with insufficient level of maintenance and support services offered by Russian suppliers, and risks of their violating contractual obligations are more important to large businesses.

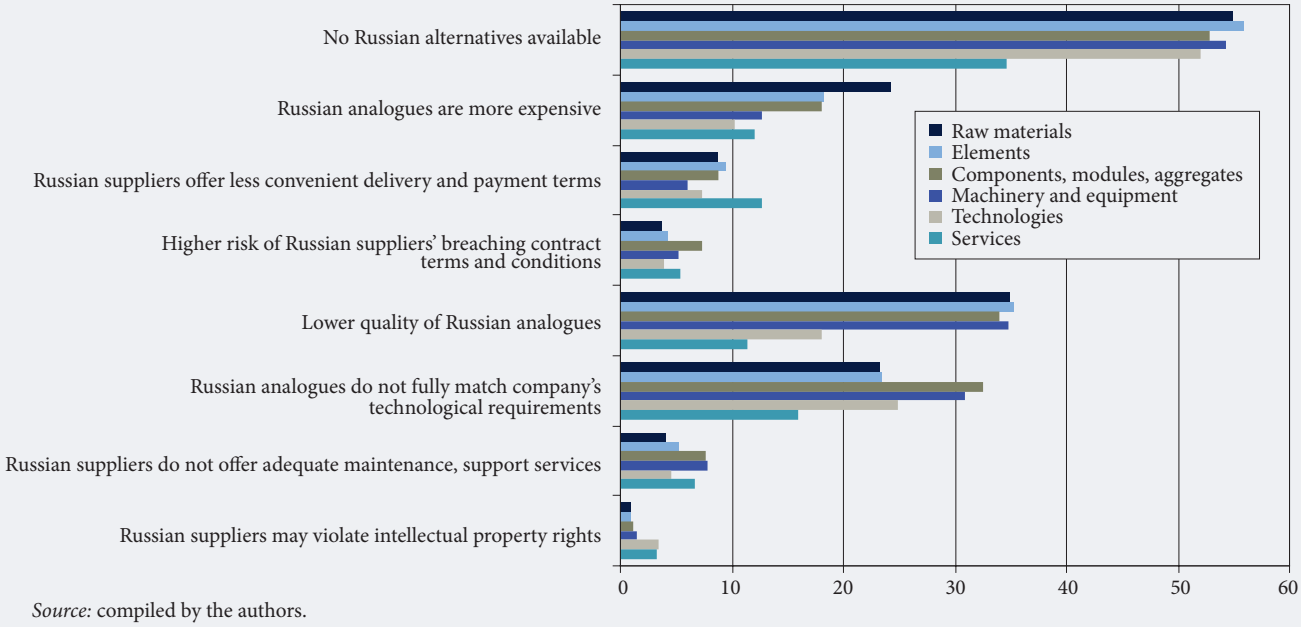
For the members of integrated business structures, the main reason to opt for imports (apart from lack of competitive alternatives) is the less attractive delivery and payment terms offered by Russian suppliers, and the problems with the latter meeting technological requirements (which are quite strict, due to tight technological integration of vertical production chains).

The already noted high import dependence of companies – technological leaders is due to several factors such as the higher prices of Russian alternatives, risks of Russian suppliers' not carrying out their contractual obligations, low quality of the supply and its inability to meet technological requirements, and inadequate support and maintenance infrastructure for Russian products, technologies, and services.

Companies exporting their products to the former USSR and those facing strong competition from imports, frequently encounter a total lack of alternatives to imported products, technologies, and services. And if Russian analogues do exist, they are offered at too high a price (the main barrier for companies trying to compete with imports), or do not provide sufficiently high quality (the primary reason exporter companies do not opt for them).

Companies' motivation to use imports is not closely linked with the type of imported products (Figure 6). We can only note that the high prices issue is more frequently mentioned regarding Russian raw materials, and the inability to meet technological requirements – regarding aggregates, modules, machinery, and equipment. Unlike products, Russian technologies and especially services are much less often criticised for their low quality and inability to meet companies' technological requirements. The lack of Russian analogues on the market was least often noted for services, though their potential consumers frequently complained about insufficiently flexible payment terms.

Figure 6. **Main reasons for opting for imported products, technologies, and services** (%)



Source: compiled by the authors.

Table 6. **Main reasons of opting for imported products: estimated parameters of binomial logistic regression models**

Independent (dummy) variables			Dependent (dummy) variable							
			Lack of Russian alternatives	Russian analogues are more expensive	Russian suppliers offer less suitable delivery and payment terms	Higher risk of Russian suppliers' breaching contractual obligations and delivery terms	Lower quality of Russian analogues	Russian analogues do not exactly meet company's technological requirements	Russian suppliers offer insufficient maintenance, technical support services	Russian suppliers may illegally use other people's intellectual property
Industry's technological level		Low		– *						
		Medium	control							
		High	+ ***				+ *	+ ***		
Duration of operations		Less than 5 years		– **				– **		
		5 - 10 years								
		10 - 20 years	control							
		More than 20 years	+ *				– **	–- *		
Public participation in ownership								–- **		
Number of employees		Up to 100						–- **		
		101–200				+ *				
		201–500	control							
		More than 500				+ *	+ *	+ ***	+ *	
Membership in an integrated structure			+ ***		+ *			+ *		
Company's technological level		Outsider	– **							
		Leader		+ *		+ ***	+ ***	+ **	+ **	
Financial situation		Poor								
		Satisfactory	control							
		Good								
Key customers		Businesses	– **	+ **			+ **			
		Population		+ *						+ *
		State				+ **			+ *	
Competition on the domestic market	From Russian companies	None	– *							
		Moderate	control							
		Strong					+ **	– *		
	From foreign companies	None								– *
		Moderate	control							
		Strong	+ ***	+ **				+ *		
Export	To the former USSR	None	– **				– ***	– **		
		Up to 10% of output	control							
		More than 10% of output			+ *					+ *
	To other countries	None								
		Up to 10% of output	control							
		More than 10% of output			– *				– *	
Chi-square			110.64***	44.82***	42.20**	35.60*	70.46***	112.43***	34.,52*	25.30
Maximum variance inflation factor (VIF) value			1.85							
N			658							

Note: variance significance (chi-square). * = 10%; ** = 5%; *** = 1%.

Source: composed by the authors.

Figure 7. **Actions companies take to reduce their import dependence (reference rate by managers of companies using imported products, technologies, and services, %)**

Source: compiled by the authors.

Companies' actions to reduce import dependence

The unfavourable international political and economic situation, combined with risks of it deteriorating even further and amid the government's import substitution initiatives, could prompt Russian companies to take steps to reduce their import dependence. About two thirds of companies included in the sample who use imports have already taken such steps by the time of the survey, and 14% more were planning to do so in the near future. The most common such measure was stepping up procurement from Russian suppliers (Figure 7); about two times less frequently, but still relatively often, companies took steps to diversify their imports by going to alternative international suppliers. Much less common were attempts to reduce import dependence by setting up new production – which is quite understandable due to associated problems and high costs it involves. Less obvious was the fact that import substitution production was most commonly launched by Russian companies on their own, as opposed to jointly with international partners.

An industry-specific analysis of actions taken by companies (Table 7) shows that procurement of Russian products, technologies, and services is most frequently stepped up by metallurgic companies, manufacturers of metal products, and rolling stock. The latter, together with car makers and producers of computer equipment, more often set up new production facilities together with foreign partners. Launching new production on their own is more typical of manufacturers of medical equipment, instruments, and aircraft construction companies. The aircraft manufacturers, as well as metallurgical companies, metal products and rolling stock manufacturers, also more actively encourage Russian suppliers to substitute imports.

To identify factors which determine companies' choice of import substitution strategies, the parameters of binomial logistic regression models were estimated, with the standard set of regressors supplemented by order variables reflecting the degree of companies' dependence on various import components (Table 8).

Large companies, firms competing with other Russian producers, and companies exporting their products at least to the former USSR more often than others take actions to reduce their import dependence. Companies exporting to countries beyond the former Soviet Union are more likely to make efforts to diversify their imports, while firms supplying products to former Soviet republics, on the contrary, take such steps very rarely.

High-technology companies tend to set up their own import substitution production, independently or jointly with foreign firms, and to encourage Russian suppliers to substitute their own imports. At the same time, such companies rarely increased their procurement from Russian producers, at least by the time of the survey. Stepping up procurement in Russia is more typical of companies with public participation, and (somewhat more unexpectedly) of integrated business structures' members. Companies focused on public procurement relatively often diversify their imports, encourage import substitution by Russian producers, and set up their own production, jointly with foreign partners and on their own. However, that also holds true for companies who mostly sell their products to the population.

Main results of the study

1. Quantitatively, Russian manufacturing companies' consumption of imports is relatively low; it does not exceed Western European figures and frequently remains below them. At the same time a predominant share of Russian manufacturing companies are import-dependent, to a greater or lesser extent.

Table 7. **Actions companies take to reduce their import dependence, by industry (reference rate by managers of companies using imported products, technologies, and services,** *%*)

Industries \ Answers	No actions taken	Increased procurement from Russian suppliers	Diversification of imports, reducing dependence on specific suppliers/ countries of origin	Setting joint production with foreign companies in Russia	Setting up own production	Encouraging Russian suppliers to substitute imports
Textiles, clothes, and footwear production	25.6	46.5	27.9	0.0	9.3	7.0
Wood processing, production of timber, cellulose, paper and carton products	29.4	41.2	14.7	0.0	11.8	5.9
Chemical production (except pharmaceuticals)	32.4	29.7*	21.6	0.0	16.2	8.1
Pharmaceutical production	33.3	40.7	25.9	0.0	7.4	0.0
Metallurgy, production of metal products	36.7	57.1**	18.4	2.0	6.1	14.3*
Production of machinery and equipment (except machine tools)	36.4	46.5	16.2	4.0	5.1**	2.0**
Production of machine tools	25.0	37.5	12.5	4.2	0.0*	8.3
Production of electrical machinery and equipment	26.1	43.5	23.9	6.5	17.4	8.7
Production of computers, data processing, radio, TV, and communication equipment	26.3	29.8**	24.6	8.8**	8.8	12.3
Production of medical equipment and instruments	30.2	41.5	18.9	3.8	22.6***	9.4
Automobile industry	28.6	53.6	21.4	10.7*	3.6	0.0
Shipbuilding	40.9	50.0	13.6	4.5	4.5	9.1
Rolling stock manufacturing	21.1	63.2*	15.8	10.5	15.8	15.8
Aircraft construction	26.1	39.1	21.7	0.0	26.1**	17.4*

Note: variance significance (chi-square). * = 10%; ** = 5%; *** = 1%.

Source: composed by the authors.

2. The main reason companies opt for imported products, technologies, and services is the lack of Russian alternatives on the market. When this is not the case, the insufficient quality of Russian supply, and its inability to meet companies' technological requirements move to the foreground. Issues related with prices, delivery and payment terms, level of maintenance and support services offered typically play a less important role in Russian companies' choosing imports over domestic analogues.

3. The current import dependence degree is a point of concern for most of the companies who consume foreign products, technologies, and services, and prompts them to take actions to reduce it. The most common strategy is changing the procurement structure — most frequently in favour of Russian suppliers, and less often to diversify the imports.

4. On the whole, Russian companies most actively acquire (and therefore most strongly depend on) imported machinery and equipment. This is due, on the one hand, to many companies' highly obsolete, in physical and moral terms, capital assets, and on the other, to frequently encountered lack of Russian analogues on the market, their low quality, or inability to fully meet present-day technological requirements, combined with a certain degree of inertia in system integrators' preferences (who are used to working with imported equipment) [*Mekhanik*, 2013; *Kvashnina et al.*, 2013; *Tsukhlo*, 2015]. Note that in manufacturing, as in the Russian economy generally, the procurement of tangible technologies (i.e. machinery and equipment) traditionally accounts for the biggest share of companies' expenditures on technological innovation [*Gorodnikova et al.*, 2016].

5. A high demand for foreign-made machinery and equipment is common to all manufacturing industries, but specific industries' import dependence profiles are quite different from each other. For example, raw materials' imports are crucial for the light and textile industries, chemical and pharmaceutical companies, and shipbuilding. Manufacturers of medical, computer, and communication equipment display a higher demand for elements; imported components, modules, aggregates, and technologies are very much important to car producers. A relatively low level of import dependence was noted for rolling stock manufacturers: they see the lack of Russian analogues for products, technologies, and services they need as less of a problem than others do.

6. High-technology companies are very much import-dependent, in all product groups; they encounter an insufficient supply of Russian alternatives, or the latter's inability to comply with technological requirements more frequently than others. This explains the fact that this sector's companies substitute imports with ready-made Russian solutions less often than firms specialising in other industries do, and more frequently launch own production or encourage their Russian suppliers to do so.

Table 8. **Actions companies take to reduce their import dependence: estimated parameters of binomial logistic regression models**

Independent variables			Dependent (dummy) variable					
			No actions taken	Increased procurement from Russian suppliers	Diversification of imports, reducing dependence on specific suppliers/countries of origin	Setting joint production with foreign companies in Russia	Setting up own production	Encouraging Russian suppliers to substitute imports
Import dependence degree		Raw materials (order)						
		Elements (order)	– **			+ **		
		Components, modules, aggregates (order)					+ ***	
		Machinery and equipment (order)						
		Technologies (order)						
		Services (order)						– ***
Industry's technological level		Low (dummy)				– *		
		Medium (dummy)	control					
		High (dummy)		– ***			+ *	+ *
Duration of operations		Less than 5 years (dummy)						
		5 - 10 years (dummy)			– *			
		10 - 20 years (dummy)	control					
		More than 20 years (dummy)			– *			
Number of employees		Up to 100 (dummy)	+ *					
		101–200 (dummy)						
		201–500 (dummy)	control					
		More than 500 (dummy)	– *		+ *			
Public participation in ownership (dummy)				+ *				
Member of an integrated business structure (dummy)				+ **				
Company's technological level		Backward (dummy)						
		Advanced (dummy)						– **
Financial situation		Poor (dummy)			– *			
		Satisfactory (dummy)	control					
		Good (dummy)			+ **		+ *	
Key customers		Businesses (dummy)						
		Population (dummy)					+ *	
		State (dummy)			+ **	+ ***	+ *	+ **
Competition on the domestic market	From Russian companies	None (dummy)	+*					+ **
		Moderate (dummy)	control					
		Strong (dummy)						
	From foreign companies	None (dummy)						
		Moderate (dummy)	control					
		Strong (dummy)						
Export	To the former USSR	None (dummy)	+ **		– **			
		Up to 10% of output (dummy)	control					
		More than 10% of output (dummy)	+ *					
	To other countries	None (dummy)			+ **	+ **		
		Up to 10% of output (dummy)	control					
		More than 10% of output (dummy)						
Chi-square			62.20***	44.67*	65.73***	41.14	48.05**	55.88***
Maximum variance inflation factor (VIF) value			1.79					
N			561					

* = 10% significance; ** = 5% significance; *** = 1% significance

Source: composed by the authors.

7. A high degree of import dependence was discovered for members of integrated business structures, which may be due to several factors. Firstly, switching to alternative suppliers at will may be simply impossible due to the "links" of vertically integrated production chains, since it could lead to technological mismatches with related productions. Probably that explains why members of such structures named Russian analogues' inability to match technological requirements as a key reason they use imports in the first place. Secondly, quite a few Russian companies are members of transnational corporations – which, as active players in the global market, widely apply international division of labour, with transboundary operations being an integral part of their business. Thirdly, integrated business structures, especially large and very large ones, tend to display a certain degree of inertia in their choice of products, technologies, and services, and suppliers thereof [*Neprintseva*, 2006; *Kaushan, Bogushevskiy*, 2009]. However, in the current economic situation it is the members of integrated business structures who display a tendency towards stepping up procurement from Russian suppliers.

8. Companies with a long history of operations depend on imported technologies and services to a lesser extent than others, due to their established links with Russian R&D organisations, which frequently go back all the way to the Soviet period [see, e.g.: *Simachev et al.*, 2014b].

9. A relatively low, against the general background, consumption of imports and degree of import dependence is displayed by companies with public participation. They are stepping up procurement of Russian products, technologies, and services, probably not least because of the relevant "incentives" they receive from the state, via its representatives in these companies' management.

10. Companies who primarily sell their products to individual consumers more actively use imports, first of all imported raw materials. This is important because consumer demand acts as the main driver of new and improved products' supply by Russian companies [*Ivanov et al.*, 2012], which in turn probably affects the latter's demand for imports. A significant incentive for consumer products' manufacturers to use imports is the high prices of Russian analogues, probably aggravated by diminishing purchasing power of the Russian population. Note also that the aforementioned companies relatively often set up their own import substituting production.

11. Successful companies whose technological level is higher than their competitors', and those who export their products (at least in the former USSR republics) tend to have a higher degree of import dependence. In effect this makes such companies more vulnerable to all limitations of imports, external and internal alike.

12. Companies facing strong competition on the domestic market from foreign producers tend to depend on imports more than others. High-technology firms face especially strong competition from imports [*Zudin*, 2015]. This forces Russian producers to impose strict requirements to products, technologies, and services they use in their production processes, which foreign suppliers are more likely to meet. Alternatively, companies borrow successful international practices.

Certain observations and recommendations

Import substitution is a quite common area of economic policy in many countries. There is nothing new about it in Russia either, where this topic, in one form or another, has been relevant since the early 1990s. At first, import substitution policy concentrated on aircraft construction, then on agriculture, automobile industry, and pharmaceuticals. Success achieved in these fields requires, at the very least, a thorough economic evaluation and discussion. However, some qualitative changes achieved in certain industries are very important, such as the groundwork necessary for retaining competencies and promoting development of specific sectors (aircraft construction); demonstrating potential of alternative development schemes based on attracting foreign investors and localising production (automobile industry); achieving positive dynamics in dealing with socially sensitive issues (agricultural sector, pharmaceuticals).

In our view, the import substitution strategy being implemented in Russia is aimed not so much at meeting requirements of the economy as a whole as serving the interests of specific "backbone" companies; not so much at diversifying and upgrading the Russian economy as dealing with national security objectives. It is hard to determine the reasons for such priority setting: on the one hand, it reflects economic positions of large Russian monopolies and state corporations, while on the other, the security aspect has always served as an excellent argument to promote various new government support programmes and initiatives. The course towards import substitution could have been chosen due to the government's aspiration to deal with several types of objectives: economic ones (increasing added value on the scale of the whole national economy); innovation (e.g., vertical modernisation of the production chains); sovereignty-related (in particular, ensuring the country's technological independence). All these objectives are optimisation ones because they cannot be accomplished completely: you cannot create all added value within the national economy created by a particular sector, and it would be impossible to achieve total technological independence. However, the issue of limits and forms which would make import substitution policy beneficial for the economy, in the medium and long terms, is quite relevant. Of course, unfavourable developments require quick reactive action, frequently in "manual control" mode, but in economic policy shaping, immediate considerations should be separated from systemic issues

and proactive measures. Attempts to apply strategic tools to deal with 'tactical' high-precision, specific objectives usually involve a high risk of bad bargain.

It is important to make sure that import substitution does not turn into an economic policy goal, as opposed to being its tool. Most of the previous attempts to pursue an industrial policy in Russia were aimed, directly or indirectly, at maximising the share of added value generated inside the country – which determined predominant focus on the domestic market, with all related risks of protectionism, limitations on competition, and demand by the public sector replacing that by the private one [*Dranev et al.*, 2014]. Meanwhile, just about all examples of successful import substitution policies in other countries implied focusing on global markets, making national economies more open, increasing their export potential, and bringing in strategic foreign investors. Therefore, in our opinion, an efficient import substitution policy does not exclude, but on the contrary, requires accomplishing, in a coordinated way, the objectives of integrating Russian producers into global added value chains, encouraging inflows of advanced knowledge and competencies in the Russian economy, and establishing international technological alliances [*Simachev et al.*, 2014a].

The results of our study show yet again that the micro (company-level) scale should be taken into account together with macro-level data when an import substitution policy is designed, among other things, to anticipate companies' probable reaction to various initiatives. The motives of companies who opt for imported products and technologies over Russian analogues (when the latter are even available) should be considered. This would help to identify major bottlenecks with domestic supply, to concentrate the government's efforts on eliminating them by means of the import substitution policy.

Our empirical analysis allowed us to identify the factors which require priority attention — namely the very different nature of import dependence in various sectors of the economy, markets, and companies of different sizes. Accordingly, the degree of companies' import dependence and their motivations to use import becomes very different. Therefore, different tools for encouraging import substitution should be applied in each specific case, to achieve the desired results efficiently. The effectiveness of standardised, universal solutions here is limited by definition; in addition, import substitution promotion measures need to be constantly adjusted, and a political will to abandon obsolete mechanisms is required.

The idea to introduce targets for a reduced share of imports for specific industries does not seem sensible. The level of companies' import consumption as such is not particularly important without taking into account its contribution to their competitiveness. Much more significant is the issue of businesses' stability when the external environment and market situation change, and the link between import dependence and broadly understood national security aspects, including medical, food and information security, etc. Therefore, when designing and implementing import substitution policy it is critically important to consider not only quantitative indicators reflecting the volume of imports and their share in apparent consumption, but also qualitative import dependence characteristics. In reality, even a significant volume of imports does not always mean high import dependence, and vice versa — a formally modest volume of imports may be crucial if no affordable alternatives to such products, technologies, or services are available.

Since the key reason for using imported products, technologies, and services is the lack of Russian analogues on the market, even taking into account that some of the respondents may have been simply unaware of existing alternatives, at this stage it would not be possible to fully resolve the import dependency problem by switching to a Russian supply. Therefore, the emphasis of import substitution policy should be placed not on the quickest possible overall reduction of the share of imports in Russian companies' consumption, but on setting up new competitive production facilities. Furthermore, demanding quick results would be very short-sighted, and even harmful.

Different categories of consumption, and therefore different sectors generating demand, require different import substitution models. For example, in case of imported modules and aggregates, the issue of Russian analogues' not being able to match relevant technological requirements comes to the foreground. Here an efficient strategy to reduce relevant companies' import dependence would be launching one's own production of the required products. The government's attempts to promote the procurement of Russian-made modules and aggregates with price-based incentives would be unlikely to succeed; it would make more sense to help launch the production of the relevant advanced products in Russia, designed in the country or elsewhere. As to the reasons companies opt for imported technologies, the high prices of Russian analogues play an important role here, combined with Russian developers' traditionally inadequate attention to specific customers' needs and requirements, and companies' insufficient awareness of domestic supply [*Simachev at al.*, 2014b]. Accordingly, the emphasis of government policy to promote the application of Russian technologies should be placed on subsidising their procurement by manufacturing companies, developing the R&D sector players' competences for working with the business sector clients, and for promoting the advanced technological solutions they offer among potential customers.

Our analysis revealed that high-technology and export-oriented companies tend to have the highest degree of import dependence. In their case, it is primarily due to the lack of Russian alternatives, or the latter's low quality and/or inability to meet companies' technological requirements. Therefore, steps to enforce import substitution — tough or soft ones (such as recommendations) alike — can hinder the

diversification of the economy, growth of high-technology exports, and technological modernisation. Helping Russian producers create or extend the supply of import-substituting products, technologies, and services should not turn into discrimination of consumer companies, particularly since, as our study reveals, successful high-technology firms would have the highest chances of being discriminated against. Attempts to thrust Russian products and technologies on companies using administrative methods, customs and tariff regulation, or by other means would almost inevitably result in their reduced competiveness, first of all, for leader companies. Therefore, any "enforced import substitution" appears to be harmful, fraught with adverse economic consequences.

Russian import substitution policy commonly involves attempts to restore, upgrade, and build missing *production* elements of the national economy, i.e., it has a predominantly *vertical* nature. However, without accompanying horizontal steps to promote the development of specific critical technologies and the emergence of new areas of knowledge, develop missing research competences, it would have an inevitablly limited "shelf life", it would systematically lag, and focus mainly on price competitiveness. All this generates an expansion of an economy that is highly sensitive to currency fluctuations. On the contrary, a *proactive import substitution policy* is needed, which is focused on emerging markets.

This paper is based on, and further advances the results of the study "Monitoring and analysis of research and human potential of Russian R&D organisations focused on the development of import-substituting critical technologies, and preparing proposals on providing S&T and personnel support for projects aimed at setting up and developing import substituting production" (unique project identifier: RFMEFI57315X0010), carried out by OJSC "Inter-Departmental Analytical Center" funded by a subsidy provided by the Russian Ministry of Education and Science.

References

Amsden A. (2004) Import substitution in high-tech industries: Prebisch lives in Asia! *CEPAL Review*, vol. 82, pp. 75–89.

Aschhoff B. (2010) Who gets the money? The dynamics of R&D project subsidies in Germany. *Journal of Economics and Statistics*, vol. 230, no 5, pp. 522–546.

Baer W. (1972) Import Substitution and Industrialization in Latin America: Experiences and Interpretations. *Latin American Research Review*, vol. 7, no 1, pp. 95–122.

Berezinskaya O., Vedev A. (2015) Proizvodstvennaya zavisimost' rossiiskoi promyshlennosti ot importa i mekhanizm strategicheskogo importozameshcheniya [Dependency of the Russian Industry on Imports and the Strategy of Import Substitution Industrialization]. *Voprosy Ekonomiki,* no 1, pp. 103–115 (in Russian).

Bodrunov S., Rogova E. (2014) O bazovykh printsipakh formirovaniya importozameshchayushchei promyshlennoi politiki v Rossii [On basic principles of import substituting industrial policies in Russia]. *Aktual'nye problemy ekonomiki i upravleniya,* no 4 (4), pp. 7–12 (in Russian).

Bravo A., Álvarez M. (2012) The import content of the industrial sectors in Spain. *Banco de Espana Economic bulletin*, April, pp. 81–92. Available at: http://www.bde.es/f/webbde/SES/Secciones/Publicaciones/InformesBoletinesRevistas/BoletinEconomico/12/Abr/Files/art3e.pdf, accessed 12.05.2016.

Bruton H. (1998) A Reconsideration of Import Substitution. *Journal of Economic Literature*, vol. 36, pp. 903–936.

Chenery H., Syrquin M. (1975) *Patterns of development: 1950–1970*, London: Oxford University Press.

Cristobal K. (1990) *Reflections on the Latin American Contribution to Development Theory* (Working Paper no 82), Rotterdam: Institute of Social Studies. Available at: repub.eur.nl/pub/18931/wp82.pdf, accessed 23.05.2015.

Debowicz D., Segal P. (2014) Structural Change in Argentina, 1935–1960: The Role of Import Substitution and Factor Endowments. *The Journal of Economic History*, vol. 74, no 1, pp. 230–258.

Demidenko S. (2015) Importozameshchenie: Opyt Azii [Import substitution: Asian Experience]. *Praktika upravleniya,* no 4, pp. 22–25 (in Russian).

Dranev Ya., Kuznetsov B., Kuzyk M., Pogrebnyak E., Simachev Yu. (2014) *Opyt realizatsii promyshlennoi politiki v Rossiiskoi Federatsii v 2000-2012 gg.: institutsional'nye osobennosti, gruppy interesov, osnovnye uroki* [Experience in Implementing Industrial Policy in the Russian Federation in 2000-2012: Institutional Features, Interest Groups, Main Lessons], Moscow: RANEPA. Available at: http://ssrn.com/abstract=2443928, accessed 05.08.2016 (in Russian).

Fal'tsman V. (2015) Forsirovanie importozameshcheniya v novoi geopoliticheskoi obstanovke [Forcing the implementation of import substitution in the new geopolitical environment]. *Problemy prognozirovaniya,* no 1, pp. 22–32 (in Russian).

Fier A., Heneric O. (2005) *Public R&D Policy: The Right Turns of the Wrong Screw? The Case of the German Biotechnology Industry* (ZEW Discussion Paper no 05-60), Mannheim: Centre for European Economic Research (ZEW).

Franko P. (2007) *The Puzzle of Latin American Economic* (3rd ed.), Lanham, MD: Rowman & Littlefield Publishers, Inc.

Gorodnikova N., Gokhberg L., Ditkovskii K., Kuznetsova I., Lukinova E., Martynova S., Ratay T., Rosovetskaya L., Fridlyanova S. (2016) *Indikatory innovatsionnoi deyatel'nosti: 2016: statisticheskii sbornik* [Indicators of Innovation in the Russian Federation: 2016: Data Book], Moscow: HSE (in Russian).

Irisova O. (2013) Inogda oni vozvrashchayutsya [Sometimes they come back]. *World Economic Journal* (electronic journal). Available at: http://world-economic.com/ru/articles_wej-332.html, accessed 18.04.2016. (in Russian).

Ivanov D., Kuzyk M., Simachev Yu. (2012) Stimulirovanie innovatsionnoi deyatel'nosti rossiiskikh proizvodstvennykh kompanii: novye vozmozhnosti i ogranicheniya [Fostering Innovation Performance of Russian Manufacturing Enterprises: New Opportunities and Limitations], *Foresight-Russia,* no 2, pp. 18–41 (in Russian).

Kaushan K., Bogushevskii S. (2009) Integratsiya kak forma adaptatsii rossiiskikh predpriyatii k sovremennym rynochnym usloviyam [Integration as a form of Russian enterprises adaptation to the current market conditions]. *Vestnik Volgogradskogo gosudarstvennogo universiteta, Seriya 3: Ekonomika. Ekologiya,* no 2, pp. 138–141 (in Russian).

Kondrat'ev A. (2014) Importozameshchenie: dve storony odnoi monety [Import substitution: Two sides of the same coin]. *Biznes Rossii* (electronic journal). Available at: http://businessofrussia.com/dec-2014/item/975-kondratyev.html, accessed 21.02.2016 (in Russian).

Kozyreva E., Novikova N. (2015) Opyt realizatsii politiki importozameshcheniya i eksportnoi orientatsii v zarubezhnykh stranakh [Experience of import substitution policy in Brazil and Taiwan]. *Vestnik TvGU/Seriya: Ekonomika i upravlenie,* no 3, pp. 241–247 (in Russian).

Kravchenko N. (2015) Istoriya importozameshcheniya [History of import substitution]. *ECO*, no 9, pp. 73–91 (in Russian).

Kurre J. (2011) *Building Erie by Buying Erie: An Import Substitution Strategy for Erie County*, Erie, PA: Economic Research Institute of Erie, Penn State Erie, The Behrend College. Available at: http://www.planerieregion.com/uploads/PDF/Import%20Substitution%20Strategy%20Building%20Erie%20By%20Erie.pdf, accessed 17.05.2016.

Kvashnina I., Obolenskii V., Shuiskii V. (2013) *Vneshneekonomicheskie faktory modernizatsii rossiiskoi ekonomiki* [External economic factors of the Russian economy modernization], Moscow: RAS Institute of Economics. Available at: http://inecon.org/docs/Obolensky_paper_2013.pdf, accessed 21.02.2016 (in Russian).

Kwon J. (2010) *Import Substitution at the Regional Level: Application in the United States*, Atlanta: Federal Reserve Bank of Atlanta. Available at: http://www.frbatlanta.org/documents/news/conferences/10smallbusiness_kwon.pdf, accessed 17.05.2016.

Mekhanik A. (2013) Stanok dlya novogo uklada [The machine tool for the new mode]. *Ekspert* (electronic journal), no 7 (839). Available at: http://expert.ru/expert/2013/07/stanok-dlya-novogo-uklada/, accessed 19.04.2016 (in Russian).

Narula R. (2002) *Switching from Import Substitution to the New Economic Model in Latin America: A Case of Not Learning from Asia* (Strategic Management Society Working Paper no 4), Maastricht: Maastricht University.

Neprintseva E. (2006) Vertikal'naya integratsiya: stimuly i preimushchestva [Vertical integration: Incentives and benefits]. *Upravlenie kompaniei,* no 7, pp. 73–76 (in Russian).

Ogujiuba K., Nwogwugwu U., Dike E. (2011) Import substitution industrialization as learning process: Sub Saharan African experience as distortion of the "good" business model. *Business and Management Review*, vol. 1, no 6, pp. 8–21.

Panicz U. (2015) Reshoring as a form of relocation of economic activity – US firms case study gaining (Chapter 9). *Enterprises in Unstable Economy* (ed. B. Prusak), Gdansk: Gdansk University of Technology, pp. 94–107. Available at: ftp://ftp.zie.pg.gda.pl/RePEc/gdk/chapte/ENTIME2015_CH_9.pdf, accessed 12.07.2016.

Pobyvaev S., Tolkachev S. (2015) Reindustrializatsiya v ES i SShA [The re-industrialization in the United States and the EU]. *World of New Economy,* no 2, pp. 29–36 (in Russian).

Prebisch R. (1950) *The Economic Development of Latin America and Its Principal Problems // Economic Commission for Latin America*, Lake Success, NY: United Nations Department of Economic Affairs. Available at: http://archivo.cepal.org/pdfs/cdPrebisch/002.pdf, accessed 18.06.2015.

Rodrigues M. (2005) Import Substitution and Economic Growth. *Journal of Monetary Economics*, vol. 57, no 2, pp. 176–188.

Simachev Yu., Kuznetsov B. (2014) Evolutsiya gosudarstvennoi promyshlennoi politiki v Rossii [Evolution of State Industrial Policy in Russia]. *Journal of the New Economic Association*, no 22, pp. 152–179 (in Russian).

Simachev Yu., Kuzyk M., Feigina V. (2014b) Vzaimodeistvie rossiiskikh kompanii i issledovatel'skikh organizatsii v provedenii NIOKR: tretii ne lishnii? [R&D Cooperation between Russian Firms and Research Organizations: Is There a Need for State Assistance?]. *Voprosy Ekonomiki,* no 7, pp. 4–34 (in Russian).

Simachev Yu., Kuzyk M., Kuznetsov B., Pogrebnyak E. (2014a) Rossiya na puti k novoi tekhnologicheskoi promyshlennoi politike: sredi manyashchikh perspektiv i fatal'nykh lovushek [Russia on the Path Towards a New Technology Industrial Policy: Exciting Prospects and Fatal Traps]. *Foresight-Russia*, vol. 8, no 4, pp. 6–23 (in Russian).

Tsukhlo S. (2015) Teper' bez emotsii: chto meshaet importozameshcheniyu v Rossii [No emotion: What hinders the implementation of import substitution in Russia]. *RBK* (electronic journal). Available at: http://www.rbc.ru/opinions/economics/28/10/2015/56309c699a7947c537e05f9e, accessed 30.04.2016 (in Russian).

Vatolkina N., Gorbunova N. (2015) Importozameshchenie: zarubezhnyi opyt, instrumenty i effekty [Import substitution: international experience, instruments and effects].*St. Petersburg State Polytechnical University Journal. Economics,* vol. 6, no 233, pp. 29–39 (in Russian).

Zhu T. (2006) *Rethinking Import-substituting Industrialization. Development Strategies and Institutions in Taiwan and China* (UNU-WIDER Research Paper no 76), Helsinki: UNU-WIDER.

Zil'berman M., Strovskii L. (2009) Vliyanie obmennogo kursa na protsess importozameshcheniya v usloviyakh mirovogo finansovogo krizisa [Impact of the exchange rate on the process of import substitution in the context of the global financial crisis]. *Bulletin of Ural State Technical University. Series Economics and Management,* no 3, pp. 75–82. (in Russian).

Zudin N. (2015) Vzaimosvyaz' tekhnologicheskogo urovnya sektora s kharakteristikami kompanii i gosudarstvennoi podderzhkoi [Relationship of the technology level of sector with company characteristics and public support]. *Innovations,* no 6, pp. 61–70 (in Russian).