

## What explains the product differentiation of Russian companies: competitive pressure or technological spillovers?

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### Summary

The empirical literature devoted to the estimation of competitive pressure and spillovers from imports and FDI is concentrated on the effect on the labor productivity of domestic companies and is mostly silent on the introduction of new products. We focus on comparing the influence of competitive pressure and spillovers imports and FDI on the product innovation of Russian companies.

Empirical estimation is based on a previously developed theoretical model. The model allows for the identification of several groups of factors that influence product innovation and product variety in domestic companies: characteristics of demand (size, new market segment), firm characteristics (employment, educational level of employees, technological gap with the market leader), competition pressure (from domestic, importing and foreign-owned firms), and technology transfer channels.

We find that Russian firms perform product, rather than process or managerial, innovations. Among the former, horizontal product innovations (introduction of new product variety rather than improving quality) account for the largest share.

We find that competitive pressure from the domestic companies, demand change, product and process technology transfer contribute the most to the innovation activity at the firms. Moreover, the innovation rate is higher for larger than for smaller firms.

Competitive pressure is a more significant factor for product innovation than spillovers.

### What is known

There are two types of indirect effect from imports and FDI on the domestic companies: competition effect and spillovers. The competition effect takes place when increase in imports and inward FDI forces domestic companies to *introduce on their own* completely new products or modify previously produced products giving companies some monopoly power. The spillovers from imports and FDI can be realized through *imitation* of technologies, products, organizational systems or specialist turnover.

There are no empirical estimates of the relative importance of these two effects for product innovation of domestic companies. The research closest to ours, done by Carlin, Fries, Schaffer and Seabright (2001) surveys 3300 firms in 25 transition countries. The authors conclude that a domestic company's decision to introduce new product does not depend on the number of competitors, but there is positive correlation between product innovation and the perceived intensity of competition from both domestic and foreign firms.

### Data description

We surveyed 160 firms from four oblasts of the Ural region: Sverdlovsk, Perm, Cheljabinsk and Tjumen. The firms belong

to three industries: perfume/cosmetics and household chemicals, furniture and food production. The average employment is 210 employees.

All enterprises in our sample are manufacturers. We excluded all firms reporting trade among their business activities because we believe that they are mostly trading companies. The majority of such firms were from the food industry.

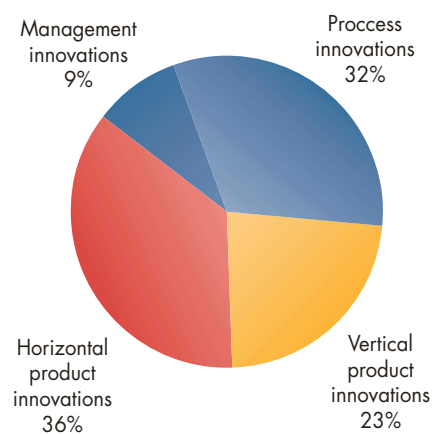
Survey questions covered innovation activity at the enterprises, perceived incentives to innovate, and firm performance.

The interview covered the period 2000–2003.

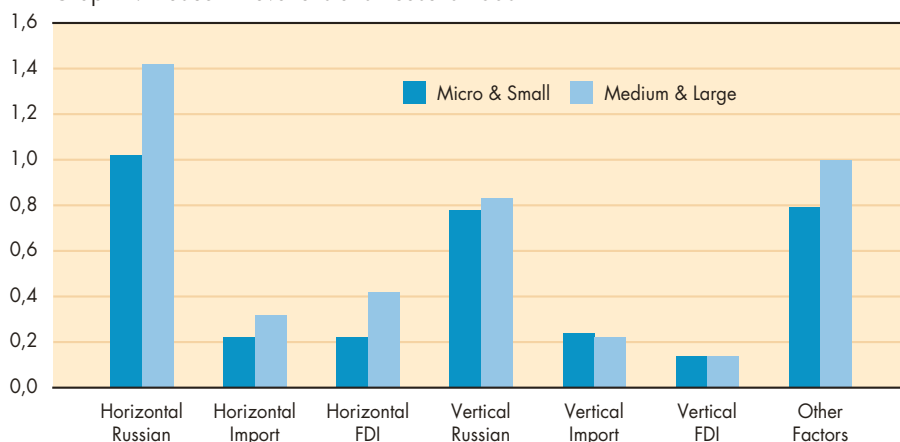
### Empirical findings

We analyze product innovations because they are the dominant type of all innovations implemented (Chart 1). The possible reason for this is that it does not require

Chart 1

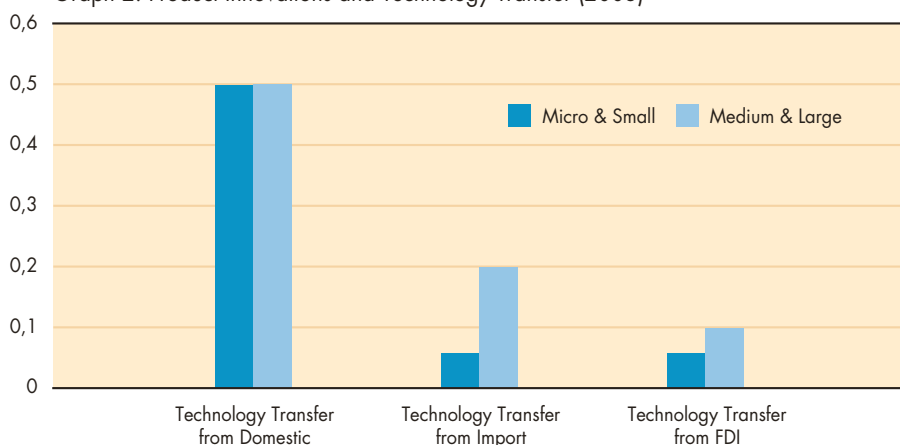


Graph 1: Product Innovations and Reasons 2003<sup>1</sup>



<sup>1</sup> Horizontal competition from Russian firms that produce the same product as the firm-respondent.  
 Horizontal competition from importers that produce the same product as the firm-respondent.  
 Horizontal competition from FDI firms that produce the same product as the firm-respondent.  
 Vertical linkages with Russian firms: increase in the quality of input or the new requirements on the output.  
 Vertical linkages with importers: increase in the quality of input.  
 Vertical linkages with FDI firms: increase in the quality of input or the new requirements on the output.  
 Other Factors: change in demand, appearance of a new segment on the market, new aim of the firms, willingness to attract foreign investment into the firm.

Graph 2: Product Innovations and Technology Transfer (2003)



large capital investments process innovations and is probably more efficient in competition than management innovations.

The number of innovations implemented by the firm varies significantly with respect to the type of competitive pressure and the technology transfer channels (Graph 1, Graph 2).

As we can see from the graphs the biggest incentive to innovate comes from Russian companies: horizontal competition and vertical linkages, technology transfer. The second biggest incentive is “other factors” that include change in demand, change in the goals of economic activities of firm, etc. The competitive pressures from imports and

FDI are at the same low level, which can be explained by the low number of foreign companies in the Russian market.

Not surprisingly, larger firms carry out more innovations because they have more resources to do so and because they are capable of gaining monopoly power after introducing new products. They also can effectively defend this power through patents and advertising.

The next step was to use econometric analysis to identify factors that influence the product innovation activity (vertical and horizontal product innovations) and product proliferation at domestic firms.

We found that none of the technology transfer channels are correlated with product innovation. Among the competitive pressure factors, only vertical linkages with other domestic companies play a significant role. The effect is positive: higher quality of the domestically produced input and stricter requirements on the output quality by domestic buyers stimulate the product innovations.

Considering vertical and horizontal product innovations separately we found that vertical linkages with other domestic companies and increase in demand push domestic firms toward horizontal product innovation, whereas the technological distance from the most advanced competitor compels domestic companies to implement vertical product innovations. Higher employment is correlated with more vertical product innovations.

Firms can implement vertical and horizontal product innovations simultaneously. In our sample these firms account for 42% of all firms implementing product innovations. For these firms horizontal competition increases propensity to innovate at the same rate as vertical linkages with domestic companies.

Turning to the product variety we find that only horizontal competition from other domestic companies is correlated with the firm’s number of products. Surprisingly, product variety is lower in larger firms and firms with higher share of employees with higher education. The presence of the technological gap has a positive influence on product proliferation, which might reflect the existence of positive spillovers on the market.

The summary of the econometric analysis is represented in Table 1.

Table 1

	Vertical	Horizontal	Vertical & Horizontal	Product Proliferation
Demand increase		+	+	
Technological gap	+			+
Employment				-
Education	-			-
Horizontal competition from domestic companies			+	-
Vertical linkages with domestic firms		+	+	

## Policy recommendations

Based on our results we conclude that more protection would not have a positive effect on domestic companies. Current competitive pressure from foreign companies is very low and perceived as insignificant.

Moreover, the complicating entry of foreign companies discourages domestic companies from innovating because foreign companies bring new technologies and new products on the market stimulating product quality improvement in domestic companies (consider positive effect of technological gap).

Liberal competition policy stimulates the innovation activity of domestic companies

Finally, domestic companies are encouraged to innovate by competition rather than technological spillovers per se.

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