No. 136 | February 1995 | Discussion Papers

Statistics Norway
Research Department

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Discussion Papers No. 136 • Statistics Norway, February 1995

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Abstract:
The labour market in Norway, as in other Scandinavian countries, is often claimed to be overregulated and incapable of adjustment to changes in job opportunities. The results presented in this paper suggest to the contrary that in terms of job creation and job reallocation between plants, the manufacturing sector in Norway is surprisingly flexible, and similar to the manufacturing sector in other OECD countries such as the U.S. We show that 8.4 percent of the manufacturing jobs are eliminated annually, while new jobs constitute 7.1 percent of manufacturing employment, in an average year. Even in a serious recession year, a considerable number of new jobs are created. The paper also examines job creation in small versus large plants (and firms), as well as young versus old plants. The results provide support to selection models a la Jovanovic (1982), while vintage-capital models seem to be largely irrelevant as models of plant heterogeneity.

Keywords: Job creation, job destruction, entry and exit.

JEL classification: E32, J23, J63

Acknowledgement: Thanks to Rolf Aaberge, Ådne Cappelen, John Dagsvik, Steinar Holden, Kalle Moene, Knut Moum, seminar participants at the University of Oslo and the ADRES-conference for helpful comments on an earlier draft. We gratefully acknowledge financial support from Norwegian Research Council.

Paper presented at the conference ADRES 1993 on "Microeconomics of Human Resource Management: Multinational Studies of Firm Practices", in Paris, December 7-9, 1994.

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1 Introduction[1]

The labour market in Norway, as in other Scandinavian countries, is often claimed to be over-regulated and incapable of adjustment to changes in job opportunities, at least in the domestic policy debate. This line of argument asserts that the Norwegian manufacturing sector has an inflexible structure, and survives despite its lack of flexibility largely because of protection and governmental subsidies[2]. Our results suggest to the contrary that in terms of job creation and job reallocation between plants, the manufacturing sector in Norway is surprisingly flexible, and similar to the manufacturing sector in other OECD countries such as the U.S.

Empirical research for other OECD countries have revealed large rates of simultaneous job creations and job destructions within narrowly defined manufacturing sectors, and throughout the business cycles. We document similar patterns of job creations and job destructions for Norwegian manufacturing. The results confirm the view that there is a lot of job mobility at the micro level, reflecting a substantial amount of heterogeneity of employment changes at the plant level.

The Norwegian evidence is interesting in an international perspective, as Norway has a distinct macroeconomic record for the period we consider. Norway experienced a large increase in oil revenue from 1976 to 1986. Compared to most other European countries, the unemployment rate in Norway has been very low, below 4 percent throughout the period we consider (1976-86); see figure 1. The business cycle pattern is characterized by the slumps in 1978 and, more severely, in 1981-82, and the boom from 1984 to 1986. Clearly, the period we consider covers a number of interesting events which affect job creation and job destruction. With this macroeconomic background, it is somewhat surprising to find that job creation and job destruction in Norway has a similar magnitude and pattern to US and other OECD economies.

Notice that despite the macroeconomic differences from most other European countries, the manufacturing employment has declined with a similar rate in Norway compared to e.g. the European Union (EU). Over the period we consider, Norwegian manufacturing employment fell with 5.6 percentage points (from 22.7 percent in 1976 to 17.1 percent in 1986) as a share of total employment, while the corresponding figure for the EU from 1974 to 1986 is 5.5 percentage points[3].

[1] This paper summarizes section IV of Klette and Mathiassen (1995, in Norwegian).

[2] This view was emphasized in the report of the Norwegian Employment Commission (Ministry of Finance, 1992, see in particular chapters 14.7 and 14.8). See also OECD (1994a, p.79).

[3] See OECD (1991, table 2.11).

Figure 1: **Macroeconomic indicators for the Norwegian economy 1976-86. Percentages.** *Symbols: □ - The unemployment rate ○ - GNP growth; △ - Government surplus relative to GNP;.*

Our paper is inspired by studies of US manufacturing by Dunne et al. (1989), Davis and Haltiwanger (1992) and Davis et al. (1993), and we relate our findings to their results[4]. Dunne et al. studied plant turnover and job creation in the longer run (5 year periods), and followed the cohorts over a long time period. Davis and Haltiwanger considered job creation from year to year. Davis et al. examined the importance of small plants and firms for job creation and job destruction. The OECD (1987)[5] study of job creation and job destruction in France, Sweden, and (West-) Germany is also closely related to our study, and will provide some perspective on our findings. Job creation and destruction in Canadian manufacturing have been extensively

[4]Several of the patterns pointed out in our paper and in related studies, were emphasized in the study of Norwegian plants and firms by Wedervang 30 years ago (Wedervang, 1965). Wedervang focused on the empirical patterns of plant heterogeneity, turnover and growth, but paid little attention to job turnover.

[5]See also OECD (1994b) for more recent figures.

studied by Baldwin and Gorecki (1990) and Baldwin et al. (1994). We have followed the studies cited above in several ways in order to facilitate cross-country comparisons, and we will present some of their findings below.

Section 2 provides operational definitions of job creation, job destruction, and related concepts. This section also discusses our data sources, which have some advantages compared to data used in similar studies for other countries. Section 3 lays out our primary findings on the extent of job creation and destruction in Norwegian manufacturing. This section pays particular attention to the importance of plant turnover and the role of small and medium sized plants and firms. Section 4 examines the relationship between our findings and various theories on labour demand, firm growth and job creation. We summarize and discuss our main findings in section 5.

2 Definitions and data

A. Defining job creation and job destruction

It is by now well established in the literature to relate the amount of job creation and job destruction to the difference in employment in establishments between two periods. *Job creation* is the difference in employment in all establishments which increase employment between the two time periods, while *job destruction* is the corresponding number for all establishments which reduce their employment. Appendix A presents a formal definition of job creation and related concepts. *Net job creation* is the difference between job creation and destruction. *Gross job reallocation* – also termed *total job-turnover* in the literature[6] – is the sum of job creation and job destruction. Gross job reallocation includes both movements of jobs between plants and net changes in the number of jobs. All the concepts defined here (job creation, job destruction, net job creation, and gross job reallocation) can be defined at the sectorial level or at the aggregate level.

Our measure of job creation does not capture changes in the plant's composition of different kinds of jobs, or job creation reflecting workers shifting between jobs inside the plant. Thus, our measure of job creation is a lower bound on the total amount of job creation at the plant level[7]. Of course, the same is true for job destruction.

[6] Notice the distinction between worker turnover rates and job turnover rates; see e.g. Davis and Haltiwanger (1992) for a discussion of their relationship. Unfortunately, it is not possible to compare the job turnover rates presented in this paper with worker turnover rates, as worker turnover rates are not available for Norway.

[7] Our measure of job creation is not adjusted for vacancies. It is not *a priori* possible to say whether adjustment

B. The data sources

Our primary data source is the annual census of the Norwegian manufacturing sector covering the period from 1976 to 1986[8]. This census covers, in principle, all manufacturing establishments except units where the owner is the only person employed. Consequently, there is no serious question about representativness and sampling errors in our data set, as long as the manufacturing sector is the sector of interest[9]. The unit of observation is the establishment. *Employment* is defined as the *annual average* number of people employed, including part-time workers and owners. Each establishment is identified by a number which remains unchanged until production ceases to take place at the cite. Ownership changes do not affect the identification number; only the company code associated with the plant will be altered when there is a change in ownership. This system is useful when we turn our attention to the importance of plant turnover on job creation and destruction. Other studies have been plagued by excessive counts of entries and exits, and thereby the importance of plant turnover for gross job reallocation, as they have not been able to separate ownership changes from real plant turnovers. The fact that we can identify entries and exits from year to year is clearly an advantage of these data as compared to e.g. Dunne et al. (1989).

The census data have been supplemented by a special data source which distinguish between various kinds of entries and exits[10]. This data source identifies plants which disappeared from the census because the plant size fell below the size threshold (where the owner is the only person employed in the firm), or from plants which completely closed down. Our data also provides information about plants which entered or disappeared from the manufacturing census because their activity was altered or redefined to manufacturing from non-manufacturing activity, and *vice versa.*

C. Comparability with other studies

In the following sections, we will repeatedly compare our results with studies from other countries. Clearly, such comparisons are a very interesting aspect of this research field, as they might throw some light on the large differences between OECD countries, in macroeconomic

for vacancies would lead to a higher or lower estimate of job creation.

[8]See Statistics Norway (several years), *Manufacturing Statistics*, Official Statistics of Norway NOS C 36, Statistics Norway, (Oslo), and Halvorsen et al. (1989) for details on the construction of these data sets.

[9]This statement is perhaps overly optimistic, as misreporting of the employment level in individual establishments could be a significant source of error in our analysis.

[10]Haugland (1982a, 1982b) provides documentation of this so-called Entry-Exit file.

performance in general and their unemployment records in particular. Such comparisons are, however, problematic, as the data sources and definitions from different countries are often inconsistent. Let us therefore point out some problems that should be kept in mind when we discuss our results in view of the findings from other studies. A systematic examination of the direction and magnitude of the various biases in the different studies is beyond the scope of this paper. We will just mention some of the problems which should be kept in mind: *Sample selection*: A number of studies are based on samples which are not representative for the whole population of plants. The main problem is often that plants below a certain threshold are excluded. This problem is particularly severe when the analysis focus on entry and exit, as a number of continuing plants might be counted as entrants and exiting plants as they move across the sample threshold. *Sampling interval*: Some of the studies of entry and exit have been based on censuses taken at intervals of several years. A longer sampling interval will not capture the plants/firms which turn out to be unsuccessful and close down a few years after their entry. As we show below, this is a large fraction of the entrants. *Definition of jobs*: The number of jobs in a plant has been defined as the annual average number of jobs or the number of jobs at a given date of the year. Whether owners and part time workers are included also differ between studies.

3 Basic findings on job creation and destruction

3.1 Overall job creation and destruction rates

A. Annual movements

The number of manufacturing plants in Norway have on average declined by 0.3 percent per year, while employment has declined by 1.8 percent annually, over the period 1976-86 (table A1: Background tables with more detailed information have been added in the appendix. These tables will be referred to in parentheses, as table A1 etc.). The gross numbers of entries and exits of jobs and plants by far exceeds these net numbers; see table 1, part A. In an average year, 8.4 percent of the jobs were destructed. Every year there is also significant job creation, the average number is 7.1 percent. Even in a serious recession year, such as 1982, there was a substantial creation of new jobs (5.0 percent: table A2).

The last column in table 1, part A, reveals the large magnitude of gross job reallocation taking place every year. If we consider a random manufacturing job, there is 15.5 percent probability that this job has been created during the previous year or (and) will be destructed in the coming year. This number is fairly stable across years, without any pronounced cyclical pattern.

To put this high rate of gross job reallocation into perspective, it is interesting to note that it is of similar magnitude as the gross job reallocation rates found for the manufacturing sector in Germany, France, Sweden, US (Pennsylvania) and Canada by OECD (1987), covering a similar period as we do. Baldwin et al. (1994) have found slightly higher rates of job creation and destruction in the US and Canada, using more carefully constructed data sources than did OECD. The gross job reallocation rates reported in these studies vary from 12.7 percent in (West-)Germany[11] to 20.5 percent in Canada[12].

B. Longer run movements

To what extent is the picture of high gross job reallocation a short run phenomenon? Table 1, part B, shows that between 40 and 50 percent of the jobs were reallocated within each of the periods 1976-81 and 1981-86. When we consider the whole sample period 1976-86, the gross job reallocation rate is 71 percent. More precisely, 42 percent of the jobs present in 1976 were eliminated by 1986, whereas 29 percent of the manufacturing jobs in existence in 1986 had been created within the period from 1976.

3.2 The importance of entry and exit of plants

A. Short run

Table 1, part A, shows that one fifth of the job destruction in an average year was due to plant exit. One sixth of the new jobs were created through entries. Hence, entries and exits do not constitute large parts of the job creation and destruction processes, at least in the short run. Table 1, part A, presents only the immediate job creation of new plants in the year they enter, but it is also interesting to consider the longer run impact of new entrants. This will be done next.

First, notice that Davis and Haltiwanger (1990), studying US manufacturing, find the importance of entry and exit for job creation to be slightly larger than what we have found for

[11] OECD (1987), table 4.7, Manufacturing industries.
[12] Baldwin et al. (1994, table 1).

Norway. They report that one quarter of annual job destruction was accounted for by plant exit, and that one fifth of new jobs, in an average year, were created through new entrants.

B. Long run

The numbers reported in table 1, part A, suggest that entry and exit of plants constitute a quite moderate part of job creation and job destruction. Let us now consider the impact of plant births and closures in the longer run. Table 2 shows the employment shares of new plants in the years following their entry. The table reveal that the employment share for a new cohort is fairly stable, as the cohort ages. Two opposing forces create this stability; the surviving plants expand while a number of plants exits. Both the growth rate for the survivors and the hazard rate declines when the cohort gets older, as we shall see in section 4.2 .

The employment share for declining plants is also highly stable (table A3). Once more there are two opposing forces creating this stability. The relative size declines substantially in the years before exit (table A4). What offset (but also contribute to) this decline in size is the number of new, unsuccessful entrants which provide jobs for only a few years before they exit. We will examine the process of exit and entry further when we discuss job creation and destruction broken down by the plants' age group in section 4.2 .

Table 1, part B, reveals the cumulative effect of plant entry and exit on job creation and destruction in the longer run. Almost a third (5.8 percent out of 17.8 percent) of the jobs created from 1976 to 1981 were created by new entrants in the period. The number for the subsequent period, 1981 to 1986, was slightly lower. Plant closures are even more important for job destruction for these periods. And if we consider the period 1976 to 86 as a whole, almost half of the job destruction were due to plant closures.

Entry and exit of plants clearly account for a larger part of job creation and job destruction in the longer run. The reason is that many jobs created and lost in plants in permanent operation, are temporary in nature, at least in a 5 to 10 years perspective. We will further consider the persistency of job creation and destruction in section 3.4 .

Dunne at al. (1989) found plant turnover to affect a significantly larger share of jobs in US manufacturing, than we have found for Norway. For about the same period as we consider here, they found that plant turnover accounted for the dominant share of gross job reallocation.

To summarize, plant turnover accounts for a minor part of job creation and job destruction at high frequencies, where contraction and expansion of existing plants clearly dominates. But in the longer run, plant entries and plant exits in particular, are important for the job creation and job destruction processes in Norwegian manufacturing.

3.3 Job creation among small and large plants

A. Plant size

The importance of small firms in creating jobs has received a good deal of attention in the policy debate in Norway, as in most other countries[13]. Table 3, part A, shows some evidence on job creation and destruction by plant size in Norwegian manufacturing. Considering job creation, there is a clear tendency for higher job creation *rates* for the smaller plants. But the employment share is much higher for the larger plants, so the number of jobs created are much higher for the group of the largest plants as compared to the smallest plants (table A5). The amount of job creation for plants with more than 100 employees are four times larger than for plants with less than 5 employees.

If we turn to job destruction, smaller plants also have a higher job destruction rate than larger plants. Considering both the creation and destruction rates it is evident that the amount of gross reallocation of jobs is sharply decreasing with plant size. There is net job destruction in all size categories, and the destruction rates are higher for larger plants (cf. the negative net job creation numbers in column 3 in table 3). When we also consider that the employment shares are larger for larger plants, it is clear that employment is declining most rapidly among the largest plants. In fact, almost 3 times as many jobs were lost among plants with more than 100 employees, compared to plants with 100 employees or less, even though these groups have roughly the same shares of total employment. Notice that we have measured size as the average plant size over the whole sample period. Hence, we avoid the tendency to exaggerate job losses in large plants, and job creation for small plants, inherent in studies which condition on *initial* size[14].

We will return to the issue of job creation and destruction in large versus small plants in the next section where we examine survival rates for newly created jobs. Our study has only focused on manufacturing industries, and it is widely believed that small plants are more important for

[13]See e.g. Llewellyn (1992). Davis et al. (1993) give a thought-provoking review of the debate and evidence for the US. They discuss the many pitfalls which can arise when interpreting the evidence on job creation in small versus large firms.

[14]See Davis et al. (1993) for a discussion.

job creation in the service sectors[15].

B. Firm size

Table 3, part B, presents job creation rates similar to table 3, part A, but reported by firm size rather than plant size. Table 3, part B, shows that the job creation rate for firms with less than 20 employees is twice as large as for firms with more than 50 employees, whereas the job creation rate is independent of size for firms larger than 50 employees. The job destruction rate shows a similar pattern, and consequently, so does the gross job reallocation rate. A striking result in table 3, part B, is that small firms have a positive job creation rate, while large firms do not. Employment is moving from large to smaller firms over this period. Notice once more that size is here defined as average size over the whole period, so this result is not an artifact due to the combination of noisy data and poor conditioning.

Davis et al. (1993) found that both job creation and job destruction rates declines significantly with plant and firm size in US manufacturing, as we have done for Norway. But they showed that there is no pattern in the relationship between plant or firm size and *net* job creation in the US, contrary to the monotonic, negative relationship we have found for Norway. For Norway, there is some truth in the claim that small firms are the source of new jobs in manufacturing.

3.4 Persistence of jobs created or lost

On average, 72 percent of newly created jobs survives at least one year, while 84 percent of lost jobs remain eliminated one year after they were destructed (table A6). These rates are very stable across our sampling period. The two year survival rates are only slightly smaller than the one year survival rates (table A6).

Davis and Haltiwanger (1992) report very similar results for US manufacturing; the average, one-year persistence rate for job creation in their study was 67 percent, while the one-year persistence rate for job destruction was 81 percent. We conclude that annual job creation and destruction in Norwegian manufacturing, as in US manufacturing, largely reflect persistent changes in employment rather than temporary layoff and recall policies.

In the previous section we presented some evidence which suggest that larger plants are eliminating more jobs than smaller plants. But we also pointed out that gross job reallocation

[15] See OECD (1987, 1994b) and Blanchflower and Burgess (1994) for studies of job creation in non-manufacturing sectors.

is more extensive among the smaller plants. This last point is confirmed in table 4, which shows that the one-year survival rate for a job increases strongly with plant size. However, if we focus on newly created jobs or eliminated jobs, the picture is no more turbulent for the smaller plants than for the larger. That is to say, small plants do not provide the same job security as larger plants, but small *expanding* plants offer the same job security as for jobs in larger plants. There seems to be no essential difference in the layoff policy for small and large plants.

Davis et al. (1993) provide, for US manufacturing, more clear-cut evidence that jobs provided by larger employees have a higher survival rate, independent of whether all or only newly created jobs are considered. They report, as we also find for Norwegian manufacturing, that the persistence rate for destructed jobs is no larger for smaller than larger plants in the US.

4 Confrontation with theories on job creation and destruction

4.1 The (un)importance of industry-specific shocks

Above, we have reported very high rates of gross job reallocation. Most economic models consider labour demand and the labour market as directly linked to the overall activity level in the economy and, less frequently, in terms of reallocation of jobs between industries. This section presents evidence on the importance of reallocation of jobs between plants within the same narrowly defined industries, as a share of gross job reallocation in the manufacturing sector as a whole. We will explore the usefulness of other models and theories on labour demand and job reallocation below.

A. The sectorial pattern of job creation

Table 5 shows net and gross job flows by (2-digit ISIC) industry. All industries have reduced their employment over the period 1976-86; the net, annual growth rates vary between -0.1 percent in Food manufacturing (ISIC 31) to -5.2 percent in Textiles (ISIC 32). Despite this steady decline, there is substantial job creation in all industries, varying from 3.6 percent in Metals (ISIC 37) to 8.9 percent in Metal products (ISIC 38). Column 8 shows that there is substantial gross job reallocation in all industries. The ranking of the industries in terms of gross job reallocation rates is largely consistent with the pattern for US and Canada, reported by Baldwin et al. (1994).

It is interesting to note the high, positive correlation between total job creation (the sum of job creation in expanding and new plants: column 5) and total job destruction (the sum of job destruction in contracting and closing plants: column 6) across industries; the correlation coefficient is 0.64 (std.err.=0.064). At a much more disaggregated industry level, based on 5-digit ISIC codes, the correlation coefficient between total job creation and total job destruction is 0.29 (std.err.=0.0004). At the 5-digit ISIC level, there are 142 manufacturing industries in our data set. The correlation pattern suggests that the movement of jobs from declining to expanding industries is a small part of job creation and destruction.

Next, consider the correlation between net job creation and gross job reallocation. This correlation is negligible (and negative): The correlation coefficient is -0.09 (s.e.=0.82) at the 2-digit ISIC level and -0.12 (s.e.=0.15) at the 5-digit ISIC level. Hence, net job creation is a poor indicator for the amount of adjustment in terms of gross job reallocation taking place within an industry.

What percentage of gross job reallocation is due to movements of jobs from declining industries to expanding industries? The answer will of course depend on how finely we divide the industry groups. To make the answer as favorable as possible to the orthodox view, that job creation and destruction primarily reflect industry shifts in employment, we have used the finest industry disaggregation possible with our data; the industries are identified by the 5-digit ISIC-codes. The formal expression for our decomposition procedure is presented in appendix A.

On average across years, we find that the average job creation rate is 10.0 percent in expanding industries; see table 6 (and table A7). An expanding (declining) industry is identified as an industry with net increases (decreases) in employment. The average job creation rate in declining industries is 5.0 percent. The corresponding job destruction rates are 5.8 and 10.3 percent for expanding and declining industries, respectively. That is to say, for every job created in an expanding industry, 0.6 jobs are lost. And for every job disappearing from a declining industry, 0.5 new jobs are created.

B. The importance of intra-industry job flows

To illuminate this issue further, we have disaggregated annual gross job reallocations into three components (operational definitions of this decomposition is given in appendix A):

I. Job reallocation due to *net changes* in total manufacturing employment.

II. Job reallocation required to accommodate changes in employment *between industries.*

III. Reallocation of jobs between *plants within the same industry.*

We have considered each of these components as a share of gross job reallocation (as reported in table 1). On average, 10 percent of gross job reallocation was accounted for by changes in total manufacturing employment (cf. I.). However, this share varies considerably between years, with a pronounced counter cyclical pattern (table A8). Another 21 percent of gross job reallocation in manufacturing was accounted for by changes in employment between (5-digit ISIC) industries in an average year (cf. II.). After we have considered these two components (I. and II.), we are left with 69 percent of gross job reallocation in manufacturing. That is to say, more than two thirds of job creations and destructions reflect job reallocation between plants within the same industry! Keep in mind that this share would be higher if we had applied more aggregated industry classifications.

C. Intra-industry job flows in the longer run

One might think that intra-industry job reallocation is less important in the longer run, and that industry differences in production costs, demand and technological change play a more dominating role as the time-horizon is increased. Our findings suggest to the contrary that job flows between industries are *less* important in the longer run, relative to job reallocation within industries. If we consider the period 1976-86 as a whole, only 15 percent of gross job reallocation in manufacturing was accounted for by reallocation of jobs between industries. Not surprisingly, the net job destruction in the manufacturing sector as a whole is more important in the longer run (table A9). 58 percent of gross job reallocation consisted of reallocation of jobs across plants belonging to the same industry.

4.2 Theories on plant heterogeneity

A. Three different theories

The recent empirical research on job reallocation has spurred interest in theories which captures plant heterogeneity within industries. Three basic theoretical models have been in focus. One of these models is formulated by Jovanovic (1982)[16]. This model consider new entrants as equipped with different efficiency parameters, which are unknown to the entrepreneurs at the date of entry. From the plant's performance over time, the entrepreneur updates his/her knowledge about the plant's relative efficiency. Entrepreneurs which accumulate favorable information about their relative efficiency expands, while plants with a poor performance eventually

[16]See also Lippman and Rumelt (1982) and Pakes and Ericson (1989).

decide to exit. The learning process takes time, as it is contaminated by random, idiosyncratic cost disturbances. One of the key implications of Jovanovic's model is that job destruction, as well as job creation, should be more pronounced among younger plants, while job reallocation eventually should die out as the plants get older.

Another basic model has the opposite implication; Johansen (1972) has examined a vintage model where technical efficiency is determined by the vintage of the capital (embodied technological change), and where plants must commit to a factor intensity at the date of entry (often termed "putty-clay" technology)[17]. The Johansen model identifies entry and exit within an industry by the replacement of old, inefficient plants with new, technologically more advanced plants. Younger plants should also perform better, according to the Johansen model, as their choice of technology and factor proportions are better adapted to the prevailing factor prices. To summarize, the Johansen model predicts that exit should be more common among older plants.

However, we must confess that this is a rather strict interpretation of the Johansen model. As replacement of the capital in an old plant is possible, an old plant has not necessarily old capital. In fact, Dunne (1994) has recently documented that there is very low correlation between a plant's age and its use of modern technology in US manufacturing. This should be kept in mind when we are "confronting" the Johansen model with the empirical evidence below.

The two models presented above are not necessarily antagonistic, but could be complementary. That is, exit and job destruction could be higher for both very young and very old firms, due to selection in the early years, and outdated technology in the later years. As we shall see below, this is not the pattern we find in our data.

Hopenhayn (1989), and Davis and Haltiwanger (1990) have considered models of plant growth and contraction due to idiosyncratic, random cost disturbances. Davis and Haltiwanger (1992) points out that such disturbances could reflect regional cost changes, such as changes in local taxes, transport costs, local demand or (local) energy prices. With this background, we will below also consider the importance of regional differences in job creation and destruction, as did Davis and Haltiwanger (1992).

B. Age and regional differences in job creation

Table 7 shows that there is a clear tendency for the job destruction rate to decrease as we

[17]See Førsund and Hjalmarsson (1987) for a presentation of more recent research in the tradition of Johansen's putty-clay/vintage model. Lambson (1991) has theoretically examined a model of entry and exit with a focus on putty-clay technology. Jovanovic and Lach (1989), and Jovanovic and MacDonald (1994) have examined industry evolution with a focus on embodied technical change.

consider older plants. Even more striking is the difference in the gross job reallocation rate between young and older plants. The gross job reallocation rate for one year old plants is close to 50 percent, almost four times larger than for the oldest plants. This pattern fits very nicely with Jovanovic's selection model. Johansen's vintage model, on the other hand, seems irrelevant as an explanation of plant entry and exit, and gross job reallocation within industries: Job destruction is substantially lower, not higher, among the older plants. Our finding, reported in section 3.2, that entry of new plants is a minor part of job creation, reinforces this conclusion.

A number of studies have found a similar relationship between plant age and job creation and destruction rates; see e.g. Dunne et al. (1989) and Davis and Haltiwanger (1992) and the references cited there[18].

Notice that the total job creation rates levels out as the plant gets older at a level substantially above zero, which is not consistent with (a strict interpretation of) Jovanovic's model. Clearly, there is more to plant and firm heterogeneity than captured by his model.

There is one more number in table 7 which deserves attention; 86.1 percent of total manufacturing employment belongs to plant which are more than 14 years old. While most of the *changes* in employment take place among the younger plants, a great majority of manufacturing jobs are located in old plants.

Finally, we have examined the importance of regional reallocation of jobs. The plants have been allocated into five different regions: Northern Norway; Trøndelag; the West Coast; East and Central Norway[19]; and South[20]. On average, only 1.9 percent of gross job reallocation is due to movements of jobs between these five regions. If we brake down the plants by region in interaction with (5 digit ISIC) industry, the larger part of gross job reallocation is still unaccounted for (table A10). In short, reallocation of jobs between the (large) regions considered here constitutes a small fraction of gross job reallocation.

5 Summary and final comments

Many facts about job creation have been put forward above; let us summarize some of the main findings:

[18] Wedervang (1965, ch. 7C) pointed out the negative relationship between the exit rate of plants and their age 30 years ago, studying Norwegian manufacturing plants from 1930 to 1948.

[19] Østfold, Akershus, Oslo, Hedemark, Oppland, Buskerud, Vestfold and Telemark.

[20] Agder and Rogaland.

- Job creation and destruction rates are substantial, reflecting a large amount of heterogeneity at the plant level even within narrow industry groups. These large amounts of heterogeneity have been shown to prevail both in the long and in the short run. We have documented that job creation and destruction to a large extent reflect persistent employment changes at the plant level, and not only temporary layoff and recall policies.
- Entry and exit are important for job creation and destruction in the long run, but constitute small parts of annual gross job reallocation.
- Job creation rates, but also job destruction rates, are substantially higher for small plants than for larger plants. Net job destruction is more prevalent among larger plants.
- Small firms, with less than 20 employees, have created additional jobs in the sample period, while the larger firms have, on average, reduced their employment.
- Industry specific shocks account for a small share of gross job reallocation.
- Among the theories of plant heterogeneity considered, we find that Jovanovic (1982) selection hypothesis receives strong support, while the vintage hypothesis, as put forward by Johansen (1972) a.o., seems largely irrelevant as an explanation for plant entry and exit and job reallocation.

The results presented in this paper, and in similar studies for other countries, raise some questions about the point of departure in standard macroeconomic analysis[21]. In particular, the representative firm/plant seems to be largely a misleading point of departure for thinking about aggregate labour demand and unemployment issues. Non-representative agent models seem essential to understand *aggregate* employment dynamics[22], and econometric studies of firm behavior based on aggregate (industry-level) data seem inadequate for structural analysis.

For example, labour demand models estimated on aggregate data often incorporate long lags which are claimed to represent adjustment costs. Structural interpretations of the lag coefficients are often put forward, based on the notion of a representative firm. However, with the lack of correlation between net and gross job reallocation rates, as we and others have documented, such interpretations seem to be highly questionable.

[21] See also Davis and Haltiwanger (1990) with comments for a discussion.
[22] See Caballero et al. (1994) and references cited there.

Our results, in conjunction with related studies, suggest that labor market performance is the outcome of a larger set of opposing forces than the macro data indicate. There is much more job reallocation going on than required to accommodate the net changes in (manufacturing) employment. This finding suggests that e.g. frictions in the labour market and matching issues might be important explanations of the differences in the unemployment rate between countries and over time. With the large amount of job turnover found in Norway and other OECD countries, small differences in frictions will tend to create large differences in unemployment.

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Appendix A: Formal definitions

A.1 Job creation rates etc.:

Let

$$\Delta N_{it}^{+} \equiv \begin{cases} 0 & : \quad N_{it} \leq N_{i,t-1} \\ N_{it} - N_{i,t-1} & : \quad \text{otherwise} \end{cases}$$

N_{it} = Average employment in plant "i" in year "t". See section 2.B .

and

$$N_t = \left(\sum_{i \in \Omega_t} N_{it} + \sum_{j \in \Omega_{t-1}} N_{j,t-1} \right) /2$$

where Ω_t is the set of all manufacturing plants in year t. The **total job creation rate,** θ_t^{JC}, is defined as:

$$\theta_t^{JC} \equiv \frac{\sum_{i \in \Omega_t} \Delta N_{it}^{+}}{N_t} \tag{1}$$

The total job creation rate can be divided into two parts:

- **Plant births** – summing only over new entrants in the numerator in (1) (i.e. replace the set Ω_t by the set of entrants; Ω_t^{entr}, in the summation in the numerator).
- **Plant expansion** – summing over expanding plants in the numerator in (1) (i.e. replace the set Ω_t by the set of continuing and expanding plants; Ω_t^{exp}, in the summation in the numerator).

The **total job destruction rate,** θ_t^{JD}, is defined correspondingly:

$$\theta_t^{JD} \equiv \frac{\sum_{i \in \Omega_t} \Delta N_{it}^{-}}{N_t} \tag{2}$$

where

$$\Delta N_{it}^{-} \equiv \begin{cases} N_{i,t-1} - N_{it} & : \quad N_{it} \leq N_{i,t-1} \\ 0 & : \quad \text{otherwise} \end{cases}$$

The total job destruction rate can also be divided into two parts:

- **Plant closing** – summing only over exiting plants in the numerator in (2) (i.e. replace the set Ω_t by the set of exiting plants; Ω_t^{exit}, in the summation in the numerator).

- **Plant contractions** – summing only over contracting plants, remaining in operation, in the numerator in (2) (i.e. replace the set Ω_t by the set of continuing and contracting plants; Ω_t^{cntr}, in the summation in the numerator).

The **gross job reallocation rate**, θ_t^{GJR}, is defined as:

$$\theta_t^{GJR} \equiv \theta_t^{JC} + \theta_t^{JD} \tag{3}$$

The **net job creation rate**, θ_t^{NJC}, is defined as:

$$\theta_t^{NJC} \equiv \theta_t^{JC} - \theta_t^{JD} \tag{4}$$

The four rates defined above (the job creation rate, the job destruction rate, the gross job reallocation rate, and the net job creation rate) can also be defined for a subset of manufacturing plants such as an industry, by restricting all summations above to the set of manufacturing plants belonging to, say, industry I: $\Omega_{It} \subset \Omega_t, \quad I \in \Gamma$, where Γ is the set of all industries. The industry specific rates will be referred to with an additional subscript I, such as θ_{It}^{JC} etc.

A.2 Decomposing job creation:

In section 4.1 we have disaggregated annual gross job reallocations into three components. These three components are:

I. Job reallocation due to *net changes* in total manufacturing employment (λ_t^I).

II. Job reallocation required to accommodate changes in employment *between industries* (λ_t^{II}).

III. Reallocation of jobs between *plants within the same industry* (λ_t^{III}).

They are formally defined as:

$$\begin{aligned} \lambda_t^I &\equiv \frac{\sum_i \Delta N_{it}^+ - \sum_j \Delta N_{jt}^-}{\sum_i \Delta N_{it}^+ + \sum_j \Delta N_{jt}^-} \\ &= \frac{\theta_t^{JC} - \theta_t^{JD}}{\theta_t^{JC} + \theta_t^{JD}}. \end{aligned} \tag{5}$$

$$\begin{aligned}
\lambda_t^{II} &\equiv \frac{\sum_{K\in\Gamma}\Delta N_{Kt}^{+}+\sum_{J\in\Gamma}\Delta N_{Jt}^{-}}{\sum_{i\in\Omega_t}\Delta N_{it}^{+}+\sum_{j\in\Omega_t}\Delta N_{jt}^{-}}-\lambda_t^{I} \\
&= \frac{\sum_{K\in\Gamma}s_{Kt}|\theta_{Kt}^{JC}-\theta_{Kt}^{JD}|}{\theta_t^{JC}+\theta_t^{JD}}-\lambda_t^{I}, \qquad (6)
\end{aligned}$$

where $s_{Kt}\equiv N_{Kt}/N_t$, i.e. the employment share of industry K. ΔN_{Kt}^{+} is the *net job creation* if industry K is expanding, and zero if it is contracting. Similarly, ΔN_{Jt}^{-} is the *net job destruction* if industry J is contracting, and zero if it is expanding.

Finally, we have

$$\begin{aligned}
\lambda_t^{III} &= 1-\lambda_t^{II}-\lambda_t^{III} \\
&= 1-\frac{\sum_{K\in\Gamma}\Delta N_{Kt}^{+}+\sum_{J\in\Gamma}\Delta N_{Jt}^{-}}{\sum_{i\in\Omega_t}\Delta N_{it}^{+}+\sum_{j\in\Omega_t}\Delta N_{jt}^{-}} \\
&= 1-\frac{\sum_{K\in\Gamma}s_{Kt}|\theta_{Kt}^{JC}-\theta_{Kt}^{JD}|}{\theta_t^{JC}+\theta_t^{JD}}. \qquad (7)
\end{aligned}$$

Similarly, total job reallocation can be decomposed into reallocations between and within other sectors such as regions, by replacing industries with regions in the formulas presented above.

Table 1: Components of job creation and destruction in the Manufacturing sector. Percentage of total manufacturing employment

Years	Plant birth (1)	Plant expansion (2)	Plant contraction (3)	Plant closing (4)	Total job creation (1+2)	Total job destruction (3+4)	Net job creation (1+2-3-4)	Total job reallocation (1+2+3+4)
A. Annual movements								
Average[1)]	1.1	6.0	6.8	1.6	7.1	8.4	-1.2	15.5
B. Longer run movements								
1976-81	5.8	12.0	13.6	8.5	17.8	22.1	-4.2	39.8
1981-86	5.8	13.4	16.5	11.0	19.2	27.5	-8.4	46.6
1976-86	11.1	17.9	21.2	20.8	29.0	42.0	-13.0	71.0

1) See table A2 for the corresponding annual numbers.

Table 2: Employment shares over time for new cohorts. Percentage of total manufacturing employment

	Year									
Cohort	77	78	79	80	81	82	83	84	85	86
77	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
78		1.5	1.5	1.8	1.6	1.6	1.6	1.7	1.6	1.7
79			1.3	1.5	1.4	1.4	1.5	1.5	1.5	1.4
80				0.7	0.8	0.9	0.9	0.9	0.9	1.1
81					1.1	1.0	0.9	0.8	0.9	0.8
82						0.7	0.7	0.7	0.7	0.7
83							1.1	1.3	1.3	1.2
84								1.3	1.3	1.4
85									1.4	1.5
86										1.4

Table 3: Rates of job creation and destruction by size, 1977-86. Percentage of employment in the size group

Size class[1)]	Total job creation	Total job destruction	Net job creation	Total job reallocation	Employment share[2)]
A. Plant size					
<5	17.2	18.0	-0.8	35.2	4.1
5-20	10.7	10.9	-0.3	21.6	13.1
20-50	7.9	8.5	-0.5	16.4	15.5
50-100	6.5	7.8	-1.3	14.3	14.6
>100	5.3	6.9	-1.7	12.2	53.1
B. Firm size					
<20	12.9	12.5	0.3	25.4	15.6
20-50	8.2	8.2	0.0	16.4	12.5
50-150	6.1	7.5	-1.4	13.6	19.2
150-500	6.0	8.1	-2.1	14.1	18.8
500-1000	5.5	6.4	-0.9	11.9	12.8
>1000	5.5	7.8	-2.3	13.3	21.1

1) Size is measured as average employment throughout the sample period.
2) Percentage of total manufacturing employment.

Table 4: Survival and persistence rates for all jobs, new jobs, and lost jobs by size, 1977-86

Size class[1)]	One year Survival rate		One-year persistence rate
	All jobs	New jobs	Lost jobs
A. Plant size			
<5	82.0	68.7	84.6
5-20	89.1	72.8	85.0
20-50	91.5	76.5	84.4
50-100	92.2	72.4	84.8
>100	93.1	72.2	83.3
B. Firm size			
<20	87.5	71.5	84.8
20-50	91.8	76.9	83.6
50-150	92.5	75.4	84.0
150-500	91.9	73.4	87.2
500-1000	93.6	71.3	84.5
>1000	92.2	69.9	83.0

1) Size is measured as average employment throughout the sample period.

Table 5: Components of job creation and destruction by industry. Percentage of employment in the industry

Industry (ISIC)	Plant birth (1)	Plant expansion (2)	Plant contraction (3)	Plant closing (4)	Total job creation (1+2)	Total job destruction (3+4)	Net job creation (1+2-3-4)	Total job reallocation (1+2+3+4)
Food (31)	0.9	6.7	5.9	1.7	7.6	7.6	-0.1	15.3
Textiles (32)	0.9	5.7	8.8	2.9	6.6	11.7	-5.2	18.3
Wood products (33)	0.9	6.1	6.9	1.8	7.0	8.7	-1.7	15.7
Paper products (34)	0.9	4.8	5.6	1.2	5.7	6.8	-0.9	12.6
Chemicals (35)	1.1	4.8	6.0	0.9	5.9	6.9	-1.1	12.7
Mineral products (36)	1.0	5.2	5.9	1.1	6.2	7.0	-0.9	13.2
Basic metals (37)	0.5	3.1	5.5	0.6	3.6	6.1	-2.6	6.3
Metal products (38)	1.5	7.4	7.9	1.9	8.9	9.8	-0.9	18.7
Miscellaneous (39)	1.9	6.4	8.0	2.0	8.3	10.0	-1.8	18.3
Total manu-facturing	1.1	6.0	6.8	1.6	7.1	8.4	-1.2	15.5

Table 6: Components of job creation and destruction in expanding and contracting industries. Percentage of employment in industry group

	Plant birth (1)	Plant expansion (2)	Plant contraction (3)	Plant closing (4)	Total job creation (1+2)	Total job destruction (3+4)	Net job creation (1+2-3-4)	Total job reallocation (1+2+3+4)
A. Expanding industries (5-digit ISIC)								
Means	1.7	8.3	4.6	1.2	10.0	5.8	4.2	15.8
B. Contracting industries (5-digit ISIC)								
Means	0.7	4.3	8.4	1.9	5.0	10.3	-5.4	15.3

Table 7: Rates of job creation and destruction by age of plant. Percentage of employment in the age group

Age	Job creation	Job destruction	Net job creation	Total job reallocation	Employment share[1)]
0	-	-	-	-	1.2
1	28.2	18.8	9.4	47.0	1.1
2	18.0	14.4	3.6	32.4	1.1
3	10.7	15.0	-4.3	25.6	1.0
4-5	11.7	11.0	0.7	22.7	2.3
6-10	9.7	11.0	-1.3	20.7	4.9
11-14	9.1	11.1	-2.0	20.1	2.5
15+	4.6	7.4	-2.8	12.0	86.1
All	7.1	8.3	-1.2	15.5	100.0

1) Percent of total manufacturing employment.

Appendix B: Additional tables with more detailed information.

Table A1: Number of plants and employment in Norwegian manufacturing 1976-86[1)]

Year	Number of plants	Employment
1976	13 618	371 335
1977	13 570	372 461
1978	13 294	366 835
1979	13 216	361 747
1980	13 273	360 315
1981	13 426	354 542
1982	12 955	342 871
1983	12 686	320 382
1984	12 822	316 623
1985	13 025	318 100
1986	13 144	318 079

1) Table A1 reports employment and the number of plants in Norwegian manufacturing 1976-86. The number in table 1 deviates slightly (by about 3 percent) from the numbers reported in *Statistics Norway (several years): Manufacturing Statistics, Official Statistics of Norway NOS C 36*. We do not include auxiliary units and plants under construction, or their employment.

Table A2: Employment changes in the Manufacturing sector by year. Percentage of total manufacturing employment

Years	Plant birth (1)	Plant expansion (2)	Plant contraction (3)	Plant closing (4)	Total job creation (1+2)	Total job destruction (3+4)	Net job creation (1+2-3-4)	Total job reallocation (1+2+3+4)
1977	0.9	6.3	5.7	1.1	7.1	6.8	0.3	14.0
1978	1.5	6.2	7.2	1.7	7.7	8.8	-1.2	16.5
1979	1.3	6.0	6.8	1.5	7.2	8.3	-1.1	15.6
1980	0.7	6.2	5.7	1.3	6.9	7.0	-0.1	13.9
1981	1.1	5.6	6.8	1.5	6.7	8.3	-1.6	14.9
1982	0.7	4.3	6.8	1.2	5.0	8.0	-3.0	12.9
1983	1.1	4.7	10.0	2.2	5.8	12.2	-6.4	18.0
1984	1.3	6.3	6.4	2.1	7.5	8.5	-1.0	16.0
1985	1.4	7.8	6.1	1.3	8.7	7.4	1.3	16.0
1986	1.4	7.8	6.2	2.4	9.2	8.5	0.7	17.7
Means	1.1	6.0	6.8	1.6	7.1	8.4	-1.2	15.5

Table A3: Employment shares for plants with different years of closure. Percentage of total manufacturing employment

Closure date	Year: 77	78	79	80	81	82	83	84	85	86
77	1.1									
78	1.9	1.6								
79	1.8	1.8	1.5							
80	2.0	2.0	1.9	1.3						
81	1.9	2.0	1.8	1.7	1.5					
82	1.3	1.4	1.4	1.3	1.4	1.2				
83	2.9	3.0	2.8	2.6	2.4	2.4	2.1			
84	3.2	3.2	2.9	3.0	2.8	3.0	3.0	2.1		
85	1.2	1.3	1.4	1.4	1.5	1.4	1.4	1.3	1.3	
86	2.6	2.4	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.4

Table A4: Relative size for plants with different years of closure

Closure date	Year: 77	78	79	80	81	82	83	84	85	86
77	0.25									
78	0.43	0.37								
79	0.49	0.44	0.36							
80	0.58	0.52	0.46	0.32						
81	0.67	0.62	0.53	0.46	0.38					
82	0.48	0.44	0.41	0.35	0.32	0.27				
83	0.92	0.87	0.75	0.64	0.54	0.48	0.41			
84	1.26	1.15	0.96	0.92	0.81	0.77	0.68	0.47		
85	0.50	0.48	0.48	0.46	0.45	0.39	0.35	0.39	0.29	
86	1.09	0.96	0.93	0.84	0.83	0.78	0.65	0.57	0.49	0.49

Table A5: Shares of total job creation and destruction by plant size, 1977-86. Percentage of employment in the size group

Size class[1]	Job creation	Job destruction	Employment share[2]
A. Plant size			
<5	10.1	9.0	4.1
5-20	19.8	17.3	13.1
20-50	16.9	15.4	15.1
50-100	13.5	13.8	14.6
>100	39.7	44.4	53.1
B. Firm size			
<20	27.9	23.3	15.6
20-50	14.2	12.1	12.5
50-150	16.4	17.2	19.2
150-500	15.7	18.1	18.8
500-1000	9.8	9.8	12.8
>1000	16.0	19.6	21.1

1) Size is measured as average employment throughout sample period.
2) Percentage of total manufacturing employment.

Table A6: Survival and persistence rates for job creation and destruction by year

	One year		Two years	
	Created jobs[1]	Lost jobs[1]	Created jobs[2]	Lost jobs[2]
1977	72.1	83.2	66.0	79.0
1978	76.7	83.1	69.5	78.9
1979	74.7	84.2	65.3	79.5
1980	71.5	82.4	54.3	81.3
1981	71.0	87.2	55.2	84.6
1982	62.1	85.9	59.6	79.8
1983	74.6	85.6	71.2	76.7
1984	74.5	82.8	96.6	78.9
1985	73.5	81.0	-	-
Averages	72.3	84.0	65.1	79.8

1) The numbers refer to the fraction of jobs created/lost in year t, which persist in year t+1.
2) The numbers refer to the fraction of jobs created/lost in year t, which persist in year t+2.

Table A7: Net and gross job creation and destruction rates by year. Percentage of employment in industry group

Year	Plant birth (1)	Plant expansion (2)	Plant contraction (3)	Plant closing (4)	Total job creation (1+2)	Total job destruction (3+4)	Net job creation (1+2-3-4)	Total job reallocation (1+2+3+4)
A. Expanding industries (5-digit ISIC)								
1977	1.1	7.7	4.4	0.9	8.8	5.3	3.4	14.1
1978	2.3	8.8	4.9	1.2	11.1	6.1	5.0	17.2
1979	2.2	7.7	4.3	0.9	9.9	5.2	4.8	15.0
1980	1.1	7.7	4.5	0.9	8.8	5.4	3.3	14.1
1981	2.1	8.8	4.9	1.3	10.9	6.2	4.7	17.1
1982	1.0	7.1	5.4	0.7	8.1	6.1	2.0	14.2
1983	3.2	8.2	6.1	1.7	10.5	7.8	3.7	19.1
1984	2.0	8.5	4.9	1.8	10.7	6.7	3.8	17.2
1985	1.3	8.1	4.2	1.0	10.3	5.2	4.1	14.6
1986	1.9	9.6	4.5	1.5	11.5	5.9	5.5	17.4
Means	1.7	8.3	4.6	1.2	10.0	5.8	4.2	15.
B. Contracting industries (5-digit ISIC)								
1977	0.6	4.1	7.6	1.5	4.7	9.1	-4.4	13.8
1978	0.7	4.2	0.9	2.0	4.9	11.0	-6.1	15.9
1979	0.5	4.4	9.1	2.0	4.9	11.1	-6.3	16.0
1980	0.4	4.5	7.0	1.7	4.9	8.7	-3.8	13.6
1981	0.6	4.3	7.6	1.5	4.9	9.1	-4.3	14.0
1982	0.6	3.4	7.2	1.4	4.0	8.6	-4.6	12.5
1983	0.8	4.3	10.5	2.3	5.1	12.8	-7.7	17.8
1984	0.6	4.3	7.7	2.3	4.9	10.0	-5.1	14.9
1985	1.5	6.0	9.2	1.6	7.5	10.8	-3.3	18.4
1986	0.5	4.7	9.1	3.9	5.3	13.0	-7.8	18.1
Means	0.7	4.3	8.4	1.9	5.0	10.3	-5.4	15.3

Table A8: Decomposition of annual job reallocations. Percentage of total manufacturing job reallocation

Year	Net change in manufacturing employment	Between industries	Within industries
1977	2.2	25.2	72.6
1978	7.1	26.9	66.0
1979	7.1	28.8	64.2
1980	0.2	25.0	74.4
1981	10.8	18.7	70.5
1982	23.2	7.6	69.2
1983	35.5	4.9	59.6
1984	5.9	22.3	71.8
1985	8.1	15.4	76.5
1986	4.0	31.7	64.3
Average	10.3	20.7	68.9

Table A9: Decomposition of job reallocations in the long run. Percentage of total manufacturing job reallocation

Year	Net change in manufacturing employment	Between industries	Within industries
1976-81	17.6	20.7	61.7
1981-86	24.6	12.7	62.7
1976-86	27.2	15.2	57.6

Table A10: Decomposition of job reallocations. Percentage of total manufacturing job reallocation

Year	Net change in manufacturing employment	Between regions	Within regions	Between industries/ regions	Within industries/ regions
1977	2.2	1.9	96.0	36.2	61.6
1978	7.1	1.6	91.3	38.5	54.4
1979	7.1	2.3	90.7	37.0	56.0
1980	0.2	5.2	94.2	35.4	64.0
1981	10.8	0.5	88.7	29.7	59.5
1982	23.2	0.0	76.9	19.3	57.5
1983	35.5	0.0	64.5	13.0	51.5
1984	5.9	1.7	92.4	32.2	61.9
1985	8.1	5.1	87.9	26.1	65.8
1986	4.0	1.0	94.9	39.0	57.1
Average	10.3	1.9	87.8	30.6	58.9

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