

Stuck between Surplus and Shortage: Demand for Skills in Russian Industry

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Abstract. In order to remain competitive, firms need to keep the quantity and composition of jobs close to optimal for their given output. Since the beginning of the transition period, Russian industrial firms have been widely reporting that the quantity and composition of hired labour is far from being close to optimal. This paper discusses what kinds of firms in the Russian manufacturing sector are unable to optimize their employment and why. The main conclusion is that the key issue is an excess of non-viable firms and a shortage of highly efficient firms because of weak selection mechanisms. The major solution is seen in creating institutional conditions that stimulate a more efficient reallocation of labour. The analysis presented in this paper is based on data from a large-scale survey of Russian manufacturing firms.

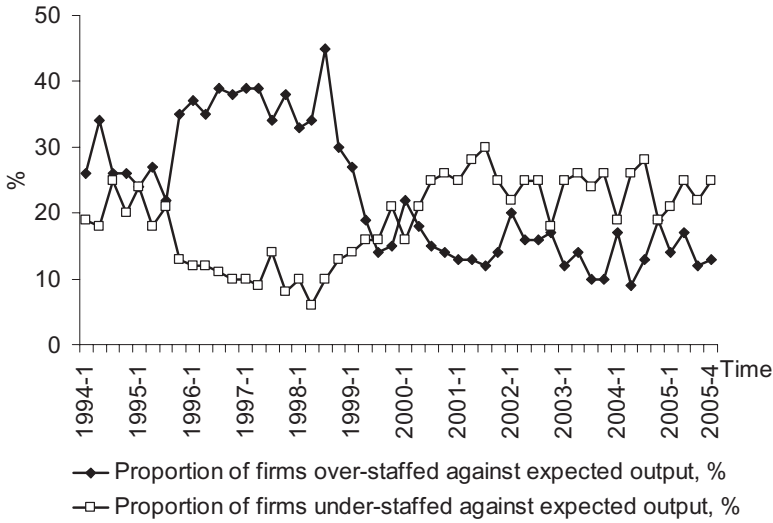
1. Introduction

During the transition to a market economy, the Russian workforce underwent a drastic reallocation across industries and occupations.¹ Many specialized and technical skills previously acquired by workers during the central planning period have become partially or fully depreciated, and are no longer in demand by the manufacturing sector. Skill mismatches in the labour market have become widespread, with sharp shortages of some types of skilled workers coexisting with excess supplies of others. The educational system and specialized vocational and technical training institutions in particular seem to be poorly prepared to operate under the new market conditions and to supply skills that are required by the market.

A planned economy is sometimes referred to as an economy of shortage (Kornai, 1992). With the start of transition in the early 1990s, the labour shortage in the Russian labour market abruptly turned into a surplus and expressed itself in growing unemployment and underemployment. By early 1999, unemployment reached 13–14 per cent, the annual number of hours worked in industry shrank by 10 per cent, the real wage lost two-thirds of its value, and complaints by firms of excess labour became universal. According to Figure 1, based on quarterly data from the Russian Economic Barometer (REB) surveys, the proportion of firms

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Figure 1. Over- and under-staffing in Russian industrial enterprises

Source: REB.

reporting excess labour relative to expected output was always high prior to the 1998 financial crisis. Over 40 per cent of firms noted that they had redundant personnel during that period. In comparison, only 5–10 per cent of firms in the sample reported under-staffing relative to expected output.

The post-crisis (since 1999) economic recovery changed the picture drastically. GDP growth activated labour demand, improving all aspects of labour use and stimulating rapid wage growth. However, industrial employment increased in 1999–2001 only marginally, and then returned to a downward trend, thus showing no reaction to the significant economic growth. As a result, from 1999 to mid-2008, the proportion of enterprises reporting labour surpluses was declining, whereas the proportion of firms complaining about labour shortages was increasing. Strong recovery in industrial output brought the proportion of over-staffed firms down to less than 10 per cent. Meanwhile, the proportion of firms reporting that they were under-staffed for expected output started to grow. In 2005, almost every fourth industrial firm reported under-staffing against expected output, whereas less than 10 per cent anticipated excess labour. According to another survey, under-staffed enterprises made up over 40 per cent, whereas the proportion of over-staffed enterprises was close to zero (Gimpelson, 2004). The general consensus that labour and skill shortages constituted a major constraint on output emerged. Long-term demographic projections showing a decline in the workforce complemented the picture.

This paper aims to shed light on how ‘optimal’ employment is in the Russian manufacturing sector and to investigate what the scale, composition, and determinants of labour surplus and shortage are. It uses the Russia Investment Climate Survey (ICS), which provides detailed insights into these issues. In the next section we describe the approach that we took in the paper and the data used. Section 3 characterizes the distribution and nature of over-staffing and under-staffing for different occupational groups of manufacturing firms. In Section 4, we analyse reasons for reported staffing problems, including labour turnover and compensation

policies. Section 5 turns to a discussion of various strategies for enterprises to meet their staffing and skill needs. The final section concludes with some policy implications.

2. Our approach and data

Before moving to the empirical part of the paper, we need to clarify our understanding of what we call labour ‘excess’ and labour ‘shortage’. There are no ideal measures for these concepts. Both ‘excess’ and ‘shortage’ measures are often derived from managers’ subjective responses to special surveys. This allows for identification of firms recording non-optimal employment, the size of the deviation of employment from the optimum, the distribution of ‘excess’ or ‘shortage’ firms by their structural (industries, regions, ownership forms, firm age and size), and performance-related (productivity, profitability, etc.) characteristics. For measuring excess, we can also look at objective indicators such as employer-initiated separations (firings), and for capturing shortage, we can examine vacancy rates. However, vacancy statistics are usually far from being complete and fully reliable, whereas the wide use of downsizing critically depends on the stringency of employment protection legislation and its enforcement. Although these caveats apply, self-reported measures are often the only tools available for an in-depth analysis of labour shortage/excess issues.

Frequent and loud complaints about the shortage of skilled workers and engineers voiced by managers can be interpreted as an implicit indication of chronic labour market disequilibrium. If demand exceeds supply, then wages should rise in reaction to this shortage, thus boosting supply and containing demand. If wages are fixed by the government and are thus rigid, as was the case in the planned economy, then labour shortages become an ingrained systemic feature. However, if wages are flexible — and they are extremely flexible in the Russian labour market — the shortage story does not seem so convincing and needs a special explanation.² One possible explanation relates to the complex interaction between the demand curve, which is rapidly shifting upward, and the increase in prices. This interaction, which is institutionally mediated, may hinder the market in achieving equilibrium.

In the 1950s, the US economy experienced what was called ‘a shortage of engineers and scientists’. This gave rise to various proposals for government intervention into the market’s determination of labour quantities and their allocation. Reacting to this problem, Arrow and Capron (1959) wrote that:

these views stem from our misunderstanding of economic theory as well as from an exaggeration of the empirical evidence. On the contrary, a proper view of the workings of the market mechanism, recognizing, in particular, the dynamics of market adjustment to changed conditions, would show that the phenomenon of observed shortage is exactly what would be predicted by classical theory in the face of rapidly rising demands.

A ‘shortage’ emerges when demand for labour rises (seen as a growing alternative wage) but the reaction speed of firms in hiring new workers at a higher wage rate is slow.

The reaction speed in any particular market depends partly on institutional arrangements, such as the prevalence of long-term contracts, and partly on the rapidity with which information about salaries, vacancies, and availability of personnel generally available throughout the market. (Arrow and Capron, 1959, p. 301)

The main conclusion from that study was that to deal with ‘shortages’ more efficiently, the institutional environment should help firms to respond more rapidly by containing costs that arise in dynamic adjustment to growing demand. In other words, if market clearing wages rise rapidly, institutions may induce a ‘shortage’.

One of the recent outbursts of ‘labour shortage’ claims is discussed by Freeman (2006). He denies these claims, which he believes are based on flawed logic. But aside from the logic, there are vested interests that may also matter. Freeman introduces a political-economy dimension into this dispute by arguing that:

fears of a coming shortage fit with the concerns of various groups. Future shortage or not, business will benefit from policies that increase labour supply to drive down labour costs. Advocates of education and training see the shortage analysis as a way to gain national support for increased spending on training that will benefit workers. Politicians can use the shortage analysis to avoid dealing with policies like minimum wages, mandated health care spending, labour law reform, or enforcement of labour laws, and the like, by endorsing ‘win-win’ education and training policies while sidestepping the fact that someone must pay for these investments. (Freeman, 2006, p. 19)

As the incidence and scale of shortage usually cannot be estimated directly via reliable and objective variables, self-reported measures remain the main evidence on these issues. If managers say that their firms are experiencing a ‘shortage’, then this opinion is usually accepted without an additional check. By aggregating individual responses, we can get a general idea of the total ‘shortage’ that emerges as ‘a major threat’ to economic growth (Rutkowski, 2007). This conclusion is then likely to be disseminated by industry analysts, education and training experts, mass-media, and politicians. In the context of a non-transparent labour market, this adds to upward wage pressure.

Although self-reported measures are clearly very important and now widely used by economists, there is a risk of missing the complete picture by listening to what managers (firms) say while ignoring what they in fact do. What they do may reflect what they think, but their actual behaviour is also shaped by many other explicit and implicit factors, including those that are performance related. Here we follow the methodological suggestion that ‘by expanding our direct observation of what businesses do and how managers’ thought processes conditions those actions, we should be able to gain additional insights’ (Hamermesh and Pfann, 1996). We also believe that these two dimensions — subjective (what managers say) and objective (what firms do) — should be taken together and analysed jointly. This approach sheds more light than any of the two dimensions taken separately and it defines the direction we follow in this paper.

We rely on data from the Russia ICA survey (ICS) of large- and medium-sized manufacturing firms. The survey was conducted by the World Bank and the Higher School of Economics in the second half of 2005.³ The questionnaire used in that survey is standard for Investment Climate Surveys (now called Enterprise Surveys) that the World Bank has conducted in many countries. This survey *de facto* includes two subsurveys: one of large- and medium-sized enterprises (firms with at least 100 employees) and another one for small firms. As the Russian manufacturing sector consists mainly of large- and medium-sized firms, we do not incorporate the small firms survey into this paper. The stratified random sample contains around 1000 firms across Russia and is representative for the total population of Russian manufacturing enterprises. Selected firms are located in 49 regions and make 5 per cent of all manufacturing firms in the country. Data collection combined standardized interviews with

top-managers and objective economic and financial information about firms taken from their statistical reports and balance sheets. The main descriptive statistics of the sample are presented in Table A1 in the Appendix.

Microdata reflecting managers' reactions allow analysing how the incidence of non-optimal staffing (in general as well as by skill group) is associated with firms' performance and how firms react to this non-optimality (shortage/excess). In a competitive environment, a shortage is likely to be a short-term phenomenon and positively associated with rapid growth and dynamic job creation whereas non-zero adjustment costs work as brakes on hiring. In this sense, a reported labour shortage can be 'a binding constraint to firm expansion' (Rutkowski, 2007).

If a labour shortage emerges as a consequence of rapid growth, then our hypotheses seem to be quite clear-cut. We can expect that firms reporting shortages are likely to have higher marginal productivity, meet higher demand for their products, offer higher wages (in order to attract better candidates), have higher level of labour use, and invest more in on-the-job training. On the contrary, excess labour firms are expected to report lower productivity, reduce wages (compared with the outside world) in order to stimulate quitting, freeze new hirings and contain training-related investments. Further in this paper, we will check whether these standard expectations fit the actual behaviour of Russian manufacturing firms and will show that the reasons for non-optimal staffing are different.

3. Shortage and surplus: where and how much?

We begin our analysis of the survey data with a simple description of what respondents said about the optimality of current employment in their firms relative to current output.

3.1 Scale of shortage and surplus

The distribution of answers reporting a deviation of current employment from what managers would consider the 'optimal' level given current output is presented in Table 1. A sizeable fraction of Russian enterprises had difficulty in adjusting the size of their workforce to the staffing levels dictated by their current output. In the 2005 Russia ICS, about 60 per cent of surveyed firms rated their current staffing levels as 'optimal'. However, 27 per cent of managers reported that their firms were 'under-staffed' and 13 per cent reported 'over-staffing'. This made the ratio of firms with less-than-optimal staffing to firms with more-than-optimal staffing around 2 to 1. Based on these estimates, one might conclude that in the Russian manufacturing sector, the problem of labour shortage is significantly more acute than that of surplus.

Table 1. Distribution of enterprises by the optimality of staffing

Question: 'Given the current output of your firm, how would you evaluate the current employment?'	% of firms
It is optimal	59.8
The firm needs more employees than it actually employs (actual employment is lower than optimal)	27.3
The firm employs more employees than it actually needs (actual employment is above)	12.9
N of firms	990

Note: The non-response rate was very small (1 per cent) and is not shown in the table.

Although firms reporting a labour shortage prevailed compared with firms with a labour surplus, they were generally smaller in size if measured by the number of employees. This hints at the fact that a labour shortage in some firms does not mean a labour shortage for the sector in general. Meanwhile, this suggests that these groups may face higher adjustment costs.

Table 2 shows how far firms of both types were from their optimal employment size. The mean deviations are close whereas the medians are similar. On average, under-staffed firms were short of personnel by 17 per cent, whereas over-staffed firms had 15 per cent more workers than they currently needed. The size distribution of the first group's deviation from optimal employment is biased to the left in comparison with the second group. The only reason that the mean shortage exceeds the mean surplus is because three firms reported a labour shortage in excess of 100 per cent of their actual employment. If these three particular outliers are excluded, the two subsample means become almost equal. It is worthwhile to add that over-staffed firms are on average around 1.5 times larger than under-staffed firms. As a result, the difference between the total quantity of shortage (the sum of insufficient workers over all firms reporting shortage) exceeds the total quantity of surplus (the sum of redundant workers over all firms reporting excess) by only 17 per cent. This may mean that the problem of labour misallocation is much more general than merely a labour shortage problem. (Evidently, occupational and skill characteristics of the excess and shortage may also vary significantly.)

Enterprises are concerned not only with overall staffing levels, but also with having the desired skill mix. This is borne out by which firms report under-staffing or over-staffing in several occupational groups: managers, professionals, other white-collar employees, blue-collar skilled workers, and unskilled workers (Table 3). Among the surveyed firms, 95 per cent, 81 per cent, 98 per cent, and 88 per cent did not report any shortage of managers,

Table 2. Distribution of enterprises by difference between actual and desired employment

Difference between actual and desired employment	Labour shortage (% of firms reporting labour shortage)	Labour surplus (% of firms reporting labour surplus)
1–5%	26.9	12.6
5–10%	33.1	37.6
10–20%	19.4	36.2
More than 20%	19.4	12.6
N of firms	263	127

Note: Due to some non-responses to the question about the scale of shortage/excess, the number of firms shown here differs from that in Table 1.

Table 3. Distribution of surveyed enterprises by staffing with various skill groups, per cent

	Staffing with this skill group is		
	Below optimal	Optimal	Above optimal
Managers	4.6	87.7	7.8
Professionals	19.3	72.6	8.1
Clerks	2.0	90.3	7.7
Skilled workers	54.2	41.5	4.3
Unskilled workers	12.5	74.5	13.0

Table 4. Distribution of surveyed enterprises by general staffing and staffing of particular skill groups, per cent

General staffing level	Managers	Professionals	Other white collars	Skilled workers	Unskilled workers
	Firms reporting optimal staffing in different skill categories				
Optimal	93.5	85.2	96.9	62.5	88.4
Under-staffed	86.0	59.6	91.9	3.0	65.2
Over-staffed	63.8	40.8	56.1	24.6	28.9
	Firms reporting under-staffing in different skill categories				
Optimal	3.1	11.9	0.7	37.3	5.2
Under-staffed	8.3	37.7	4.7	97.0	32.0
Over-staffed	3.9	15.2	2.4	42.9	6.6
	Firms reporting over-staffing in different skill categories				
Optimal	3.4	2.9	2.4	0.2	6.4
Under-staffed	5.7	2.6	3.5	0.0	2.8
Over-staffed	32.3	44.0	41.5	32.5	64.5

professionals, clerks, or unskilled workers, respectively. The shortage of skilled manual workers seems to be more acute as it was mentioned by over half of all firms in the sample.

Table 4 cross-classifies staffing levels in different skill groups according to whether firms describe themselves as being staffed optimally, under-staffed, or over-staffed overall. As might be expected, firms with less-than-optimal staffing levels are more likely than other firms to report under-staffing in all skill categories, especially skilled workers (97 per cent) and professionals (38 per cent). Interestingly, firms with optimal or more-than-optimal staffing levels also report having skill shortages in the same two skill categories (12–15 per cent and 37–43 per cent, respectively). Therefore, specific skill shortages, especially of professional and skilled workers, can coexist with overall optimal or over-staffing at the enterprise level.

Firms that reported optimal or less-than-optimal employment levels usually did not complain about labour surpluses in particular skill groups. Meanwhile, 32–65 per cent of firms with more-than-optimal employment reported surpluses in particular skill groups. Almost two-thirds of them claimed some excess of unskilled workers. Redundant workers who could potentially be reallocated towards a more efficient usage of labour can be found in all skill groups.

3.2 Causes for shortage and surplus

Firms experiencing skill shortages tend to cite a number of reasons for under-staffing, which are shown in the left column of Table 5. The four most commonly listed reasons are: lack of workers with the needed skills in the local labour market (cited by 72 per cent), paying low wages compared with other firms (41 per cent), high labour turnover (30 per cent), and high competition for workers in the local labour market (23 per cent). These reasons are consistent with an inadequate supply of workers with relevant job skills in the local labour market, high rates of labour turnover, and payment of non-competitive wages and salaries. From this list, one might conclude that the firms see the major cause of the labour shortage to be on the supply side — that the local labour market does not supply enough workers with the requisite skills, as reasons from the demand side were mentioned relatively rarely (the main reason here was the inability of firms to pay competitive wages and to retain workers already hired). However, if we

Table 5. Major reasons for labour surplus and shortage

Reasons for under-staffing	%	Reasons for over-staffing	%
High hiring costs	2.2	High firing costs	18.8
Lack of workers with needed skills in the local labour market	72.2	Resistance of trade unions to downsizing	4.7
High competition for workers in the local labour market	23.0	Prohibitions from local or regional authorities	2.3
Expectations for declining product demand	4.8	Expectations for expanding product demand	51.6
High labour turnover	30.0	Fear of conflicts with workers	10.2
Hard/harmful working conditions	18.5	'Social responsibility' of managers	47.7
Low wages compared with other enterprises	41.1		
Other reasons	8.5	Other reasons	26.6
N	270	N	128

Note: The numbers do not sum to 100 per cent because respondents could select three key reasons for under- or over-staffing.

sum up all answers related to demand constraints, this sum exceeds the sum of answers related to supply constraints. As our analysis shows, those respondents who chose demand-related explanations did not indicate a 'lack of workers on the local labour market . . .'. There is a negative and statistically significant correlation between choosing these two positions. Therefore, we believe that the conclusion about the undersupply of workforce as the major cause of the labour shortage is not supported by hard evidence. Prevalence of supply-side explanations may also have psychological reasons as surveyed managers may prefer to put the blame on outside circumstances rather than recognize their own mismanagement.

Reasons why the labour surplus remains sizable (the right column of Table 5) can be grouped as follows: (a) deliberate hoarding of labour due to expectations of output growth (position 4), and (b) involuntary hoarding due to significant turnover costs (positions 1–3, 5, 6). Firms choosing answers from group (a) tend to be growing or to be expecting output growth and are likely to be in better financial shape. In the second group, the situation was likely to be different and the firms expected downsizing. However, downsizing was too costly and therefore hardly feasible due to economic, administrative, and social reasons. In other words, high firing costs make this strategy inefficient.

If labour shortage claims were driven by under-supply of particular skills, then we could expect that under-staffed firms would face serious difficulties in searching for and hiring such workers. Surprisingly, this is not the case. Among firms that reported a shortage of managers, only 10 per cent experienced serious difficulties in finding them on the labour market (Table 6). For firms under-staffed with professionals, the similar indicator was 40 per cent; for firms under-staffed with other white-collars this was 15 per cent; for firms under-staffed with unskilled workers — 25 per cent. And even among firms that were under-staffed with skilled workers, nearly half could find workers with the needed skills relatively easy. So claims about labour shortage do not seem to be driven by an under-supply of particular skill groups.

4. Composition of shortage and surplus

How are claims of shortage and surplus distributed across firms? If not randomly, do they correlate with particular structural or performance-related characteristics of the firms? In an

Table 6. Distribution of enterprises under-staffed with various skill groups, by degrees of difficulty in searching for and hiring various skill groups, per cent of firms

	Firms with an under-staffing of				
	Managers	Professionals	Clerks	Skilled workers	Unskilled workers
No difficulties	57.1	4.2	36.8	1.5	7.8
Some difficulties arise but not often	15.4	24.3	15.8	10.3	23.3
Difficulties arise frequently but they are solved within short periods of time	18.1	33.3	31.6	31.3	43.1
Very serious difficulties	8.5	35.4	15.8	51.7	24.1
Difficulties cannot be solved within acceptable time periods	0.8	2.6	0.0	5.2	1.7
Average score (1 = no difficulties, 5 = unsolvable difficulties)	1.8	3.1	2.3	3.5	2.9

earlier paper, we argued that less efficient and less competitive enterprises were more likely to report a shortage of skilled labour (Gimpelson, 2004). However, more efficient firms that were also more competitive on the labour market faced this problem less frequently. For them, a labour shortage meant an undersupply of unique skills and specific experience, which were a product of the long-term development of the market economy and could hardly be produced in an accelerated fashion. Examples of these unique skills or specific experience are top-managers, corporate law or finance professionals, marketing or logistics specialists, etc. However, an adequate wage premium would allow such skills to be hired in other regions of the country or on the world labour market. As we are well aware, many leading Russian companies do exactly that and migrants from CIS countries, China, and Vietnam make a notable portion of functioning labour force despite transportation costs and various administrative barriers.

We start considering this issue by providing simple descriptions of firms whose managers report non-optimal employment. Table 7 shows the distribution of staffing levels for the Russia ICS sample with respect to several firm characteristics. The probability of under-staffing and the level of under-staffing are highest for firms operating in the textile industry. In this sector, over 50 per cent of all surveyed firms reported staffing levels below the optimal level, with the staffing gap averaging 23 per cent relative to desired levels. New firms established in or after 1992, small enterprises with less than 250 employees, firms operating in the metallurgy and machine-building sectors, and government-controlled firms (those with more than 25 per cent public ownership) are also more likely to report under-staffing. Over-staffing is more prevalent among large firms (with over 1,000 employees) and firms in the chemicals sector.

The fact that textile firms lead in the ranking of labour-shortage industries speaks for itself, as the textile sector is one of the most crisis-ridden in the Russian economy. Chemical and petro-chemical firms enjoy relatively good financial health. They actually faced the reverse challenge, as they inherited a large stock of employment that seemed to be excessive for their given or expected output (1.5 times larger than the sample average).

Staffing levels are also related to how firms self-rank their level of competitiveness. Firms that rate themselves as having medium to high competitiveness are more likely to have optimal staffing levels (60–61 per cent), and less likely to report either under-staffing (25–27 per cent)

Table 7. Characteristics of firms by the optimality of staffing levels

Firm characteristics	Optimal staffing	Under-staffed		Over-staffed	
	% of firms	% of firms	By what percentage	% of firms	By what percentage
All firms	59.8	27.3	17.0	12.9	14.6
Industry					
Metallurgy	56.5	29.4	19.5	14.1	13.5
Chemicals	52.4	25.0	8.9	22.6	13.7
Machinery	57.1	29.6	17.9	13.3	15.3
Wood processing	60.7	25.0	11.6	14.3	11.0
Textiles	41.9	50.5	22.6	7.5	12.3
Food	74.3	15.5	13.2	10.2	16.8
Firm size (number of employees)					
Less than 250	62.9	29.0	22.0	8.1	13.6
251–500	58.4	28.2	15.2	13.3	16.8
501–1000	61.4	22.8	8.6	15.8	15.0
More than 1000	51.1	25.2	11.7	23.8	13.2
New firm (established after 1992)					
No	60.0	26.5	16.5	13.6	14.6
Yes	59.1	30.2	18.6	10.7	14.8
Foreign ownership					
No	61.8	26.8	16.9	11.5	14.3
Yes	53.3	29.0	17.3	17.8	15.3
State stake in ownership					
Less than 25%	61.0	26.7	14.9	12.3	14.5
25% and more	56.7	28.7	21.8	14.5	14.8

or over-staffing (12–15 per cent). On the other hand, firms that classify themselves as non-competitive are less likely to have optimal staffing levels (48 per cent) and more likely to be under-staffed (35 per cent) or over-staffed (17 per cent). Whatever the reasons are that constrain under-staffed firms from employing more personnel, or constrain over-staffed firms from discharging redundant workers, non-optimal staffing levels seem to be negatively associated with firms' perceptions of their level of competitiveness.

Respondents to the Russia ICS listed non-competitive wages as a reason for their under-staffing. If this is true, non-competitive wages may account for the inability of firms experiencing labour or skill shortages either to retain their skilled workers or to hire additional skilled workers on the open labour market. Firms with below-average performance may not offer competitive wages and therefore be unable to retain their most skilled workers or to fill vacant positions with skilled labour.

Ample evidence suggests that under-staffing may emerge due to the inability of low-efficiency firms to pay competitive wages. Gimpelson (2004) used data from a survey of 300 large- and medium-sized firms in Russia to investigate whether skill shortages were driven by supply or by demand-side constraints, and if so, what the enterprises were doing to respond to the reported skill shortfalls. The analysis suggested that under-staffed firms had levels of labour productivity, profitability, and average wages that were lower than those in both optimally staffed and over-staffed firms. Furthermore, if low-efficiency firms (those with low labour productivity, profitability, or wages) declared that they had labour or skill shortages, they were more likely to use workers with mass (generic) skills supplied by the traditional

vocational education system. In contrast, more efficient firms were more likely to search for workers with specific or unique skills whose supply was limited. A similar pattern of association between reported staffing levels and firm performance emerged in the 2005 Russia ICS, which includes a much larger sample of industrial enterprises.

The association between the incidence of labour shortage and economic underperformance is analysed in Table 8. It provides estimates from a multinomial logit model where the dependent variable is equal to 1 if actual employment is lower than optimal and 2 if it is excessive. Optimally staffed firms are taken as a reference group. All estimates tell the same story: all performance-related variables are negatively and significantly associated with the incidence of reporting a labour shortage. At the same time, performance indicators are not associated with the incidence of a reported labour surplus. Over-staffing is more likely to be a function of past employment. Due to their budget constraints, less efficient firms are unable to hire as many workers as they need and to retain them, whereas very large firms are unable to downsize ('to lose extra weight') quickly regardless of their economic performance. This extra weight was inherited from the Soviet past and has not emerged from current performance. Getting rid of this 'heritage' is impeded by rigidities in current employment protection legislation.

Tables A2–A4 present the estimated results of a multinomial logit model for professionals and skilled workers, for whom the proportion of suboptimally staffed firms is especially large, and for unskilled workers.

Firms with low productivity tend to have a higher incidence of claiming shortages of skilled workers but not that of professionals. Meanwhile, profitability has no statistically meaningful effect on the likelihood of a shortage of these groups. *Ceteris paribus*, exporters need more professionals, and firms founded prior to 1992 claim that they need additional manual skilled workers. The incidence of a shortage of unskilled labour does not depend on the structural characteristics of firms, but it is negatively related to profitability and productivity. The effect of the average wage is statistically insignificant in this case.

We now consider the factors affecting the incidence of a labour surplus. For professionals, two factors are significant in all specifications: the age and size of the firms. Old (established

Table 8. Determinants of staffing: all employees, multinomial logit

	Specification 1		Specification 2		Specification 3	
	Under-staffing	Over-staffing	Under-staffing	Over-staffing	Under-staffing	Over-staffing
Exporter	-0.303	0.161	-0.225	0.186	-0.241	0.168
New firm (established after 1992)	0.097	-0.189	0.098	-0.151	0.077	-0.188
Foreign owned	0.076	0.841**	0.033	0.592*	0.136	0.742**
Government control (>25%)	0.253	-0.077	0.146	0.051	0.076	-0.157
Employment (log)	-0.022	0.460***	0.043	0.480***	0.038	0.504
Wages (log)	-0.273**	-0.118				
Value-added per worker (log)			-0.281***	-0.226*		
Profitability					-1.080**	-1.028***
Constant	-0.336	-26.983	0.348	-26.142	-1.023	-27.476
Pseudo- R^2		0.1437		0.1344		0.1392
N		894		929		946

Note: The reference group is enterprises with optimal staffing. Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

prior to 1992) and larger firms have a higher probability of needing to downsize professionals. Firms that claim to have a surplus of skilled manual workers do not differ much from those with optimal employment. However, this could be due to the fact that the first group makes up a very small portion of the sample (4.2 per cent). Large firms and firms with foreign ownership are more likely to have an excess of unskilled workers. Although it seems strange, the latter can be due to the fact that the presence of a foreign investor strengthens efficiency, enhancing pressure on management; this pressure may result in a more intense restructuring accompanied by a downsizing of unskilled labour.

In conclusion, all the available evidence tells the same story. A surplus or shortage of labour, as reported by the firms, reflects their inability to offer competitive wages in order to attract and retain workers of the required quantity and skills. If this conclusion is correct, then the main problem is seen not in the numerical deficit of workers, including skilled workers, but in the inefficiency of the general market selection mechanism. This inefficiency allows unviable Russian industrial firms to stay afloat and loudly call for more workers.

5. How could the shortage be remedied?

Firms that report a shortage of labour can search for a remedy in several complementary ways, which include searching for additional workers in the external market, increasing the number of working hours for existing personnel, investing in productivity-enhancing on-the-job training of workers, or raising wages to make vacant jobs more attractive. An increase in wages as discussed above does not get empirical support as a popular remedy. The use of other methods is discussed below.

The first and most obvious way for overcoming the shortage is to intensify recruitment activities. It is reasonable to expect that firms experiencing a labour shortage should lead in job creation and lag in job destruction. However, the actual picture appears to be the opposite (Table 9). Using firm-level ICS data and following conventional methodology for measuring job flows (see, for example, Brown and Earle, 2003), we estimated job creation and job destruction rates for all firms in our sample. In 2004, under-staffed firms gained 3 per cent of new jobs and lost 6 per cent of old ones. They created new jobs almost at the same rate as optimally staffed firms did, and they lost jobs at the same rate as over-staffed ones. Their main problem here was in inability to retain current jobs and workers. They also faced difficulties in hiring new employees.

An alternative strategy to remedy a labour shortage is to extend working hours and better use working time. However, under-staffed firms had the largest losses of working time. Their

Table 9. Job creation and job destruction by firms with different levels of staffing

Staffing level	% of firms creating jobs	% of firms destroying jobs	Job creation rate, %	Job destruction rate, %
Optimal	54.6	45.4	3.2	4.7
Under-staffed	49.6	50.4	3.1	6.1
Over-staffed	39.7	60.3	1.8	6.5
Total	51.3	48.7	2.9	5.3

Note: In estimating job creation and job destruction rates, we excluded 1 per cent of firms with maximum job losses and 1 per cent of firms with maximum job gains.

losses made up 16 per cent of their annual amount of working hours, against 12–13 per cent reported by optimally staffed or over-staffed firms. Additional vacations, absences, and sick leaves were among the main reasons for the underuse of working time. This raises the question of whether the labour shortage claimed by these firms emerges as a consequence of their own inability to efficiently use their existing workforce. In any case, under-staffed firms behave in a far different way from one would expect. Instead of making working hours longer, these firms tend to have their employees to work even shorter hours.

One possible solution to skill shortages in the local labour market is to train or upgrade the skills of the existing workforce. Investments in in-service training are an important precondition of competitiveness as they build special skills and knowledge that are complementary to technology. Correspondingly, one could expect that firms with a labour shortage tend to invest more in in-service training. The hiring versus retraining option in the Russian labour market is discussed by Denisova *et al.* (2006), based upon a survey of 1,000 industrial enterprises in 2004. In their survey, 56 per cent of firms noted that retraining existing workers is the most efficient way to meet skill shortages, 35 per cent stated that hiring from the external market is preferable, and 25 per cent preferred cooperation with education and training institutions to provide trained personnel. Is this strategy used by firms claiming shortages?

Simple tabulations suggest that about 70 per cent of manufacturing enterprises in the sample provide employees with in-service training. If compared with training incidence in other BRIC (Brazil, Russia, India, China) countries, Russia trails behind China and Brazil, though is far ahead of India.

However, these simple estimates of training incidence are misleading because Russian firms that report training actually provide training to very few of their employees. Depending on the firm providing training, the survey suggests that managers, professionals, and skilled workers are the three skill groups most likely to benefit from in-service training. On average, only 9–10 per cent of managers and professionals and about 7–8 per cent of skilled workers receive formal training. These figures seem to be extremely low by international standards, and suggest that in-service training practices are not firmly entrenched among Russian firms.⁴ Thus, although many more Russian firms train, they provide training to a relatively small per cent of their workforce as compared with other countries. Another important finding is that on average, formal in-service training provided by the Russian enterprises is rather short — no more than 2–3 weeks.

Are firms that report under-staffing more likely to train workers in order to meet skill shortfalls? We might expect the answer to be positive, yet surprisingly it is not. As Table 10 shows, 67–69 per cent of firms with a labour shortage train their workers, and this does not differ from training in optimally staffed firms. In fact, firms that identified themselves as being over-staffed were more likely than other firms (those with optimal staffing or under-staffing) to provide in-service training. Among them, 84 per cent reported that they trained their personnel. These firms were also more active in in-house training of particular occupational groups. One explanation (consistent with Table 4) is that skill shortages in specific skill groups can coexist with overall optimal or over-staffing, so even over-staffed firms provide training. Another explanation is that this group consists of large firms, many of which have their own in-house training institutions and programmes. Large firms can also benefit from economies of scale, as training costs per worker will be lower than for smaller enterprises. Compared with the two other groups of firms, those with a labour shortage did more training for unskilled workers and less for managers and skilled workers.

However, the duration of training was the longest at under-staffed firms and was 4 weeks on average, compared with 2–3 weeks at other firms. This could be due to the fact that these firms

Table 10. In-service training by staffing levels

	% of enterprises providing any in-firm training	% of employees trained (conditional on provision of in-firm training)	Average duration of in-firm training, weeks (conditional on provision of in-firm training)
<i>Firms with optimal staffing</i>			
All employees	67.2	—	—
Managers	40.5	8.8	2.7
Professionals	41.0	9.0	3.2
Clerks	14.9	1.0	2.2
Skilled workers	34.8	8.0	3.6
Unskilled workers	12.8	1.2	2.9
<i>Under-staffed firms</i>			
All employees	68.9	—	—
Managers	41.1	7.5	3.1
Professionals	47.0	9.4	3.3
Clerks	11.9	1.3	1.8
Skilled workers	34.1	5.7	3.7
Unskilled workers	13.7	1.8	4.1
<i>Over-staffed firms</i>			
All employees	84.1	—	—
Managers	54.7	11.0	2.7
Professionals	62.5	13.5	2.2
Clerks	18.8	1.1	1.5
Skilled workers	39.8	7.8	2.8
Unskilled workers	16.4	1.1	2.1

were only able to attract a lower-quality labour force that needed longer training even for basic tasks.

At all firms, regardless of their staffing (surplus/optimal/shortage), there were inconsistencies between demand for skills and in-firm training. As Table 10 suggests, managers and professionals were trained most frequently, although the shortage of these workers was not the most acute. However, the priority of these groups is easily explained, as investments in their specific human capital can bring higher returns than investments in blue-collar workers or clerks. It is interesting to note that although complaints of under-staffed firms on a shortage of skilled manual workers are almost universal (97 per cent), only one-third of these firms invested in the in-firm training of skilled workers.

So why do Russian firms not train in-house to meet skill shortfalls if they tend to report a limited supply of skills on the labour market? The importance of various training correlates can be investigated within a regression framework using a probit model. The model estimates the probability of in-service training by regressing the ‘any formal training’ dummy variable on a set of explanatory variables, including measures of firm size, the share of workers with higher education, and other firm attributes such as export orientation, R&D spending, and foreign or government ownership. A corresponding set of regressions was estimated separately for the probability of in-house training and external training.

The regression results reported in Table 11 confirm the importance of several factors that shape the demand for providing training. First, the likelihood of in-service training is higher in larger firms (those with over 250 employees) and increases further with size. Larger firms

Table 11. Determinants of in-service training: probit models, marginal effects

	Any training	In-house training	External training
% of workers with higher education	0.002	0.000	0.002*
Positive R&D spending	0.052	0.066*	0.047
New firm (established after 1992)	-0.021	0.004	-0.058
Exporter	0.067*	0.079**	0.078**
Some foreign ownership	-0.072	-0.033	-0.092*
Government control (>25%)	0.056	0.002	0.116**
Firm size dummies (less than 250)			
251–500	0.113***	0.089**	0.124***
501–1000	0.168***	0.174***	0.216***
More than 1000	0.215***	0.314***	0.269***
Staffing level (optimal)			
Under-staffed	0.053	0.073*	0.031
Over-staffed	0.133***	0.138**	0.124**
Pseudo- R^2	0.1464	0.1390	0.1396
N	964	969	963

Note: Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

facing surplus and being constrained by job protection rules resort to a training option. Second, a shortage claim does not affect training incidence although we could expect just the opposite. Third, export-oriented firms and, to a lesser extent, firms that engage in R&D are also more likely to train. Employers that export have a greater incentive to train their workers to produce high-quality products meeting the exacting standards of foreign buyers, and to increase labour productivity to meet competitive pressures (Tan and Batra, 1995).

The third and fourth columns of Table 11 highlight differences in the determinants of in-house and external training. Training from external sources tends to be more common among firms where the government has controlling interests, and in export-oriented firms with a high share of highly educated workers. This reliance on external training appears to be a carry-over from the pre-transition period, when many state-owned enterprises had arrangements to hire specifically trained graduates from related vocational and technical training institutions. In contrast, in-house training is shaped less by the share of highly educated workers, and more by the firm's export orientation and R&D spending.

As far as shortage/surplus variables are concerned, a labour shortage seems to stimulate in-house training but has little impact on the provision of more expensive external training. In addition, any external training provides general skills and knowledge, which are portable and can be used outside the firm. Expectations that trained workers may behave opportunistically may de-stimulate investments in external training. *Ceteris paribus*, over-staffed firms provided some training 12–14 per cent more frequently than firms that were optimally staffed. This confirms the conclusion made earlier that a general surplus does not exclude a shortage of specific skills and experience. There are different sources of demand for training, not just for making up numerical labour shortfalls, but also for meeting the specific skill needs for exporting and new technology, as suggested by Table 12.

Table 12 analyses how firms use training to overcome labour shortages of particular occupational groups. Larger firms train more in all occupational groups and benefit from

Table 12. Determinants of in-service training for skill groups: probit models, marginal effects

	Managers	Professionals	Clerks	Skilled workers	Unskilled workers
Positive R&D spending	0.088**	0.065*	0.054*	-0.010	0.010
New firm (established after 1992)	-0.010	-0.023	0.011	-0.014	-0.019
Exporter	0.045	0.041	-0.014	0.032	0.007
Some foreign ownership	0.020	0.005	-0.005	-0.030	0.007
Government control (>25%)	0.044	-0.036	0.032	0.008	0.046
Firm size dummies (less than 250 employees)					
251–500	0.099**	0.127***	0.030	0.080*	0.083***
501–1000	0.247***	0.195***	-0.022	0.139***	0.024
More than 1000	0.224***	0.205***	0.085**	0.196***	0.118***
Staffing level (optimal)					
Under-staffed	-0.050	-0.007	—	-0.016	-0.001
Over-staffed	0.045	0.200***	0.045	0.076	0.000
Degrees of difficulty searching for and hiring different skill groups (no difficulties)					
Some difficulties, or difficulties are solved within short periods of time	0.037	-0.002	0.093***	0.097*	0.009
Very serious or unsolvable difficulties	0.128**	0.122**	-0.024	0.109*	0.052
Pseudo- R^2	0.1056	0.1012	0.0938	0.1046	0.0979
N	982	980	873	982	827

Note: Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

economies of scale. Innovative firms are more likely to train, albeit white-collar workers only. However, there are no visible effects of staffing level variables on the training activities of particular occupational groups. The only relevant finding is that training of professionals is more common at over-staffed firms. Another interesting tendency is that high search and hiring costs emerge here as a main stimulus to provide training. This effect is statistically significant for all occupational groups except unskilled workers. However, in any case it can be argued that under-staffed firms are not more likely to invest in firm-specific skills than optimally staffed or over-staffed firms. This questions the hypothesis that employers' claims of a shortage of labour or particular skills provide reliable signals.

Firms that claim to experience a labour shortage seem to do little of what might be expected given a physical lack of the requisite workforce. They do little to minimize the losses of working time or to have employees work more hours, they invest less in training, and they are rather passive in hiring. This bundle of behavioural responses complements the image of these firms as market losers (non-competitive in the labour market).

6. Conclusions

The survey evidence discussed in this paper was collected when the Russian economy was experiencing an economic boom and rapid growth. It shows how post-socialist manufacturing enterprises (state-owned or privatized) responded to a shift in demand associated with

economic growth. When facing labour market constraints, what they call labour excess or shortage, they send signals that affect government agencies, other firms, and educational institutions. If these signals are wrong or incorrectly attributed, they are likely to disorient economic policy. The economic bust of 2008–9, which replaced the boom of 2000–7, forces us to be more careful in interpreting the evidence that may seem obvious and self-evident at first.

During the 1990s, many observers of the Russian labour market highlighted the issue of widespread under-employment, hidden unemployment, and underuse of labour. The economic growth and recovery in the 2000s brought the opposite conviction that a shortage of labour and skills had emerged as a crucial constraint for growth. This conviction strengthened over time and by 2005–6 had become a consensus among labour market analysts. For many Russian politicians, bureaucrats, industrialists, and education specialists, this thesis provided a valid argument to call for stronger governmental intervention in the labour market and education. According to an extreme version of this view, the state should step in and participate more actively in deciding whom, how, and what skills the educational system should teach. This conclusion fits many vested interests as bureaucrats always want to acquire more redistributive power and employers seek ways to shift some training costs onto the state budget. These ideas, which concern the interests of millions of citizens in the country, assume that significant budgetary funds may come up for grabs. Hopes of various social groups for being allowed to share the pie shape the social consensus on relevant policies. This concentration of vested interests is not unique to Russia and was mentioned by Freeman in relation to the USA (Freeman, 2006). As the outcomes of such policies take years to be seen, their lobbyists do not expect any personal responsibility for plausible faulty advice. That is why the thesis on labour shortage deserves to be carefully scrutinized and cannot be taken for granted.

In the 2000s, as labour shortage claims were loudly heard in many transition countries, it would seem logical to consider all these cases together (Rutkowski, 2007). However, this would be erroneous. If in the Central and Eastern European (CEE) countries that joined the EU the labour shortage could emerge as a consequence of the accession and subsequent out-migration to more developed EU states (Zaiceva and Zimmerman, 2008), the Russian situation was somewhat different. Unlike the new EU countries, Russia enjoyed a certain increase in the efficient labour supply, but not a decrease. However, if separate EU countries are considered ‘mega-firms’, we can see some parallels with our story: labour shortage claims often come from the least efficient and competitive agents that are unable to offer competitive remuneration. State borders can hide the fact that complaints come from low-efficiency areas.

At the time of writing, the Russian economy (as well as all other major economies) was in a deep economic recession. The major reaction of the Russian labour market to the economic downturn was again an accumulation of additional excess labour. In any case, all institutional constraints and incentives that induced firms in the 1990s to underuse their workforce are still in place. Our new survey of manufacturing firms conducted in 2009 shows that excess labour claims dominate over shortage claims but both can easily coexist.

What does our empirical study show? First of all, it reveals a sharp mismatch between the states of the labour market that have been painted by using ‘objective’ indicators and by managers’ self-reported perceptions. Managers are extremely concerned with shortages of labour in general as well as by shortages of particular skills. However, the behavioural responses of their firms to tentative shortages do not provide any proof of this claim.

Managers that name shortages to be an investment constraint usually do not link it to the particular wage levels at their own firms, but rather explicitly recognize low wages as a factor contributing to the shortage. Interesting nuances come with a more detailed analysis. Of those managers who complain of a shortage, only two-thirds explain the shortage by a lack of needed skills in the market. Half of those who nevertheless claim a lack of needed workers in the labour market actually face no difficulties themselves in searching for and hiring new workers with the required characteristics. If these caveats are accounted for, the scale of expected labour shortage gradually shrinks and no longer seems threatening.⁵

A labour shortage is understandable if it emerges as a problem of rapidly expanding firms. If a firm grows too fast, it may face difficulties in searching for and hiring new workers with the needed skills, as this requires significant time and entails costs and thereby becomes an obvious constraint for further growth. Basically, the firm wants more than a tight labour market can offer. However, most Russian firms with a labour shortage tell us a completely different story, as they are more likely to downsize than expand. In general, they suffer from lower productivity, make less profit, employ a low-paid workforce, and gradually lose their jobs. This general conclusion emerges from the complex study of various associations between performance and an excess or shortage of labour.

Even more paradoxical is the fact that firms reporting a labour or skills shortage seem to expend little effort on solving the problem. In fact, they do little to attract new workers and to use working hours more efficiently; they under-invest in training and keep using a low-wage policy instead of trying to attract better workers through offers of higher wages and better training. The contrast between how much firms complain of a shortage of skills and how little they in fact do in order to fill the gap looms large and deserves a special study (Tan *et al.*, 2007). Taken together, various pieces of the story hint at the fact that wage levels that can be significantly lower than outside options available to workers largely drive the labour shortages in these firms.

How can we explain the sharp contrast between widespread beliefs and our survey-based conclusions? In a competitive market environment, inefficient firms rapidly lose in the competition for better workers to more efficient firms; they tend to quit the market and their voice is not heard anymore. If firms are vocal in their shortage claims, they are likely to be expanding quickly. The current Russian story is completely different. Market selection works poorly, thus allowing inefficient firms ('unburied but dead', as coined by Russian economist B. Kuznetsov) that have been losing labour to remain afloat for long time. It is these firms that become the major disseminators of complaints of labour shortages. As their population remains significant and they are often important regional employers, their voice remains undeservedly loud and pressures the government for state-funded vocational training and other forms of assistance. Like a fog, this informational noise hides the real problems that more efficient firms may face.

Summing up this part of the story, it can be said that non-competitive, inefficient, and low-wage firms are the most vocal in shortage claims. Their fragile market position explains why they are unable to raise their wages and why they keep losing jobs, whereas they benefit from the inefficiency of bankruptcy regulations that allow them to stay afloat. From a welfare point of view, it would be less efficient if they could hire as many additional workers as they want. In this respect, the problem of shortage emerges as a symptom of a severe institutional inefficiency.

Mass complaints of a shortage are only a part of the total picture. Our study shows that shortage claims in the Russian manufacturing coexist with excess claims reported by a large segment of firms. Excess labour is also troublesome, but is more likely to be an attribute of

very large firms privatized in the 1990s. For these firms, personnel reduction is vitally important for retaining market competitiveness. Their downsizing is institutionally constrained by current employment regulations and administrative interventions that seem to overprotect workers that are in excess in relation to expected output.

The main conclusion that emerges from this study is that difficulties for firms in maintaining the optimal employment mix are grounded in the institutional environment, which does not allow for a quick reallocation of labour from pockets of inefficiency to pockets with more efficiency. If this conclusion is correct, then any attempts to substitute a complex restructuring of market institutions with detailed governmental intervention into vocational training will bring even more inefficiency and a further deterioration of the competitiveness of Russian manufacturing firms.

We strongly believe that the major reason for widespread and loud claims of shortages in the modern Russian economy is not a physical shortage of labour, but rather weak selection mechanisms. Thus the key issue is not a shortage or excess of labour in the Russian market but an excess of non-viable firms and a shortage of highly efficient firms. This excess/shortage distorts the labour market. The major solution is seen in creating institutional conditions that stimulate a more efficient reallocation of labour.

Appendix

Table A1. General characteristics of the Russia ICS sample

	Average	Median	% of surveyed enterprises
Industry	—	—	8.5
Metallurgy	—	—	8.8
Chemicals	—	—	40.1
Machinery	—	—	8.6
Wood processing	—	—	9.3
Textiles	—	—	24.8
Food	—	—	43.8
Firm size	—	—	25.7
Less than 250	—	—	15.9
251–500	—	—	14.7
501–1000	—	—	23.1
More than 1000	—	—	28.3
Foreign shareholder present	—	—	21.7
State's stake in ownership more than 25%	—	—	51.9
New firm (after 1992)	—	—	45.3
Exporter	—	—	54.3
Capacity use, %	64.1	70.0	—
Rate of investment in fixed capital, %	33.2	9.1	—
Profitability, %	9.8	9.4	—
Value-added per worker, thnd rubles	201.4	137.9	—
Average monthly wage, rubles	6,139	5,248	—
Employment growth in 2004, %	-1.5	0	—
N		1,002	

Table A2. Determinants of staffing: professionals, multinomial logit

	Specification 1		Specification 2		Specification 3	
	Under-staffing	Over-staffing	Under-Staffing	Over-staffing	Under-staffing	Over-staffing
Exporter	0.369*	0.285	0.491**	0.350	0.396*	0.407
New firm (established after 1992)	0.145	-0.918**	-0.089	-0.780*	-0.067	-0.958**
Foreign owned	-0.216	0.568	-0.044	0.560	-0.088	0.601
Government control (>25%)	0.161	-0.115	0.168	0.013	0.157	-0.287
Employment (log)	-0.012	0.637***	0.001	0.619***	-0.016	0.621***
Wages (log)	-0.213*	-0.042				
Value-added per worker (log)			-0.012	-0.213		
Profitability					0.248	-2.135**
Constant	-1.622*	-30.27***	-2.071**	-29.21***	-2.091**	-31.20***
Pseudo- R^2		0.1347		0.123		0.1291
N		890		925		940

Note: The reference group is enterprises with optimal staffing. Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

Table A3. Determinants of staffing: skilled blue-collar workers, multinomial logit

	Specification 1		Specification 2		Specification 3	
	Under-staffing	Over-staffing	Under-staffing	Over-staffing	Under-staffing	Over-staffing
Exporter	-0.022	0.013	0.054	0.155	0.024	0.380
New firm (established after 1992)	-0.285	0.251	-0.336*	0.269	-0.387**	-0.004
Foreign owned	0.060	0.484	0.039	0.077	-0.026	0.428
Government control (>25%)	-0.051	-0.050	-0.037	0.081	-0.050	-0.225
Employment (log)	0.181*	0.359	0.167*	0.306	0.138	0.337
Wages (log)	-0.323***	-0.319				
Value-added per worker (log)			-0.303***	-0.314		
Profitability					-0.419	-0.462
Constant	-1.37*	-26.06	-0.190	-24.63	-1.65**	-43.04
Pseudo- R^2		0.1455		0.1378		0.1352
N		890		924		941

Note: The reference group is enterprises with optimal staffing. Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

Table A4. Determinants of staffing: unskilled workers, multinomial logit

	Specification 1		Specification 2		Specification 3	
	Under-staffing	Over-staffing	Under-staffing	Over-staffing	Under-staffing	Over-staffing
Exporter	0.265	-0.012	0.251	0.068	0.343	0.107
New firm (established after 1992)	-0.025	-0.305	-0.192	-0.269	-0.015	-0.378
Foreign owned	0.457	1.063***	0.385	0.998***	0.303	0.951***
Government control (>25%)	0.043	-0.334	0.023	-0.371	0.002	-0.394
Employment (log)	0.130	0.479***	0.151	0.425***	0.165	0.426***
Wages (log)	-0.082	-0.118				
Value-added per worker (log)			-0.204*	0.027		
Profitability					-1.432**	-0.283
Constant	-3.57***	-28.85***	-2.57**	-29.23***	-3.70***	-29.18***
Pseudo-R ²		0.1425		0.1347		0.1358
N		847		879		898

Note: The reference group is enterprises with optimal staffing. Industry and regional dummies are included in the analysis.

* Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent.

Notes

¹ According to Sabirianova (2002), over 40 per cent of all workers in Russia changed their occupations in 1991–98, of which two-thirds did this in 1991–95. She termed this mass occupational change the ‘Great Human Capital Reallocation’.

² On wage flexibility in the Russian labour market, see Layard and Richter (1995), World Bank (2003).

³ For more details about the survey and its sample design, see World Bank (2006).

⁴ In Malaysia, a rapidly growing East Asian country, which is also ranked as having high skill shortages, 24 per cent of managers, 32 per cent of professionals and technicians, and 13–16 per cent of production workers received formal in-service training (World Bank, 1997).

⁵ Mitchell, while discussing the labour shortage claims in the USA widely reported in the 1980s, also notes that a more accurate and detailed look at survey data dismisses these claims as groundless (Mitchell, 1989).

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