

JOB CREATION AND JOB DESTRUCTION IN POLAND (1993-1999)¹

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abstract

The paper focuses on job creation and job destruction – and thus on job reallocation – during the transition in Poland. In a broad sense, job reallocation (turnover) is an indicator of labor market flexibility and dynamics. It tends to be low in labor markets that are rigid and stagnant, and it is high in labor markets that are flexible and vibrant. In a more narrow sense, job turnover is an indicator of economic restructuring, it measures the intensity of reallocation of labor away from low productivity toward high productivity jobs.

Our analysis indicates that the labor market in Poland is relatively flexible and dynamic in the sense that existing regulatory constraints have not prevented far reaching job reallocation. The rate of job turnover observed in Poland in the late 1990s is comparable to that in OECD countries with flexible labor markets. However, the rate of job destruction has exceeded the rate of job creation, which means that efficiency of the labor market needs to be improved in order to encourage employment growth and reduce unemployment. The rate of job turnover has varied during the transition in Poland, exhibiting a distinct U-shaped pattern. This pattern of job reallocation overlapped with the pattern of unemployment, suggesting a close link between those two variables. Intensified job reallocation leads to productivity improvements, but also creates spatial and skill mismatches, which cause unemployment.

¹ A background paper prepared for the Poland's Labor Market Study of the World Bank

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Job reallocation takes place both within and between sectors and regions. Given that central planning led to misallocation of resources, including labor, one would have expected that once the economy is liberalized, the between effect, redressing the inherited misallocation problem, is predominant. This might have indeed be the case at the early stage of the transition, however since the late 1990s job reallocation in Poland has largely taken place *within* industries and regions. This is a pattern prevailing in mature market economies.

As expected, job reallocation is substantially higher in the private than in the public sector. Interestingly, the rate of job destruction is virtually the same in both sectors, it is the rate of job creation that is much higher in the private sector than in the public sector. Job turnover is also much higher in small than in large firms. Again, small and large firms differ in terms of the job creation rate, not in terms of the job destruction rate. The larger the firm size, the lower the job creation rate, although in small firms a high job creation rate does not necessarily imply large absolute employment gains. Still, net employment growth is heavily concentrated in small firms. In particular, newly established firms account for large part of job creation and net employment growth.

Policy implications of the analysis are straightforward. Job destruction is a necessary components of economic restructuring and thus an unavoidable part of economic growth. Policies to foster employment growth and prevent unemployment should therefore focus on encouraging job creation rather than on forestalling job destruction and protecting non-viable, low productivity jobs. The means to foster job creation is to promote competitive product markets, remove barriers to the entry of new firms, to create a favorable investment climate and an enabling business environment.

INTRODUCTION

It has been often claimed that the Polish labor market is stagnant, labor mobility is low and restructuring is limited (Bell, 2000). However, these claims are hard to reconcile with the fast economic growth that Poland has been enjoying for a number of consecutive years. This paper looks at this puzzle.

It focuses on job creation and job destruction during the transition in Poland. This paper is the first one to carry out the analysis of job reallocation using a unique micro data set containing information on employment, hirings, and separations. The advantage of this data set is that it covers all registered firms. In contrast, earlier research on job reallocation was based on a data set covering only large enterprises, which was bound to bias the results (Faggio and Konings, 1999). Other researchers have approached the issues of mobility and restructuring from a different angle, using a household based Labor Force Survey, which limited the analysis to industry (as opposed to firm) level changes (Bell, 2000; Kwiatkowski et al., 2000). Using the comprehensive employer based survey we were able to approach the issue of job creation and job destruction directly and to obtain more precise estimates.

The paper has three specific objectives: (a) to compare job turnover in Poland with that in selected OECD countries, (b) to examine changes in job turnover during the course of the transition, and (c) to analyze variation in job turnover according to employer characteristics such as industry, region, ownership and firm size.

We found that, in contrast to the results of earlier research, the rates of job creation and job destruction have been relatively high in Poland, especially at the initial stage of the transition in the early 1990s, and again, after some temporary decline, in the late 1990s. This indicates that the labor market in Poland has been more dynamic and restructuring more advanced than so far has been assumed. The increased pace of industrial restructuring observed in the late 1990s is likely to be one cause of the concurrent marked rise in unemployment.

The paper is structured as follows. Section I describes the data set. Section II compares job turnover in Poland during to that in selected OECD countries. Section III analyzes changes in job turnover during the course of transition. Section IV analyses job

turnover by employer characteristics: industry, region, firm ownership and size. Section V discusses the policy implications and concludes.

I. DATA SET AND DEFINITIONS

Source of data and definitions. The study was based on the labor turnover section the survey of the general population of firms registered under the REGON system (Z-01). The survey is carried annually by the Central Statistics Office (CSO). The labor turnover section contains information on current and previous year employment, as well as on hirings and separations.

Employment is defined as the number full-time wage and salary workers on permanent contracts (i.e. seasonal and temporary workers are excluded), as of September 30. This relatively narrow definition of employment is likely to cause that the actual rate of job turnover is underestimated as the creation and destruction of temporary and part-time jobs is not accounted for.

Using data on current and previous year employment new analytical variables were constructed according to the following definitions:³

Gross job creation rate is measured as the sum of all employment gains in expanding firms in a given year, divided by total employment at the beginning of the year.

Gross job destruction rate is defined as the sum of all employment losses in contracting firms in a given year divided by total employment.

The sum of gross job creation and gross job destruction gives a measure of *gross job reallocation (turnover)*, and the difference yields the *net employment growth rate*.

Since the measure of job reallocation reflects, to a large extent, the dynamics of aggregate employment, we report also information on *excess job reallocation*, which is defined as job reallocation rate minus the absolute value of net employment growth.

Survey coverage. The survey covers all firms, excluding firms of physical (non-legal) persons employing less than 6 workers. In practice, data set contains over 20 percent

³ Formulas are presented in Annex 1.

of firms with reported employment level of 5 or less workers. These firms are either (a) legal persons employing less than 6 workers, or (b) firms with total employment larger than five, but only five or less workers meet the definition of employment used to calculate labor turnover (see above).

Given that the survey covers operating firms, closing firms are bound to be substantially underrepresented in the data set, which leads to the negative bias in the job destruction data.⁴

Sample. Given that the survey is a census of all registered firms, the size of the original data set is very large (e.g. 292,085 firms in 1999). For practical purposes a much smaller data set can be used without a significant loss of precision of estimates. Thus, we constructed a working data set (for each year) by drawing a 20% random sample of firms, maintaining the proportion of firms in each region (voivodship).

Data cleaning. There are three basic problems with the data set: (a) no distinction between zeros and missing values, (b) inconsistency (in some cases) between data on current employment, last year employment, hirings and separations, (c) presence in the data set of CSO estimated observations in addition to actual data. We developed special procedures to handle problems (a) and (b).⁵ As to the problem (c), it reflects CSO's attempt to increase the representation of small firms in the data set.⁶ Estimated observations account for 41 percent of all observations. However, for one-third of the estimated observations the previous year employment was set to zero, which makes these observations useless for the analysis of employment changes, and their inclusion would bias the results (overrepresentation of "openings"). Thus we decided to drop these estimated observations from the sample for 1999 (the only year for which we had information on whether the observation is actual or estimated). However, to check the robustness of results and for consistency with data for earlier years we carried out calculations also on a data set that included the estimated observations. It turned out that

⁴ We categorized a firm as a closure if the current year employment is reported as zero and the previous year employment was reported as greater than zero.

⁵ The procedures are available upon request from the author (crjt99.log).

⁶ Average employment in the "estimated" firms is 4 persons.

the aggregate data on job turnover are robust, and the inclusion/exclusion of the estimated observations does not significantly affect the results.

The application of data cleaning procedures turned the *original* data set into the *working* (cleaned) data set. The description and comparison of both data sets is given in Annex 2.

II. JOB TURNOVER IN POLAND AGAINST SELECTED OECD COUNTRIES

The received wisdom is that the Polish labor market is rather stagnant and characterized by relatively low mobility (Faggio and Konings 1999, Bell 2000, Kwiatkowski et al. 2000). In particular, Faggio and Konings claim that in Poland the job reallocation rate (job turnover), is similar to that in *regulated* labor markets in Western Europe (such as Germany) and substantially lower than in *flexible* labor markets (such as the UK or the US). They attribute the apparently low job reallocation rate in Poland to employment protection legislation and the presence of strong trade unions.

Our results indicate that job turnover in Poland is substantially higher than that reported by Faggio and Konings (1999), and that it is relatively high by the OECD standards (Table 1). For example, we find that the job turnover rate in Poland in 1996 was 14 percent (Table 2), considerably higher than the 8 percent reported by Faggio and Konings.

Table 1: Job gains and job losses
Average annual rates as percent of total employment

	Poland ^{a)}	France	Germany	Italy	United Kingdom	United States
	1993-99 ^{b)}	1984-91	1983-90	1987-92	1985-91	1984-91
Gross job gains	8.4	12.7	9.0	11.0	8.7	13.0
Openings	3.4	6.1	2.5	3.8	2.7	8.4
Expansions	5.0	6.6	6.5	7.3	6.0	4.6
Gross job losses	9.1	11.8	7.5	10.0	6.6	10.4
Closures	0.8	5.5	1.9	3.8	3.9	7.3
Contractions	8.3	6.3	5.6	6.2	2.7	3.1
Net employment change	-0.7	0.9	1.5	1.0	2.1	2.6
Job turnover	17.5	22.4	16.5	21.0	15.3	23.4
Continuing establishments only	13.3	12.9	12.1	13.5	8.7	7.7

a) Data refer to firms rather than establishments.

b) Average from the three years: 1993, 1996, 1999.

Note: Data for continuing establishments are more accurate and comparable with those for other countries.

Source: OECD Employment Outlook 1996 and author's calculations.

In the 1990s the average job turnover rate in Poland was in the middle of the OECD range. In fact, if one focuses on continuing establishments, the job turnover rate in Poland was one of the highest among the OECD countries.⁷ As Table 1 documents, the average job turnover rate in continuing firms in Poland was about 13 percent in the 1990s, compared for example with less than 10 percent for the UK and the US (in the late 1980s). Obviously, restricting the sample to continuing firms distorts the picture, as for example in the US most job turnover springs from job openings and closures; still, the point remains valid that job flows in Poland are comparable in magnitude to those observed in the developed market economies.

In one important respect, however, Poland is different from the developed market economies. Namely, in Poland a much larger part of job turnover is accounted for by job destruction than by job creation. Specifically, in Poland job losses account for over 60 percent of the job turnover, while in all other OECD countries under consideration they account for less than 50 percent.⁸ In other words, while in Poland job turnover results largely from job destruction, in other countries it predominantly results from job creation. This is a significant difference, which implies that welfare costs of the given rate of job reallocation are in Poland higher than in developed market economies.

Put differently, the transition in Poland is characterized by relatively high job destruction and low job creation. Poland is at the bottom end of the OECD range in terms of job creation but in the middle of the range in terms of job destruction. For example, the average annual gross job gains accounted for over 8 percent of total employment in Poland, less than in all OECD countries in the sample. At the same time, the average annual gross job losses accounted for 9 percent, more than in Germany or the UK, but less than in

⁷ In the case of Poland, data on job turnover in *continuing* firms are more accurate and comparable with other countries than those on job turnover in *all* firms. The reason is that firm closures and associated job losses are significantly under-represented in the Polish data set (which is based on the survey of operating firms) and accordingly job turnover is underestimated.

⁸ For the sake of comparability the data refer to continuing firms only.

France, Italy, or the US. In 1999, when Poland witnessed an significant increase in both job creation and job destruction, the former reached a moderate level by the OECD standards (10 percent), while the latter reached a relatively high level (11 percent).

This negative aspect of job flows in Poland notwithstanding, the results portray a dynamic labor market, characterized by relatively intense job reallocation. The high rate of job destruction indicates that the firing costs are not a binding constraint on restructuring. This undermines the commonly held view that the labor market in Poland is stagnant and restructuring is limited. What explains this discrepancy? First, there are different dimensions of labor market mobility. A labor market can be dynamic in one dimension and at the same time stagnant in another. For example, while the job reallocation rate is high in Poland, there is a stagnant pool of unemployment with associated low transition rates from unemployment to jobs. Second, even if one looks at the same aspect of labor market dynamics, results may vary depending on the data used. This point – a difference in data sources – appears to account for the discrepancy between results obtained by Faggio and Konings and those presented in this paper. We used a much superior data set, and thus our results are, by all likelihood, more accurate.⁹

To sum up, job turnover (reallocation) in Poland during the transition has been relatively high by OECD standards, substantially higher than reported in earlier studies. This supports the *a priori* view that economic transition is associated with an increase in job flows, in particular with the destruction of – presumably – low productivity jobs and simultaneous creation of higher productivity jobs. This intense process of reallocation of labor is characteristic of a dynamic labor market and thus undermines the commonly held view that the labor market in Poland is stagnant and immobile.

III. CHANGES IN JOB REALLOCATION OVER TIME

This section focuses on the “excess job reallocation,” i.e. the amount of job reallocation that results after taking into account the gross job reallocation needed to

⁹ Faggio and Konings (1999) used a sample of 834 large firms (i.e., firms satisfying at least one of the following conditions: employment greater than 100 workers, total assets and operating revenues exceeding USD 16m and USD 8m, respectively). We used a sample of 45,269 firms, not restricted by size, drawn from the census of all registered firms in Poland. Given that job turnover is heavily concentrated among small firms, Faggio and Konings’ results are bound to exhibit a substantial negative bias.

accommodate a given net employment growth. Put differently, the excess job reallocation (EJR) rate shows about the fraction of all jobs shifted away from contracting firms toward expanding firms.¹⁰ Thus, the EJR rate can be interpreted as a measure of the degree of enterprise restructuring.

The data on job reallocation support the view that the pace of restructuring accelerated in Poland in the late 1990s. The trend is not linear, however. Rather, it is U-shaped; that is job reallocation was high at the beginning of the transition, then declined in the mid-1990s, and then increased again, reaching, in the late 1990s, a level even higher than at the outset of the transition (see Table 2).¹¹ Specifically, the EJR rate was just under 15 percent in 1993, then fell to somewhat over 13 percent in 1996 and then increased sharply, reaching over 20 percent in 1999.

Table 2 Job gains and job losses

As percent of total employment	1993 ^{b)}	1996 ^{b)}	1999 ^{b)}	1999 ^{a)}
Gross job gains	7.5	7.5	10.2	9.7
Openings	2.9	2.5	4.7	4.4
Expansions	4.5	5.0	5.5	5.3
Gross job losses	9.7	6.6	11.1	11.5
Closures	0.6	0.5	1.3	1.4
Contractions	9.1	6.1	9.7	10.1
Net employment change	-2.2	0.9	-0.9	-1.8
Continuing establishments only	-4.5	-1.1	-4.3	-4.8
Job turnover	17.1	14.1	21.2	21.2
Continuing establishments only	13.6	11.2	15.2	15.4
Excess job reallocation	14.9	13.3	20.3	19.4
Continuing establishments only	9.0	10.1	10.9	10.5

a) Actual data.

b) Actual data and CSO estimates.

Source: Author's calculations.

¹⁰ This fraction is given by EJR/2; for example the EJR rate of 20 percent means that 10 percent of all jobs were reallocated from contracting firms to expanding firms.

¹¹ Strictly speaking, since only three data points are available, the observed pattern is V- rather than U-shaped. We have chosen U-shape to satisfy economists taste for smooth convex curves.

It is worth emphasizing that the degree of job reallocation reached in 1999 was high by OECD standards, indicating an intensive industrial restructuring. Some ten percent of all jobs were eliminated in the declining firms and moved to expanding firms.

The variation in the job reallocation rate over time is accounted for largely by the changes in the job destruction rate and, to a lesser extent, by changes in the job creation rate (Figure 1). In other words, the rate of job destruction has been more variable over time than the rate of job creation. Although the number of observations is much too small to generalize this finding, it is consistent with the pattern observed in developed market economies (den Haan, et al. 2000; Konings, 1992)

For example, the difference between the highest level of job creation (10.2 percent in 1999) and the lowest (7.5 percent in both 1993 and 1996) is less than three percentage points. In contrast, the difference between the highest level of job destruction (11.1 percent in 1999) and the lowest (6.6 percent in 1996) is almost five percentage points. The sharp increase in the job reallocation rate that took place between 1996 and 1999 was accounted for by the accelerated elimination of existing jobs rather than by a diminished creation of new jobs. Thus, the rate of job destruction has exhibited a stronger cyclical variability than the rate of job creation, which has been relatively stable.

What does the observed U-shaped pattern of changes in the job reallocation rate tell us about the Polish economy? The answer depends on the meaning one attaches to job reallocation. One assumption is that job reallocation entails destruction of low-productivity jobs and a shift of resources towards higher productivity jobs (Haltiwanger 2000). Thus, job reallocation presumably involves productivity improvements. Moreover, job reallocation is an indicator of economic restructuring and labor market dynamics, as it is associated with labor mobility and changes in the employment and output structure. Accordingly, the U-shaped pattern of job reallocation mirrors the pace and the intensity of economic restructuring in Poland. High job reallocation in early 1990s reflected a profound reallocation of inputs and outputs across producers associated with the initial transition shock. This initial shock included product market liberalization, opening to trade, privatization, the emergence of a new private sector. All these factors, which hit different industries and producers to a differing extent, brought about the wave of “creative

destruction”, and were reflected in the high job reallocation rate at the outset of transition. By the mid 1990s these initial impulses abated, which led to the fall in the job reallocation rate. In the late 1990s, according to a commonly held view, a new wave of restructuring has begun, this time engendered by the increased competition among firms, striving for higher productivity in order to survive in a more competitive environment. This “productivity drive” has involved the destruction of low productivity jobs, and the simultaneous creation of new, more productive jobs in firms which gained a competitive edge. The marked increase in job turnover in the late 1990s has been a reflection of this process. At the same time this increase provides empirical support to the view whereby Poland has entered a new stage of transition characterized by an intensified enterprise restructuring.

The most important consequence of the acceleration of job reallocation in the late 1990s was the rise in unemployment. Job reallocation has contributed to unemployment through two different channels. First, unemployment increased owing to greater labor market frictions and structural imbalances brought about by the accelerated restructuring. Second, unemployment increased as a result of the fall in the number of available jobs, which was caused by productivity improvements.

Frictional and structural unemployment. Job reallocation means that the displaced workers need to search for new jobs, which takes time and requires acquiring information on new job opportunities. Moreover, jobs that have been destroyed usually differ in salient characteristics (e.g. skills required to perform them, or location) from those which have been created. Thus, workers need to acquire new skills or move to different locations to find new jobs. Given that workers are not perfectly mobile, structural (skill and spatial) mismatches arise. That is, job reallocation gives rise to a mismatch between the skills demanded and supplied in a given area or causes an imbalance between the supplies of and demands for workers across areas. Frictional and structural unemployment are thus an unavoidable consequence of restructuring and associated reallocation of labor (Lilien, 1982, Abraham and Katz, 1986).¹²

¹² It should be noted that in a frictionless world the increase in job destruction – if matched by a proportionate increase in job creation – would not lead to the increase in unemployment. It is commonly assumed that the hiring function $H=f(V, U)$ is linearly homogenous in the number of vacancies, V , and

Productivity improvements. Job reallocation brings about productivity gains because supposedly it entails the destruction of low-productivity jobs and the creation of high-productivity jobs. Higher productivity means that the same output can be produced with fewer workers. And that was the case in Poland in the late 1990s: as a result of productivity improvements, the number of available jobs and thus employment fell despite the growth in output.

It needs to be stressed that the negative effect of productivity increase on unemployment has a short-term character, since in the longer term the increase in productivity leads to new investments which bring about new jobs and thus mitigate unemployment. Another way of looking at the link between productivity and unemployment is to observe that there is no secular trend of the increase in unemployment, which would have existed if rising productivity were causing joblessness.

To summarize, the increase in job turnover that took place in the late 1990s in Poland has likely caused the increase in unemployment in two ways. First, higher job reallocation has most probably created skill and regional mismatches which have contributed to structural unemployment. Second, higher job reallocation has likely led to an increase in productivity, which in the short-run might have resulted in some net job losses and associated increase in unemployment.

IV. JOB FLOWS BY EMPLOYER CHARACTERISTICS

Industry

The objectives of this section are (a) to identify industries which create/destroy the most jobs, and to categorize industries by the degree of job reallocation, (b) to determine if job turnover and its components are indicative of other measures of employment dynamics at the industry level, and (c) to determine the relative role of employment shifts within and between sectors in contributing to job reallocation.

Which industries created the most jobs? Table 3.1 list the top ten industries ranked by the job creation rate. Gross job gains took place largely in the transport industry, some manufacturing branches (coke and petroleum products, motor vehicles, rubber and plastic

unemployment, U (Layard et al., 1991). This means that if, say, the numbers of unemployed and vacancies

products, publishing), in services (insurance and pensions, hotels and restaurants) and other business activities, trade, and public administration. Among these, transport, coke and petroleum, and insurance and pension industries stand out as the largest creators of new jobs. In these industries the number of jobs created by expanding firms accounted for some 30 percent of initial employment.

Table 3.1 Ten industries with highest rates of job creation, 1999

Industry	Job creation rate	Share in employment
Land transport	34.0	2.3
Manufacture of coke and refined petroleum products	32.0	0.7
Insurance and pension funding	30.1	1.1
Publishing	20.9	0.6
Other business activities	19.7	2.4
Hotels and restaurants	17.3	0.8
Wholesale trade	15.9	4.6
Manufacture of motor vehicles	15.0	1.0
Public administration and defence	14.9	4.7
Manufacture of rubber and plastic products	14.9	0.8
Total	x	19.1

Source: CSO data, author's calculations.

Which industries lost the most jobs? The top ten industries with the highest job destruction rates are listed in Table 3.2. Transportation, manufacture of motor vehicles and

double, then the number of hirings will double too, leaving the unemployment rate unchanged.

other business activities are again at the top of the list, implying a large scale reallocation of jobs across firms (see below). Other industries where job destruction is high include some manufacturing branches (basic metals, transport equipment, leather, textiles), coal mining and agriculture.¹³ Coal mining stands out as by far the largest declining industry with the job destruction rate of 18 percent.

Table 3.2 Ten industries with highest rates of job destruction, 1999

Industry	Job destruction rate	Share in employment
Land transport	23.0	2.3
Manufacture of basic metals	22.4	2.2
Manufacture of other transport equipment	19.6	1.5
Other business activities	19.4	2.4
Manufacture of leather products	18.1	0.6
Coal mining	17.8	5.6
Manufacture of textiles	16.9	1.4
Agriculture	16.0	1.1
Other transport	15.8	3.3
Manufacture of motor vehicles	15.1	1.0
Total	x	21.4

Source: CSO data, author's calculations.

Which industries exhibited the largest job reallocation? Expectedly, transportation is the industry where job turnover is by far the highest (Table 3.3). The excess job reallocation rate is 46 percent, meaning that some 23 percent of all jobs in the transport sector were shifted from contracting firms to expanding firms. Among other intensely restructuring industries are “other” business activities, some manufacturing branches (motor vehicles, metal products, machinery, food, rubber and plastic products), construction, trade, and financial inter-mediation.

What does job turnover and its components tell us about an industry? Is it indicative of employment changes? Is it correlated with other measures of labor dynamics? These

¹³ Agriculture covers only registered firms and does not include individual farmers (who account for the bulk of the sector).

questions are answered by means of the correlation analysis, the results of which are shown in Table 4.

A few interesting observations emerge from the inspection of Table 4. First, the gross job creation rate is quite strongly ($r=.81$) associated with the net employment growth. By contrast, the association between the net employment growth and the job destruction rate is much weaker ($r=-.54$). Combined, these two results mean that a high rate of job creation matters much more for the industry employment growth than does a low rate of job destruction. Growing industries are those where a lot of new jobs are being created, not necessarily those where few jobs are being destroyed. A policy implication is that policies to stimulate employment should focus mainly on creating a favorable investment climate, less on protecting existing jobs.

Table 3.3 Ten industries with highest rates of excess job reallocation, 1999

Industry	Excess job reallocation rate	Share in employment
Land transport	46.1	2.3
Other business activities	38.9	2.4
Manufacture of motor vehicles	30.0	1.0
Construction	25.3	6.7
Manufacture of metal products	23.2	1.8
Wholesale trade	22.5	4.6
Manufacture of machinery and equipment NEC (not elsewhere classified)	20.7	2.7
Manufacture of food products and beverages	20.0	5.3
Financial intermediation	19.8	2.3
Manufacture of rubber and plastic products	19.6	0.8
Total	x	30.0

Note: The ranking is based on industries whose share in total employment is at least 0.3%.

Source: CSO data, author's calculations.

Table 4 Correlations among different measures of job and labor flows, 1999
Cross section of 57 industries; data weighted by initial industry employment

	Job creation	Job destruction	Job turnover	Employment growth	Excess job reallocation	Hiring rate	Separation rate	Labor turnover
Job creation	1							
Job destruction	0.0594	1						
Job turnover	0.8292	0.6073	1					
Employment growth	0.8065	-0.5422	0.3383	1				
Excess job reallocation	0.7081	0.3993	0.7872	0.3596	1			
Hiring rate	0.8966	0.0155	0.7223	0.7455	0.7186	1		
Separation rate	0.6212	0.4837	0.7653	0.2364	0.7417	0.8239	1	
Labor turnover	0.8202	0.2154	0.7734	0.5628	0.7611	0.9705	0.9362	1

Source: Author's calculations.

Second, the excess job reallocation rate – which measures the extent of restructuring – is more strongly correlated with the job creation rate ($r=.71$) than with the job destruction rate ($r=.40$). Moreover, industries differ more with respect to job creation than with respect to job destruction (standard deviations 6.8 and 4.8, respectively). Hence, it is job creation rather than job destruction that was a driving force behind industrial restructuring in the late 1990s.¹⁴

Third, employment growth is rather weakly but positively ($r=.36$) correlated with the excess job reallocation rate. This means that industry restructuring has little impact on net employment changes. If anything this impact tends to be positive, that is industries which restructure tend to grow faster. Thus, contrary to the common belief, industry restructuring is not necessarily associated with the decline in employment.

Fourth, *job* turnover accounts for only about 60 percent of *labor* turnover ($r=.77$), indicating that a substantial number of hiring and separations takes place in ongoing jobs, i.e. without job reallocation. This implies that labor turnover is an imperfect proxy for job turnover and, hence, only an approximate indicator of restructuring. This is of practical

¹⁴ This is in contrast to changes in excess job reallocation over time which, as noted earlier, are driven mainly by changes in job destruction. However, the fact that excess job reallocation is stronger correlated with job creation than with job destruction reflects the situation of negative net employment growth, which was specific to the late 1990s. If aggregate employment declines this means that in most industries job creations is lower than job destruction. This in turn implies that in most cases – by definition – excess job reallocation is proportional to job creation (see Annex 1), which accounts for the high correlation between those two variables.

importance, as the data on labor flows are routinely available, while data on job flows require special calculations using micro data sets. But the former are an imperfect substitute for the later, which are of more relevance. However, this negative finding should be qualified by a more positive one, which follows.

The hiring rate seems a pretty good predictor of the gross job creation rate ($r=.90$). In contrast, the separation rate is weakly correlated with the job destruction rate ($r=.48$). Accordingly, one can use the easily available hiring rate as an effective proxy for the job creation rate. Moreover, the hiring rate correlates with the net employment growth ($r=.75$) and with the excess job reallocation rate ($r=.72$). Thus, a high hiring rate is indicative of an industry's restructuring, while a low hiring rate is indicative of an industry's decline.

Does job reallocation in Poland take place mainly between or within industries? This is an important issue, which defines the nature of industrial restructuring. The dominance of the *between* component of job turnover would point to reallocation of resources from declining industries to growing ones, while the dominance of the *within* component would indicate that resources are reallocated from contracting toward expanding firms within an industry.

The standard decomposition of the excess job reallocation index (Davis and Haltiwanger, 1990) shows that *between* industry job shifts account for 21.2 percent of the excess job reallocation index and *within* industry shifts account for the remaining 78.8 percent. Hence, the dominant form of restructuring in Poland is *intra*-industry reallocation of jobs. Still, it is worth noting that the magnitude of the *between* component reported in this paper is markedly larger than that reported by Faggio and Konings (1999), who report a figure of 15.7 percent for 1997.¹⁵ The *inter*-industry part of job reallocation in Poland is thus larger than so far assumed. It is also worth stressing that the predominance of within sector reallocations is a typical feature, not specific to Poland (Haltiwanger, 2000).

To sum up:

¹⁵ Part of this difference is probably accounted for by the fact the Faggio and Konings use a one-digit classification of industries, while we use a two-digit classification. Clearly, the narrower is the definition of an industry, the larger the inter-industry flows are likely to be.

- Net employment growth correlates strongly across industries with gross job creation, but rather weakly with gross job destruction. This implies that employment growth hinges on favorable investment climate, not on forestalling the elimination of unviable jobs.
- Industrial restructuring (as measured by excess job reallocation) does not necessarily imply job destruction. To the contrary, restructuring, job creation and employment growth often go hand in hand.
- Reallocation of jobs among firms within an industry is a dominant form of restructuring in Poland, similarly as in mature market economies. Job flows across industries play a secondary role in industry restructuring.

Table 5 Correlation coefficients) between job flows, employment growth and job reallocation, 1999 (16 voivodships)

	Gross Job Creation	Gross Job destruction	Job Turnover	Employment growth	Excess job reallocation	Hiring rate	Separations rate	Labor turnover
Gross Job Creation	1.000							
Gross Job destruction	-0.522	1.000						
Job Turnover	0.589	0.381	1.000					
Employment growth	0.890	-0.853	0.156	1.000				
Excess job reallocation	0.539	0.006	0.590	0.327	1.000			
Hiring rate	0.838	-0.418	0.512	0.736	0.489	1.000		
Separations rate	0.008	0.538	0.518	-0.283	0.260	0.442	1.000	
Labor turnover	0.579	-0.026	0.603	0.368	0.462	0.901	0.788	1.000

a) Unweighted data.

Note: Coefficients r are significantly different from zero at the 5% confidence level in a two-sided test when $r > .496$

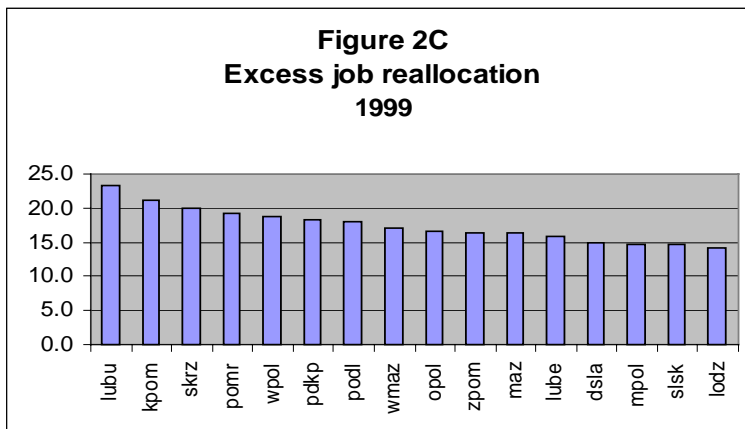
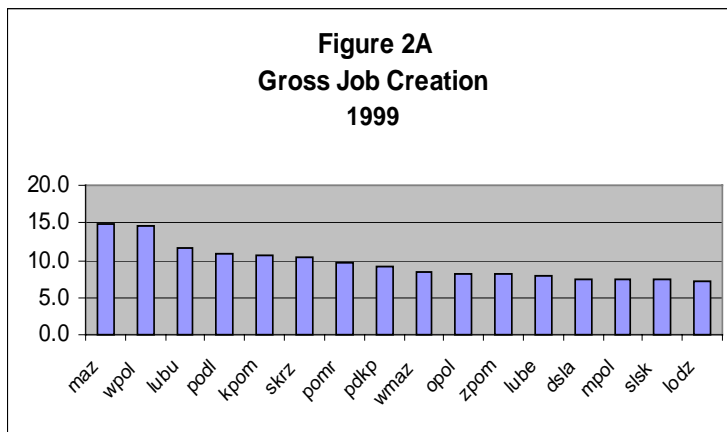
Source: Author's calculations.

Region

This section focuses on the regional dimension of job flows. It has three purposes: (a) to identify regions (*voivodships*) where the job flows are the largest, (b) to determine the relationship between different measures of labor dynamics, and (c) to determine the relative importance of between- and within-region job flows. The latter

issue is relevant, *inter alia*, for determining to what extent Polish regions form separate labor markets.

Regional variation in job flows is quite substantial (Figure 2). The job creation rate (Panel A) ranges from about 15 percent (Mazowieckie and Wielkopolskie) to less than 8 percent (Lodzkie, Slaskie, Dolnoslaskie, Malopolskie). It is interesting that job creation rates can be much different in neighboring regions with similar degree of urbanization and industrialization. For example, the job creation rate in Mazowieckie (capital region) is twice as high as in neighboring Lodzkie (Lodz is the second largest Polish city). Similarly, the job destruction rate (Panel B) ranges from less than 9 percent (Mazowieckie) to over 16 percent (Opolskie).



Thus, the most successful regions create twice as many jobs as the least successful ones. The same ratio occurs in the case of job losses. Still, the regional variation in both job creation and job destruction is relatively low.¹⁶ Importantly, however, on average regions differ more in terms of job creation (standard deviation of 2.4 percentage points) than in terms of job destruction (standard deviation of 2.1 percentage points).

Given that job gains and job losses are negatively correlated across voivodships (see below), regions differ little in terms of job turnover and excess job reallocation (Figure 2 Panel C). For example, the excess job reallocation rate varies from 14.2 in the Lodzkie voivodship to 23.2 in the Lubuskie voivodship. This means that most regions restructure their economies to a similar degree. However in the majority of cases (12 out of 16) job reallocation took place in the context of the declining overall number of jobs. This implies that in most voivodships, the excess job reallocation rate was determined by the rate of job creation. In other words, in the late 1990s the rate of job creation was a binding constraint for the pace of restructuring.¹⁷

What is the relationship between job flows, employment growth and restructuring? Table 5 presents relevant correlation coefficients. It should be borne in mind that the number of observations (16) is small, thus the figures are subject to wide margins of error and need to be interpreted with caution. With this caveat in mind, we would like to highlight the following relationships:

- Negative (modest but significant) correlation between job creation and job destruction.¹⁸ Voivodships which destroy a large number of existing jobs tend to create a few new jobs.
- Strong correlation of employment growth with job creation as well as with job destruction.¹⁹ This implies that at the regional level policies to foster employment

¹⁶ This assessment is based on low values of the coefficient of variation (25.3% for job creation and 18.3% for job destruction), rather than on an international benchmark (which is not available).

¹⁷ By definition, job creation limits (determines) the degree job reallocation in the declining regions while job destruction limits the degree of job reallocation in the growing regions.

¹⁸ This is in contrast to the industry level analysis, where there is no correlation between job creation and destruction.

growth should be two pronged. First, they should promote creation of *new* jobs through building an enabling investment climate. Second, they should hedge against idiosyncratic shocks to avoid massive losses of *existing* jobs, for example through diversifying their economic structure.

- A lack of correlation between employment growth and excess job reallocation. This means that the extent of industrial restructuring at the regional level does not affect the rate of employment growth.
- Excess job reallocation correlates with job creation, but *not* with job destruction. This supports an earlier finding that the pace industrial restructuring is determined more by the rate of job creation, and less by the rate of job destruction.

Are jobs reallocated mainly between or within regions? The decomposition of the excess job reallocation index for 1999 shows that the dominant part is played by the *within* component of job reallocation. Specifically, as much as 85.9 percent of excess job reallocation comes from job shifts within regions, and only 14.1 percent results from job shifts between regions. These figures are similar in magnitude to those obtained by Faggio and Konings (1999). They report the *between* component accounting for 12.3 percent of excess job reallocation in 1996 and for 26.6 percent in 1997.²⁰

This small magnitude of the *between* component reflects the fact that a vast majority of Polish regions experienced a net fall in employment in 1999 and only a few (4 out of 16) experienced an employment growth.²¹ Accordingly, the scope for reallocation of jobs away from declining regions toward growing regions was limited. A more general interpretation would be that this result points to low inter-regional mobility

¹⁹ Again, this is in contrast to the industry level analysis, where employment growth correlates strongly with job creation, but only weakly with job destruction.

²⁰ It should be noted that Faggio and Konings made their calculations for 49 voivodships while the result presented in this paper refers to 16 “new” voivodships which were created in 1999 as a part of an administrative reform. Accordingly, the results are not directly comparable; a smaller number of regional units is likely to result in the smaller magnitude of the “between” component.

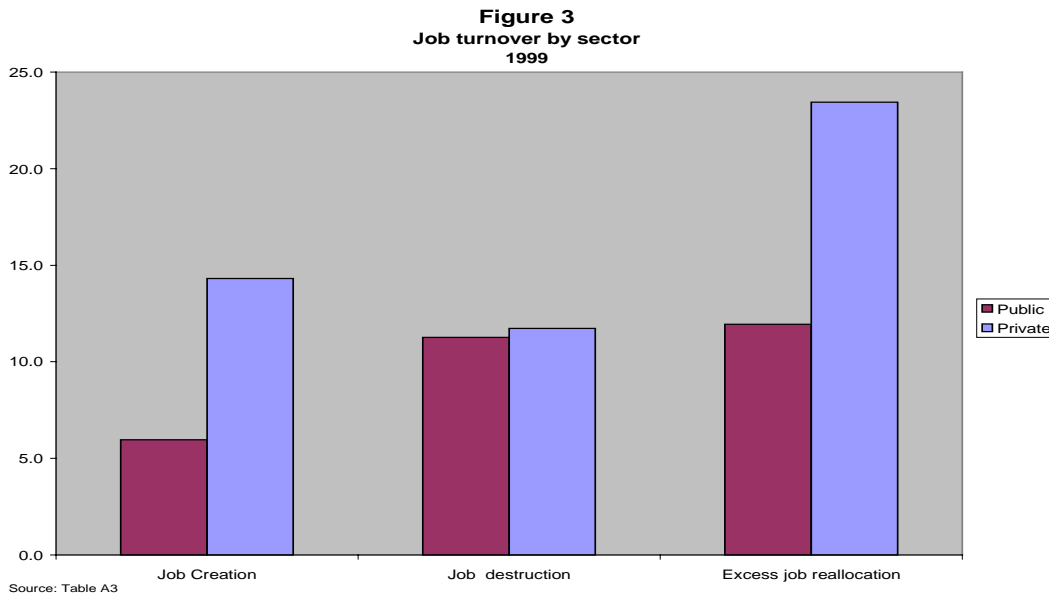
²¹ This is a *prima facie* cause of the small size of the *between* component, as by definition (strictly speaking, by the decomposition formula), if in all regions the changes in employment have the same sign (either all negative or all positive) then the *between* component is equal to zero. The *between* component is the higher the more of opposite signed employment changes are observed across regions.

of labor and thus supports an often held view that Polish voivodships form a separate, relatively independent labor markets.

Firm ownership

According to conventional wisdom, the private sector is more dynamic than the public one. It is assumed to be more prone to take risks and introduce innovations, which inherently involves the destruction of old products and processes. Correspondingly, one would have assumed that the rates of job destruction and job creation are significantly higher in the private sector. In this section we examine data on job turnover to see if this view of the private sector is borne out by statistical evidence.

Even a brief look at Figure 3 leaves no doubt that job turnover in the private sector is markedly higher than in the public sector. The difference lies predominantly in



the rate of job creation, rather than in the rate of job destruction. The private sector creates annually over twice as many jobs (relative to its employment) as the public sector. In contrast, the rates of job destruction are in both sectors virtually the same. This is not surprising if one takes into consideration that the private/public sector employment mix has not reached an equilibrium yet. Ongoing privatization means the expansion of the private sector and the contraction of the public sector, and is essentially a disequilibrium

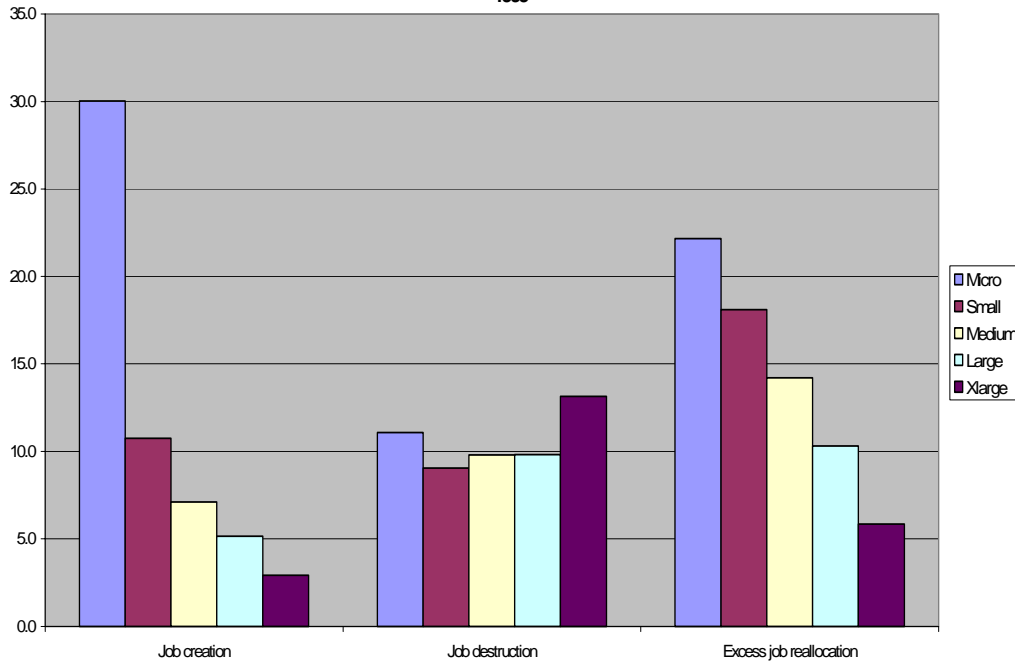
phenomenon. This is likely to imply that during the privatization process the actual rate of job destruction in the public sector is higher than the equilibrium one.

The high rate of job creation in the private sector (over 14 percent) implies a high rate of excess job reallocation (over 23 percent). This rate means that in 1999 almost 12 percent of all private sector jobs were shifted from contracting firms to expanding firms. In contrast, in the public sector the pertinent figure was six percent, i.e. half as much as in the private sector. In this sense the industrial restructuring in Poland has been driven largely by job reallocation within the private sector.

Firm size

Small firms are creating jobs, large firms are destroying them. Is this popular view correct? Only partly. In this section we will show that indeed small firms expand at a higher rate than large ones, but this does not imply that they create more jobs. In fact they do not. Moreover, small firms lose jobs at a rate that is the same as in large firms.

Figure 4
Job flows by firm size
1999



Source: Table A4

Figure 4 shows, the rate of job creation declines monotonically with the firm size, and that the differences are considerable. The rate of gross job creation in micro firms (1-5 workers) is 30 percent, twice as much as in small firms (6-20 workers). In turn, the rate of job creation in small firms, is twice as high as in large firms (100-200 workers) and over three times as high as in very large firms. A caveat is necessary however that to some extent this result may have a formal character, as with the low initial employment levels small absolute changes result in large rates of growth. In other words, the same absolute change in employment in small and large firms, results in higher employment growth rates in the former than in the latter. Small firms expand at a much higher rate than large ones. However, this does not necessarily imply that they create more jobs in absolute terms. To the contrary, it is large firms which in absolute terms created more jobs than small firms (Table 6). The most striking fact is that the large proportion of new jobs are created by start-ups, as opposed to existing firms.²² This points to the critical role of the cost of starting a new business (also referred to as the cost of the first job) in employment creation.

Table 6 Employment gains and loses by firm size, 1999

Firm size (employment)	Job gains	Job loses	Net employment change ^{a)}
	% of total		
Startup	45.8	x	4.4
Micro (-5)	3.0	0.9	0.2
Small (6-20)	9.7	6.9	0.1
Medium (21-100)	19.6	22.8	-0.7
Large (101-200)	6.4	10.3	-0.6
Xlarge (201+)	15.6	59.1	-5.3
Total	100.0	100.0	-1.8

a) As a percentage of total initial employment.

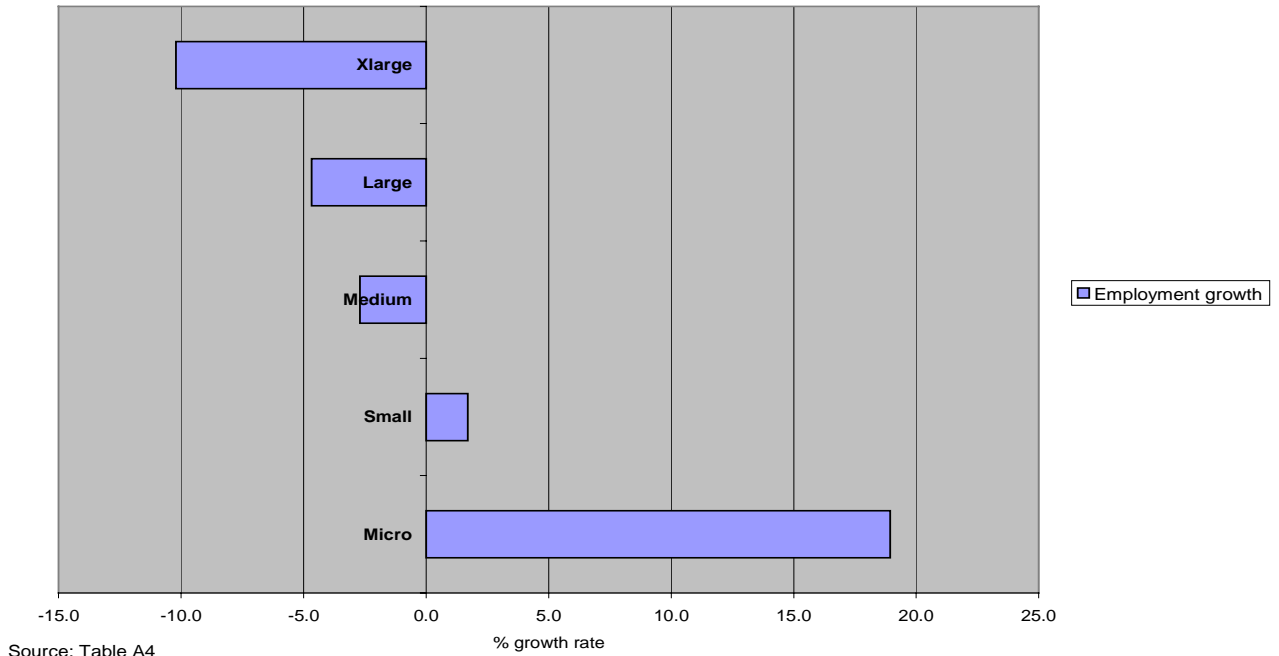
Note: The figure for "start-ups" may be biased upward as CSO in coding data does not distinguish between 0s (genuine start-ups) and missing values.

²² This finding is in contrast to that for the US, where most of new job creation is by *existing* firms (Davis and Haltiwanger, 1990). Owing to statistical problems (see note to Table 6) the result for Poland should be regarded as tentative and further research is necessary to test its validity.

Accordingly, some existing firms for which initial employment level was missing might have been miscategorized as start-ups.

Source: CSO data; Author's calculations.

Figure 5
Employment growth by firm size
1999



In contrast to job creation, job destruction rate is not affected by firm size. Small firms destroy jobs at a similar rate – around 10 percent – as large firms. Only in very large firms (200+ workers) the job destruction rate is somewhat higher than in other firms. One straightforward implication of the discrepancy between job creation and job destruction rates by firm size is that employment in smaller firms grows much faster than in larger ones (Figure 5).

In larger firms relatively low job destruction rates often translate into large absolute job losses (Table 6). After all, the bulk of all jobs was lost in large firms. Specifically, almost 60 percent of total job losses took place in firms employing more than

200 workers, and as much as 70 percent of job losses took place in firms employing more than 100 workers.

Expectedly, small firms exhibit much larger job turnover than big firms. Within the small firm sector, roughly 10 percent of jobs are reallocated during a year from contracting to expanding firms. In contrast, in the large firm sector only 3 to 5 percent of jobs are shifted from contracting to expanding firms.

To conclude, small firms are characterized by a higher job creation rate and higher job turnover than large firms. In contrast, firm size does not affect the job destruction rate, which is virtually the same for small and large firms. Still, it is large and medium firms, not small firms, which create most new jobs. In addition, a large part of new jobs comes from business start-ups. This implies that policies to improve investment climate and to lower the cost of starting a business, including the costs of creating the first job, can play a key role in generating employment growth.

VIII. CONCLUSIONS

In a broad sense, job turnover is an indicator of labor market flexibility and dynamics. It tends to be low in labor markets that are rigid and stagnant, and it is high in labor markets that are flexible and vibrant. In a more narrow sense, job turnover is an indicator of economic restructuring: it measures the intensity of reallocation of labor away from low productivity toward high productivity jobs.

Our analysis indicates that the labor market in Poland, contrary to what is often claimed, is relatively flexible and dynamic. The rate of job turnover observed in Poland in the late 1990s is comparable to that in OECD countries with flexible labor markets. In the late 1990s over 10 percent of all jobs was reallocated from contracting firms towards expanding firms. This implies an intense process of economic restructuring.

The rate of job turnover has varied during the transition in Poland, exhibiting an U-shaped pattern. It was high in the early years of the transition, then it fell visibly in the mid-1990s, and rose again in the late 1990s. In the early years of the transition the high job reallocation rate was as result of various demand and supply shocks that were engendered by the liberalization of the economy and opening it to international

competition. Over time the impact of these initial changes has tapered-off. The, in the late 1990s a new wave of enterprise restructuring began, this time spurred by firms striving to survive and expand in an increasingly competitive environment. Expectedly, this recent wave of restructuring, associated with intensive job reallocation, led to substantial productivity improvements (of which there is plenty of independent evidence), but also to a marked increase in unemployment.

The increase in unemployment to a large part stemmed from skill and spatial mismatches created by the rising rate of job reallocation. However, it was aggravated by the fact that the increase in job reallocation that took place in the late 1990s was driven by the increase in job destruction more than by the increase in job creation. The overall number of jobs fell and as a result unemployment increased. In other words, intensified enterprise restructuring brought about substantial productivity gains, which – given the rate of output growth – caused the employment decline.

Job reallocation takes place both within and between sectors and regions. Given that central planning led to misallocation of resources, including labor, one would have expected that once the economy is liberalized, the between effect, redressing the inherited misallocation problem, is predominant. This might have indeed be the case at the early stage of the transition, but not in the late 1990s. Along with the progress of the transitions the within effect has become dominant. At present in Poland job reallocation largely takes place within (rather than between) industries and regions. This is a pattern prevailing in mature market economies.

As expected, job reallocation is substantially higher in the private sector than in the public sector. Interestingly, the rate of job destruction is virtually the same in both sectors, it is the rate of job creation that is much higher in the private sector than in the public sector.

Job turnover is also much higher in small than in large firms. Again, small and large firms differ in terms of the job creation rate, not in terms of the job destruction rate. The larger the firm size, the lower the job creation rate, although in small firms a high job creation rate does not necessarily imply large absolute employment gains. Still, net

employment growth is heavily concentrated in small firms. In particular, newly established firms account for large part of job creation and net employment growth.

Policy implications of the analysis are straightforward. Job destruction is a necessary components of economic restructuring and thus an inescapable part of economic growth. Policies to foster employment growth and prevent unemployment should therefore focus on encouraging job creation rather than on forestalling job destruction and protecting non-viable, low productivity jobs. The means to foster job creation is to promote competitive product markets, remove barriers to the entry of new firms, to create a favorable investment climate and an enabling business environment.

ANNEX 1.

FORMULAS

Gross job creation rate, JC :

$$JC = \Delta E^e / E_0,$$

where: ΔE^e = sum of employment gains in expanding firms, E_0 = total initial employment.

Gross job destruction rate, JD :

$$JD = |\Delta E^c / E_0|,$$

where: ΔE^c = sum of employment losses in contracting firms,

Job reallocation (turnover) rate, JR :

$$JR = JC + JD$$

Net employment growth rate, \hat{E} :

$$\hat{E} = \Delta E / E_0 = JC - JD$$

where: ΔE = change in employment over a specified period

Excess job reallocation rate, EJR :

$$EJR = JR - |\hat{E}| = 2 * \min\{JC, JD\}$$

where: JC = gross job creation rate, JD = gross job destruction rate, JR = gross job reallocation (turnover) rate, \hat{E} = net employment growth.

ANNEX 2: SAMPLE DESCRIPTION (1999)

Table S1 Original sample description, 1999

All observations				
Employment 1998	Employment 1999			
	0	>0	missing	Total
<0	3	4	0	7
0	1229	8146	69	9444
>0	8	43346	486	43840
Missing	19	2420	2687	5126
Total	1259	53916	3242	58417

Actual observations only (GUS estimated observations excluded)				
Employment 1998	Employment 1999			
	0	>0	missing	Total
0	23	281	69	373
>0	6	28507	486	28999
Missing	19	2420	2687	5126
Total	48	31208	3242	34498

Table S2 Cleaned sample description, 1999

All observations				
Employment 1998	Employment 1999			
	0	>0	missing	Total
0	1320	10569	0	11889
>0	494	43347	0	43841
Missing	0	0	2687	2687
Total	1814	53916	2687	58417

Actual observations only (GUS estimated observations excluded)				
Employment 1998	Employment 1999			
	0	>0	missing	Total
0	111	2700	0	2811
>0	492	28508	0	29000
Missing	0	0	2687	2687
Total	603	31208	2687	34498

Table S3 Working (cleaned) sample description, 1999

Actual observations only (GUS estimated observations excluded)				
Firm history	Firms			
	Frequency	Percent		
Opening	2700	8.52		
Continuing	28508	89.93		
Closing	492	1.55		
Total	31700	100		

ANNEX 3 BACKGROUND TABLES

Table A1 Job and labor turnover by industry

All establishments (including newly established and closed ones) using only actual data

ISIC Code	Industry	Gross job creation	Gross job destruction	Job turnover	Net employment growth	Excess job reallocation	Hiring rate	Separation rate	Labor turnover
1	Agriculture	3.8	16.0	19.8	-12.2	7.6	15.7	27.9	43.6
2	Forestry	3.6	7.4	11.1	-3.8	7.2	10.7	14.5	25.2
5	Fishing	1.9	6.8	8.8	-4.9	3.9	18.0	22.9	40.8
10	Coal mining	6.2	17.8	24.1	-11.6	12.5	13.1	24.7	37.8
13	Metal ores	8.3	0.0	8.3	8.3	0.0	16.7	8.3	25.0
14	Other mining	3.7	10.9	14.6	-7.2	7.4	12.7	19.9	32.6
15	Food	10.0	11.4	21.3	-1.4	20.0	27.9	29.3	57.2
16	Tobacco	0.7	6.8	7.5	-6.0	1.5	10.1	16.2	26.3
17	Textiles	3.7	16.9	20.6	-13.1	7.4	17.9	31.0	48.9
18	Waring apparel	7.6	12.9	20.4	-5.3	15.1	22.3	27.6	49.8
19	Leather	9.6	18.1	27.7	-8.6	19.1	31.9	40.4	72.3
20	Wood	8.8	9.6	18.4	-0.8	17.7	28.6	29.4	58.0
21	Paper	6.0	14.3	20.3	-8.3	12.0	24.9	33.2	58.2
22	Publishing	20.9	9.3	30.2	11.6	18.6	41.0	29.4	70.4
23	Coke	32.0	2.0	34.0	30.0	3.9	50.4	20.4	70.8
24	Chemical	2.5	9.5	12.0	-6.9	5.1	10.2	17.1	27.4
25	Rubber and plastic	14.9	9.8	24.7	5.1	19.6	37.0	32.0	69.0
26	Non-metal mineral products	6.7	12.1	18.8	-5.4	13.4	22.5	27.9	50.4
27	Basic metals	1.7	22.4	24.2	-20.7	3.5	5.5	26.1	31.6
28	Metal products	12.2	11.6	23.8	0.5	23.2	26.3	25.8	52.2
29	Machinery	10.4	14.5	24.8	-4.1	20.7	18.2	22.3	40.5
30	Office machinery	22.0	5.1	27.1	17.0	10.1	39.9	22.9	62.8
31	Electrical machinery	8.2	12.5	20.7	-4.3	16.3	19.7	24.0	43.8
32	RTV equipment	8.5	5.6	14.1	2.9	11.2	20.8	17.9	38.7
33	Precision instruments	6.6	12.9	19.5	-6.3	13.2	15.8	22.1	37.9
34	Vehicles	15.0	15.1	30.1	-0.1	30.0	23.8	23.8	47.6
35	Transport equipment	3.6	19.6	23.2	-16.0	7.2	10.8	26.9	37.7
36	Furniture	9.4	6.9	16.3	2.5	13.8	30.1	27.6	57.7
37	Recycling	8.3	5.1	13.5	3.2	10.3	23.4	20.2	43.7
40	Electricity and gas	1.4	4.6	6.0	-3.2	2.8	5.6	8.8	14.4
41	Water	3.2	2.7	6.0	0.5	5.5	11.7	11.2	22.9
45	Construction	12.7	13.0	25.6	-0.3	25.3	41.3	41.6	82.9
50	Car services	14.7	9.2	23.9	5.5	18.4	36.5	30.9	67.4
51	Wholesale trade	15.9	11.3	27.1	4.6	22.5	40.0	35.5	75.5
52	Retail trade	13.2	9.1	22.3	4.1	18.3	33.8	29.7	63.5
55	Hotels and restaurants	17.3	8.7	26.0	8.6	17.4	39.1	30.6	69.7
60	Land transport	34.0	23.0	57.0	11.0	46.1	51.0	40.0	91.0
61	Water transport	0.1	26.8	26.9	-26.7	0.2	10.5	37.2	47.7
62	Air transport	13.5	1.9	15.4	11.5	3.8	36.5	25.0	61.5
63	Other transport	3.8	15.8	19.6	-12.0	7.6	8.8	20.7	29.5
64	Post and telecommunications	4.6	2.5	7.1	2.1	5.0	13.8	11.7	25.5
65	Financial intermediation	12.0	9.9	21.9	2.1	19.8	24.2	22.1	46.3
66	Insurance and pension funding	30.1	0.9	31.0	29.3	1.7	62.6	33.4	96.0

67 Other financial intermediation	28.9	8.6	37.5	20.3	17.3	57.1	36.8	93.9
70 Real estate	9.3	5.8	15.2	3.5	11.6	22.0	18.5	40.6
71 Renting of machinery and equipment	22.9	8.5	31.4	14.4	17.0	52.5	38.0	90.5
72 Computer	17.0	7.8	24.8	9.1	15.7	36.9	27.7	64.6
73 R&D	2.8	6.1	8.9	-3.3	5.6	9.8	13.1	22.8
74 Other business activities	19.7	19.4	39.2	0.3	38.9	56.9	56.7	113.6
75 Public administration and defence	14.9	7.5	22.4	7.4	15.0	36.1	28.7	64.9
80 Education	6.8	7.6	14.4	-0.9	13.5	14.4	15.3	29.7
85 Health	3.9	11.2	15.0	-7.3	7.8	11.8	19.0	30.8
90 Sewage	7.3	7.1	14.4	0.3	14.1	30.7	30.4	61.0
91 Activities NEC	2.9	3.7	6.6	-0.8	5.8	8.7	9.5	18.2
92 Recreation	8.5	4.9	13.4	3.6	9.8	22.2	18.5	40.7
93 Other services	19.8	5.4	25.2	14.5	10.7	39.3	24.8	64.1
95 Household employment	0.0	20.0	20.0	-20.0	0.0	0.0	20.0	20.0
Mean	10.5	10.3	20.8	0.2	12.8	25.6	25.4	51.0
StDev	8.2	5.9	9.3	10.9	9.0	14.8	9.2	22.1
CV	78.4	57.3	44.8	5033.4	70.7	57.9	36.1	43.4

Table A2 Job turnover by voivodship, 1999

	Gross Job Creation	Gross Job destruction	Job Turnover	Net employment growth	Excess job reallocation	Hiring rate	Separations rate	Labor turnover
Dolnska	7.5	13.3	20.8	-5.8	15.0	25.2	31.0	56.2
Kujpom	10.6	11.7	22.3	-1.1	21.2	25.9	27.0	52.9
Lubel	8.0	11.4	19.4	-3.5	15.9	20.8	24.2	45.0
Lubus	11.7	13.6	25.3	-2.0	23.3	29.1	31.1	60.2
Lodz	7.1	10.7	17.8	-3.6	14.2	20.6	24.2	44.8
Malopol	7.4	10.9	18.3	-3.6	14.7	19.2	22.8	42.0
Mazow	14.8	8.2	22.9	6.6	16.3	33.7	27.1	60.9
Opol	8.2	16.5	24.7	-8.2	16.5	22.0	30.2	52.2
Podkarp	9.2	12.5	21.7	-3.3	18.4	19.5	22.9	42.4
Podlas	10.9	9.0	19.9	1.9	18.0	25.7	23.8	49.5
Pomor	9.7	12.4	22.0	-2.7	19.3	26.7	29.4	56.2
Slask	7.3	13.3	20.6	-6.0	14.6	17.9	23.9	41.8
Swkrzy	10.4	10.0	20.4	0.4	20.0	24.2	23.8	48.1
Warmaz	8.5	10.0	18.5	-1.5	17.0	26.1	27.6	53.7
Wlkpol	14.7	9.3	24.0	5.3	18.7	29.1	23.7	52.8
Zachpom	8.2	13.3	21.5	-5.1	16.4	23.3	28.4	51.7
Mean	9.6	11.6	21.3	-2.0	17.5	24.3	26.3	50.6
StDev	2.4	2.1	2.2	4.0	2.6	4.3	3.0	6.2
CV	25.3	18.3	10.6	-198.0	14.7	17.5	11.4	12.2

Source: Author's calculations.

Table A3 Job turnover by public/private sector, 1999

Sector	Gross Job Creation	Gross Job destruction	Job Turnover	Net employment growth	Excess job reallocation
<i>All establishments</i>					
Public sector	6.0	11.3	17.2	-5.3	11.9
Private sector	14.3	11.7	26.0	2.6	23.4
<i>Continuing establishments</i>					
Public sector	2.7	9.8	12.5	-7.1	5.4
Private sector	8.6	10.7	19.4	-2.1	17.2

Source: Author's calculations.

Source: ansect99.log

Table A4 Job turnover by firm size, 1999

Firm size	Gross job creation	Gross job destruction	Job turnover	Employment growth	Excess job reallocation	Share in employment (%)
Micro	30.0	11.1	41.1	18.9	22.2	1.0
Small	10.7	9.0	19.8	1.7	18.1	8.7
Medium	7.1	9.8	16.9	-2.7	14.2	26.7
Large	5.2	9.8	15.0	-4.7	10.3	12.0
Xlarge	2.9	13.1	16.1	-10.2	5.8	51.6

Note:

Micro: 1-5 employees

Small: 6-20 employees

Medium: 21-100 employees

Large: 100-200 employees

Xlarge: 200+ employees

Micro firms (1-5 workers) are considerably underrepresented in the REGON register (which is the sample frame for the survey)

Sample covers all establishments, including newly established and closed ones. However, job creation/destruction rates cannot be calculated for newly established firms (by definition, in newly established firms employment in 1998 was zero).

Source: Author's calculations.

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