

Rethinking Deindustrialization*

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Abstract

This paper examines the decline in manufacturing in Denmark from 1994 to 2007. As in almost every other high-income country, manufacturing employment and the number of manufacturing firms in Denmark have been shrinking as a share of the total and in absolute levels. Most of the decline of manufacturing is due to firm exit and reduced employment at surviving manufacturers. However, a portion of the recorded decline is due to firms switching industries, from manufacturing to service sectors. We focus on this last group of firms, asking what they looked like before switched and how they fared after the switch. Overall this is a group of small high productivity firms that grow more rapidly after they switch. By 2007, employment at these former manufacturers equals 10 percent of manufacturing employment, reducing the apparent decline in manufacturing employment by about one half.

Keywords: deindustrialization, manufacturing firms, industry switching, employment, skill composition

JEL codes: D22, F61, L25

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1 Introduction

Common features of manufacturing sectors in the advanced industrialized world over the last several decades have included falling employment, lower shares of aggregate value-added and a substantial reduction in active firms. Denmark is no exception. Manufacturing employment peaked at 546,665 workers in 1986 and fell by over 40% over the next twenty six years, see Figure 1.¹ Similarly the number of manufacturing firms dropped in every year from 1988 to 2011. From 1980 to 2011, the share of manufacturing in value-added fell from 18 to 11 percent reflecting a similar drop in employment shares (Statistics Denmark, ed (2012)). Manufacturing in high-income countries is on the decline.

This decline is the subject of an enormous body of work offering explanations from differential productivity changes to comparative advantage and the emergence of China.² Manufacturing jobs are often considered special because of relative high wages for workers with lower levels of education and skill. Policy-makers devote enormous energy to developing proposals to stem or reverse this decline in manufacturing jobs.

In this paper we look at the change in the relative performance of the manufacturing sector from a different perspective. To be engaged in the production of a good involves a wide range of tasks from design and engineering to finance and accounting to marketing and distribution in addition to the specific act of production of the product. Firms that are considered to be manufacturers are likely performing most, if not all, of the tasks, but in particular they must be involved in the production process. Firms outside of manufacturing may, in fact, be doing every task associated with the creation of the product except the production process itself. We ask whether part of the loss of manufacturing is in fact due to the changing nature of firms and production. We try to rethink deindustrialization by focusing less on the manufacturing label assigned to the firm and focusing more on the set of activities that are associated with manufacturing activity. We focus on firms that remain in the manufacturing sector and, especially, those that switch out of manufacturing.

The basic premise of our analysis is quite simple. We ask whether firms that are leaving manufacturing for another industry are still performing many of the basic activities or tasks of manufacturing. In fact, the only change in their set of tasks may be the lack of production.

We divide our analysis into four parts. First, we consider the aggregate implications if these firms are reclassified as manufacturing. Second, we ask which firms are most likely to switch out of manufacturing and how they performed in the years leading up to their switch. Third, we examine their post-switch performance including the evolution of their employment levels and composition, their productivity and output and their engagement in international markets. Finally, we try

¹Our definition of manufacturing jobs differs from the one adopted conventionally. See section 2 for more details. The evolution is similar with any definition used.

²See e.g. the recent contributions by Pierce and Schott (2012), Bernard and Fort (2013) and Crozet and Millet (2013).

to distinguish between different types of switchers: those that have transformed themselves into traditional wholesalers, and those that have kept most of their manufacturing capabilities.

The results are dramatic. Switchers are small yet productive in the year they leave manufacturing and their post-switch performance is very strong. As a result, by the end of our sample, these former manufacturers are a sizable presence in the Danish economy. Employment at switchers equals 12.8 percent of total manufacturing employment, sales are 20.0 percent, and they have higher value-added to sales ratios. Furthermore, we can clearly identify two types of firms among our switchers: on the one hand, there are firms that have stopped any involvement in manufacturing and are conducting the traditional activities of wholesalers. On the other hand, there is a group of firms that are still involved in some manufacturing activities, but mostly focused on the design and distribution, not in production. These firms have also upgraded their workforce and employ a larger proportion of high tech workers. In sum, some of these switching firms are no longer counted as manufacturers, but they retain many of the characteristics of producers, minus the production itself.

Our work is related to several recent contributions that analyze the decline of manufacturing employment. Pierce and Schott (2012) document the “swift decline” of US manufacturing after China’s entry into WTO (see also Baily and Bosworth, 2014 for a recent overview of the decline in US manufacturing employment and prospects for the future). Bernard and Fort (2014) offer a reconsideration of this question and argue that part of this decline is masking the fact that many firms not labelled as manufacturers continue to conduct some kind of manufacturing activities, even if not the production process itself. They call these firms factoryless producers. Crozet and Millet (2014) show that French manufacturing firms have an increasing share of their revenues coming from services activities and also find an inverted U-shape relationship between “servitization” and firm’s performance. Our paper goes one step further, as it documents that the same firms transition out of manufacturing to services and also shows how their workforce composition evolves as they make the transition. We focus our analysis on the dynamics of the deindustrialization process in a small EU country.

Section 2 describes the data. Section 3 documents the aggregate evolution of the Danish manufacturing sector. Section 4 explores the changes at the firm-level before and after switching. Section 5 explains how we try to distinguish between different types of switchers. Section 6 concludes.

2 Data

Our main dataset is the IDA longitudinal database that provides detailed information about the population of Danish individuals over the period 1980-2011: gender, age, tenure, wage, occupation³, education level, etc. Workers are linked to the plant and firm where they are employed. The dataset also provides a detailed code for the economic activity of the plant. Using this information, we are

³Our detailed occupation variable (ISCO) is only available since 1991.

able to identify firms that have at least one establishment classified in a manufacturing industry activities; those with no manufacturing establishments; and, especially relevant to our analysis those firms that switch from manufacturing to non-manufacturing.⁴

One difficulty of our analysis is related to the several changes in industrial classification implemented in 1993, 2003 and 2007. The first and third reclassifications were substantial, moving from DB77 to DB93 (the Danish equivalents of the European classification NACE CLIO and NACE Rev. 1) and DB03 to DB07 (the equivalents of NACE Rev 1.1 and NACE Rev 2). The second change was less important and did not involve large modifications. Statistics Denmark made substantial efforts during these periods of industrial re-classification to properly assign firms to their main industries using both the new and old activity codes. Nevertheless, because we want to focus on real switching behavior coming from a decision of the firm, and not on a statistical re-classification, we concentrate our analysis on the period 1993-2007. All our results are robust when we extend the period of analysis to the entire period (1980-2011).

Based on this dataset, we also determine the number of workers for five different occupational categories: managers; tech workers (R&D workers and technicians); support activities; sales activities; and line workers. We further decompose line workers into two separate categories: those involved in transport and warehousing (line 1) and the others, mostly involved in the production process (line 2)⁵.

Our central dataset does not contain any information about accounting variables such as sales or value added; or about imports and exports. Therefore, we merge the IDA dataset with two other datasets: the VAT statistics dataset and the Foreign Trade dataset. Unfortunately, these two datasets only start in 1993 limiting the time coverage of our analysis to 1994-2007.

3 The Aggregate Evolution of Danish Manufacturing

The path of the Danish manufacturing sector over the last several decades is similar to the well-known path in other developed countries. Figure 1 shows the precipitous fall in the number of manufacturing firms starting in the early 1980s and continuing up to the present. Manufacturing firms can leave in one of two ways, through exit (closure of the firm) or by switching into a non-manufacturing sector. Figure 1 shows a similar pattern for employment. The drop in manufacturing employment begins later but is especially pronounced beginning in the end of the 1990s.

Table 1 documents the evolution of firms in manufacturing from 1994-2007.⁶ There is a large amount of churning of firms in the sector throughout the period. In any given year, 9-13 percent of current manufacturers shut down and a comparable but smaller number begin to produce. Net

⁴We refer to non-manufacturing industries and service industries interchangeably throughout this paper.

⁵See Appendix A for the definition of these groups based on the ISCO code.

⁶As mentioned above, data limitations restrict our detailed analysis to the period 1994-2007.

exit is positive and significant in almost every year; on average there is net exit of 1.3 percent of manufacturing firms in every year.

Industry switching, which is the focus of the remainder of our analysis, is less common but occurs consistently over time. On average in each year, 1.7 percent of manufacturing firms switch to a non-manufacturing sector and 1.1 percent of non-manufacturing firms switch to manufacturing. A firm is defined as “switching out” of manufacturing when it no longer reports any establishment in a manufacturing industry. The net switching out of manufacturing increases in the latter half of the sample, rising to an annual average of 0.8 percent of manufacturing firms. The cumulative number of firms that switch out of manufacturing from 1994-2007 is 3,158. Of those, 1,728 firms are still active in 2007.

Tables 2 and 3 report totals for firms, employment, sales, value-added, exports and imports separately for manufacturing firms and “switchers”. Switchers are defined as firms that are in manufacturing in year t but switch out of manufacturing to a non-manufacturing sector in year $t+1$ and do not re-switch back to manufacturing.

There are many more firms in manufacturing, and they account for much more employment than switchers. In addition, they dominate total sales, value-added, exports and imports. However, it is interesting to look at the evolution of these aggregate variables over time for each group. While overall manufacturing employment is declining, as noted earlier, in contrast employment at switchers is rising dramatically over the period. This rise in employment is due largely to the increasing number of switching firms, as employment per firm is relatively constant over the interval.

Aggregate sales at manufacturing firms increase 13 percent from 1994 to 2007 due to sales per firm that rise 42 percent from 33dkk million per firm in 1994 to 47dkk million in 2007. Sales at switchers are increasing much faster due to an increasing number of firms and much faster growth of sales per firm. Total value-added at manufacturing firms rises only 4.5 percent from 1994 to 2007. A decline in manufacturing firms is offset by a 31 percent increase in value-added per firm. For switchers, value-added rises at a comparable rate to sales.

Table 4 compares three groups of firms in 2007 and estimates the average difference between switchers and all manufacturing firms within industries from 1994-2007. Manufacturing firms are significantly larger in terms of employment; however, sales, sales per worker and value-added per worker are all higher at firms that switched out of manufacturing. By 2007, sales per worker are almost twice as high in switchers and value-added per worker is more than 40 percent greater.

Switchers are also different in terms of the wage and employment structure relative to manufacturing firms. The share of medium and especially high education workers is substantially higher at switchers, as is the share of white collar workers and tech workers. Perhaps unsurprisingly, wages are also higher at these switching firms (even when controlling for the composition of the workforce).

4 Switchers and Stayers

To fully understand what is happening at these firms that exit manufacturing but stay in business, we now consider a variety of dimensions of their performance. We start by examining the characteristics associated with switching itself. We then turn to post-switching performance, both the probability of survival of the firm and the evolution of firm characteristics before, during, and after the switch.

4.1 Switching Out

While we have shown that switchers are different from continuing manufacturing firms after they make the transition, we know little about the characteristics of firms that are likely to switch.

We frame the switching decision as one related to expected future profits of the firm and comparative advantage in tasks. For current manufacturing firms, the decision to switch is in large part a decision about the expected comparative advantage of the firm going forward. During the period in question, firms are facing dramatic changes in the relative cost of locating activities outside the firm and outside the country. Both onshore and offshore outsourcing are on the rise and the lower cost of communications as well as increasing global linkages present opportunities for firms to split their activities across the borders of the firm as well as across national borders.

We would expect that firms with a comparative disadvantage in production would be the most likely to incur any fixed or sunk costs of outsourcing the production process. However measuring such internal comparative disadvantage is difficult. We start by estimating a simple probit on the decision to switch. We ask whether firm characteristics such as size, productivity and trade status are systematically related to the probability of switching controlling for industry and year effects.

The results are reported in Table 5. Within the same industry, firm size as measured by log employment is negatively and significantly correlated with switching out of manufacturing. In contrast, the coefficient on the measure of firm productivity, log sales per worker, is positive and significant. Firms with multiple establishments are less likely to switch out of manufacturing, while those with larger shares of white collar wages and tech workers are more likely to make the change. Importer and exporter status are negatively correlated with switching, the share of imports and exports in total sales are significant. A greater import share and lower export share are both associated with switching.

4.2 Survival and Post-switching Performance

We now turn our attention to the relative performance of switchers versus continuing manufacturers. In Table 6, we consider the possibility that switchers are more likely to fail than non-switchers. We control for a variety of firm characteristics and examine the switch status of the firm. As is typical, survival is increasing in productivity, and employment. However, switching firms are no more likely

to exit than are continuing manufacturing firms.

In Table 7, we examine the performance of switchers around the switch date. We compare switchers to non-switchers in their manufacturing industry (pre-switch industry) as well as to non-switchers in their destination non-manufacturing industry (post-switch industry).

Two years before the industry change, future switchers are smaller in terms of sales, employment but have higher sales per worker and comparable value-added per worker compared to non-switching manufacturing firms. They already have a workforce more tilted towards white collar tech workers with higher education. Their export shares are lower while their import intensity is higher than firms that will remain in manufacturing.

The relative evolution of these switchers during and after their switch is quite dramatic. Employment levels fall in the years leading up to the switch while relative sales rise a bit and sales per worker and value-added per worker surge. The decline in employment is concentrated in lower education, blue collar workers.

Compared to firms in their destinations sectors, the switchers start with much high levels of employment and sales and lower levels of sales per worker and value-added per worker. Two years after the switch, the levels of sales per worker and value-added per worker are comparable to their peers while the switchers still retain substantial size differences. The switcher firms start the transition with lower levels of high education and white collar worker, but close these gaps during the five year period.

4.3 The Evolution of Switching firms

In this section we use detailed information on individual workers in Danish firms to examine the evolution of these switching firms around their transition dates. We consider the numbers and shares of different types of workers at switching firms before and after their exit from manufacturing. We also consider the wage profile at the switching firms relative to that at continuing manufacturers.

Figure 2 shows the evolution of the workforce at both switching firms and a control group of non-switching manufacturing firms for the 5 year period centered around the switch date. The switchers show a noticeable decline in employment in the years leading up to the switch and a small growth in employment afterwards. While both the numbers of white and blue collar workers are declining the drop is particularly pronounced for blue collar workers. After the switch, the rise in employment at switchers is concentrated in the white collar workforce. Over the entire transition period, the share of white collar workers increases from 46 to 60 percent of the workforce at switching firms. In contrast the white collar share at non-switchers increases by just one percent.

In addition to the changing composition, there is dramatic turnover in workers for switchers. All firms naturally have workers arrive and depart in any year. However, this process is much stronger at these switching firms. Two years after the switch, more than 53 percent of the workforce is new

at switchers, hired in years t through $t+2$. The comparable figure for non-switchers is under 42 percent. The pattern of educational attainment of the workforce at switchers is similar (see Figure 3). Low education and medium education workers are reduced before the switch out, and while all categories of workers increase after the transition, the growth is largest for high education workers. The share of high education workers rises from 4.4 to 9.0 percent of the workforce; at non-switching firms the share is unchanged.

Figure 4 examines the types of activities performed at switching firms from 1994 to 2007. All firms that will switch out of manufacturing are included in every year, whether or not they have already made the industry change. Overall employment declines starting with the recession in the early part of the 2000's, but the more noticeable change is in the composition of employment across function. Both types of line workers contract sharply in levels and as a share of employment at these firms. In contrast, sales and tech workers rise both in levels and shares. These firms are clearly changing their activities away from production.

5 Identifying Types of Switchers

We next try to identify whether some of these firms are still involved in some aspect of the manufacturing process even after switching industry. We adopt two different approaches to distinguish between these two types of firms. First, we look at the destination industries of switching firms. Second, we group firms by their pre-switch levels of high tech employment.

5.1 Types by destination

Figure 5 allows us to examine whether there are important differences across firms according to their destination industry. There are at least two possible types of firms that leave manufacturing. The first type transits from a set of production-based activities towards pure intermediation. These firms use their knowledge of suppliers and customers to become traditional wholesalers who match buyers and producers. A second possible category is a firm that no longer undertakes production of the goods but still is involved in design and engineering, supervision of third party production (inside or outside the country) and branding, marketing and distribution. These so-called factoryless goods producers (FGPs) have many of the same capabilities and activities as traditional manufacturing firms but no longer directly control the assembly and processing activities in-house.⁷

We do not have data on any pre-production and post-production activities at the switching firms, nor do we know whether they are engaged in hiring contract manufacturing services. Instead, we attempt to find indirect ways to distinguish between types. We start by dividing the switching firms by destination sector. We assume that firms ending up in the wholesale sector

⁷Bernard and Fort (2013) document the extent of these types of firms in the wholesale sector in the US and find that a substantial number of firms and workers are employed at FGPs.

are more likely to be closer to traditional wholesalers, the evidence of Bernard and Fort (2013) notwithstanding, while switching firms that move to Computer and R&D sectors or Other Business Activities are more likely to still be engaged in manufacturing-like activities.

Figure 5 shows big differences in the levels and shares of different functions across switching firms in these destination sectors. Firms that move to Wholesale see drops in line workers but increasing shares of sales and support staff, with little change in the share of tech workers. On the other hand, firms that move either to Computer and R&D or to Other Business Activities show large increases in the share of tech workers.

This evidence suggests that the narrative about firms that leave manufacturing includes at least two different stories. In one, the manufacturing-related capabilities are indeed declining as the firms become more like traditional wholesale firms. The other path is one of continuing activity related to manufacturing in spite of the absence of the manufacturing processes themselves.

5.2 Types by initial conditions in workforce composition

Another way to distinguish between firm types is to look at their initial stock of knowledge workers, i.e. those workers that we define as high tech. We focus on the subset of surviving switchers at the end of our period of analysis. We then define high tech firms as those firms that have a share of high tech workers above the 75th percentile two years before switching (somewhere above 8%). Those firms represent about a quarter of our sample, but they also employ about half of the workers (see Figure 6). We can also see that these firms experienced a large increase in the number and share of high tech workers.

Figure 7 shows the composition of the workforce by type of firm. We observe that high tech switchers are much larger than low tech firms. They both experience a large decline in employment the year before and during the industry change (especially getting rid of line 2 workers), but start growing again afterwards. However, for high tech firms, the share of tech workers increases (the stock remains constant) dramatically, from 19% to 27%; while sales and support activities gain in relative terms for low tech firms.

6 Conclusions

The present paper examines the set of firms that leave the manufacturing sector. These former manufacturers account for an increasing share of firms, employment, sales and value-added in the Danish economy. They represent a source of success due to their rising employment and productivity. In fact, these switching firms are likely the by-product of increasing globalization and improvements in technology. They are able to continue producing at high levels and are heavily engaged in the international economy even though they are no longer considered manufacturing firms. Further

research is needed to understand what these deindustrialized firms are doing and how they contribute to economic well-being in high income countries.

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Figure 1: Manufacturing Firms and Workers over time

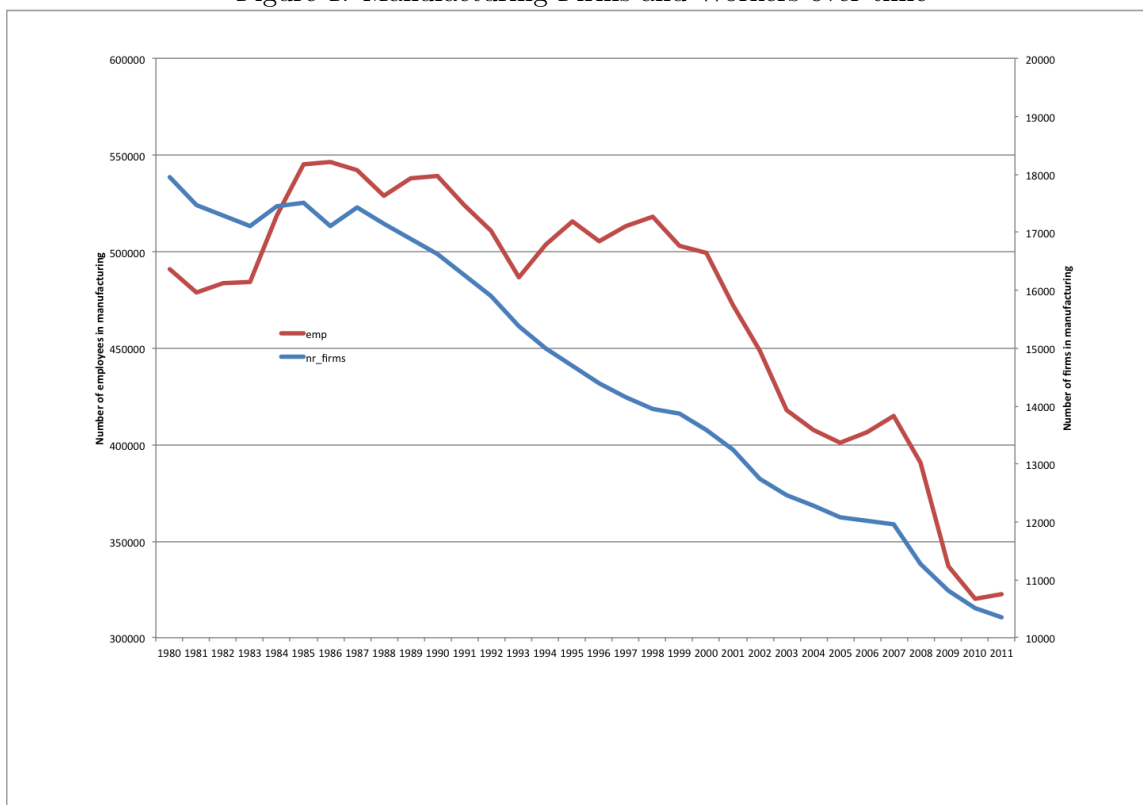


Figure 2: White and Blue Collar Workers

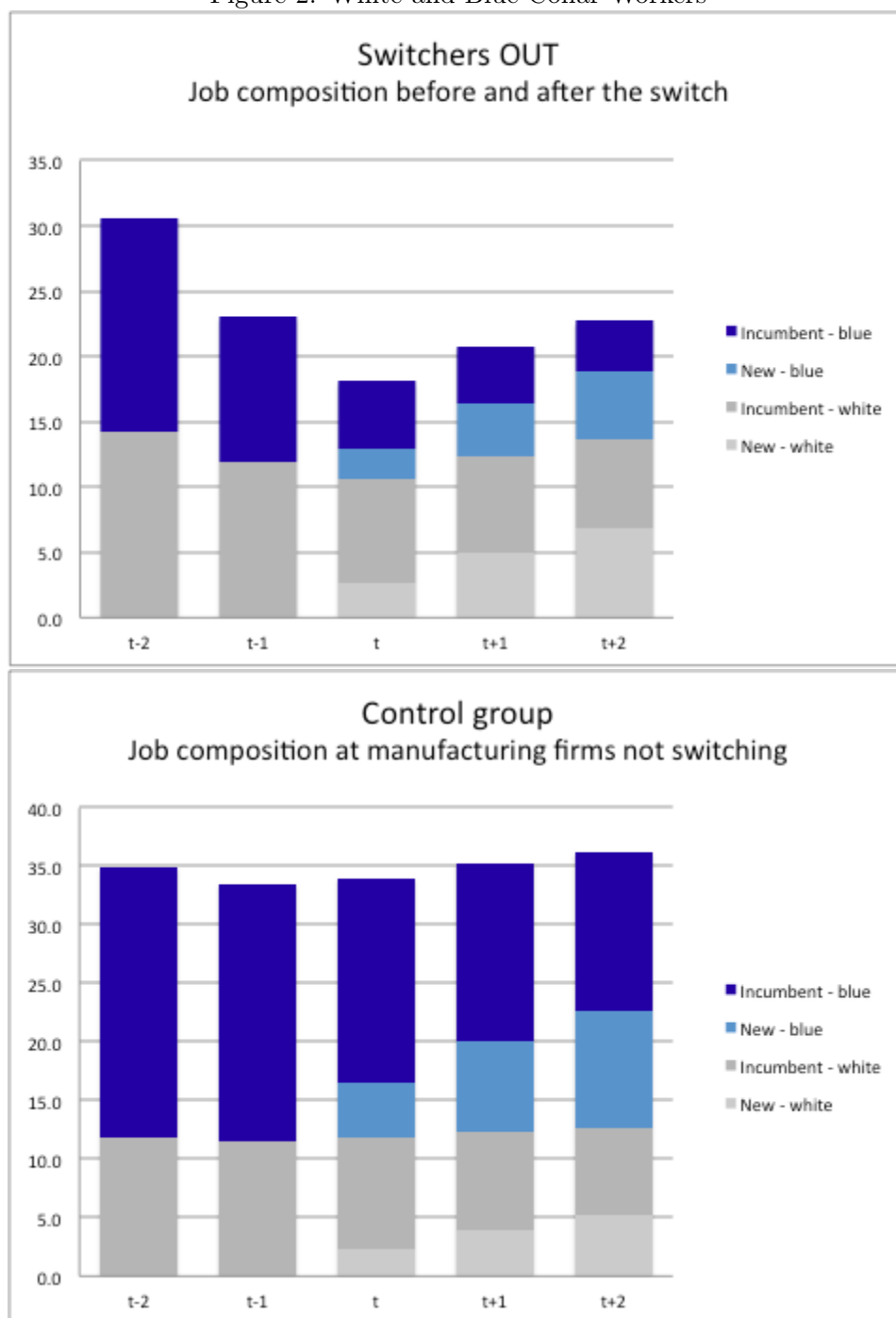


Figure 3: Education

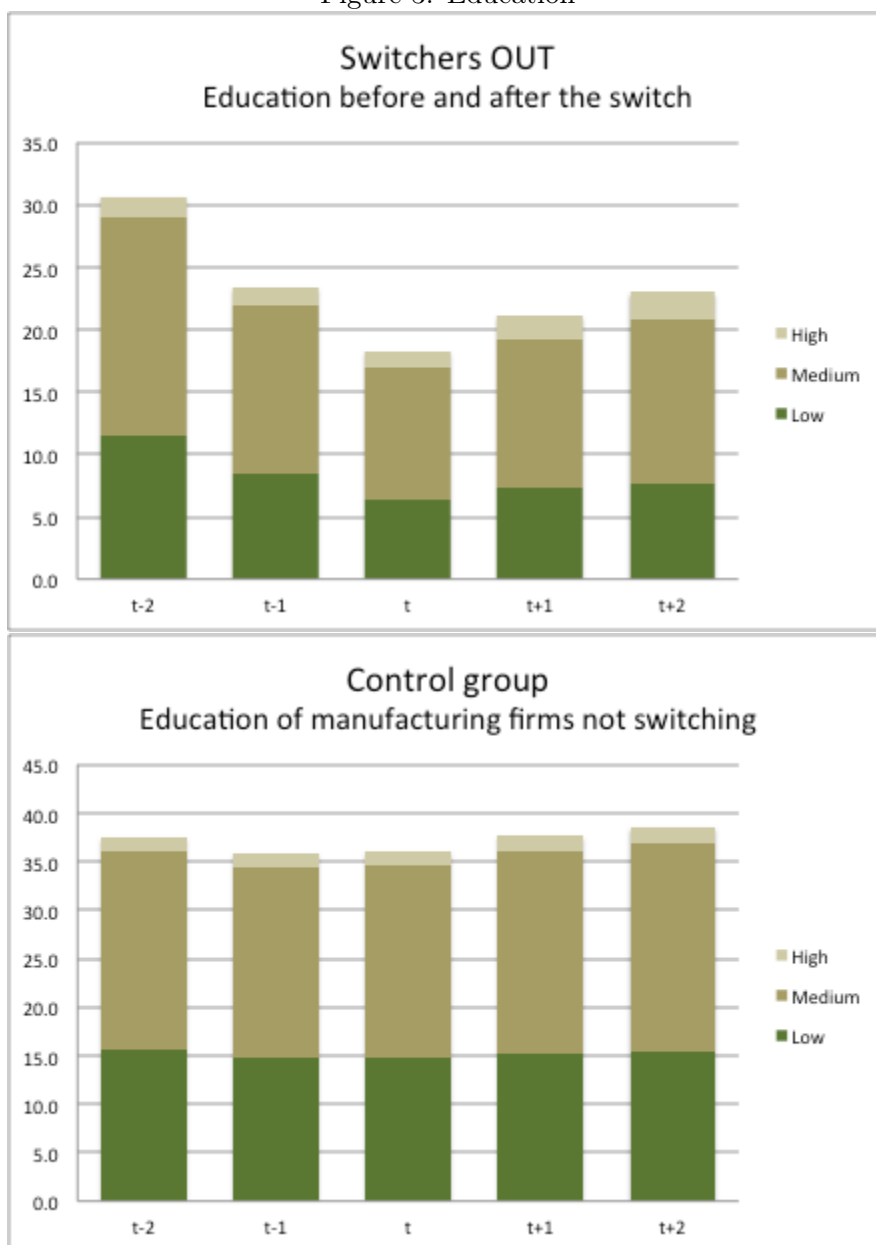


Figure 4: Workforce Composition

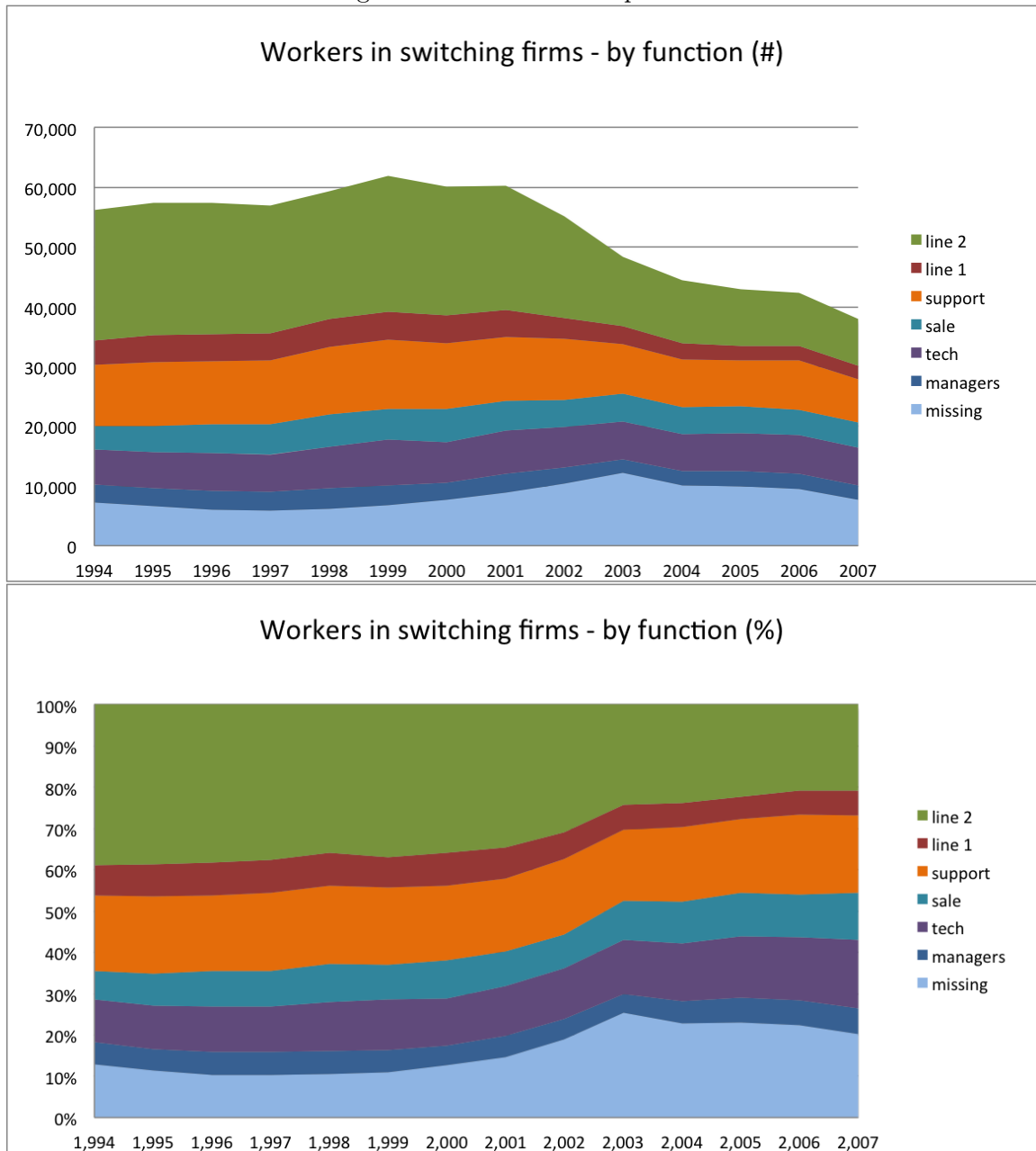


Figure 5: Workers in Switching Firms by Function

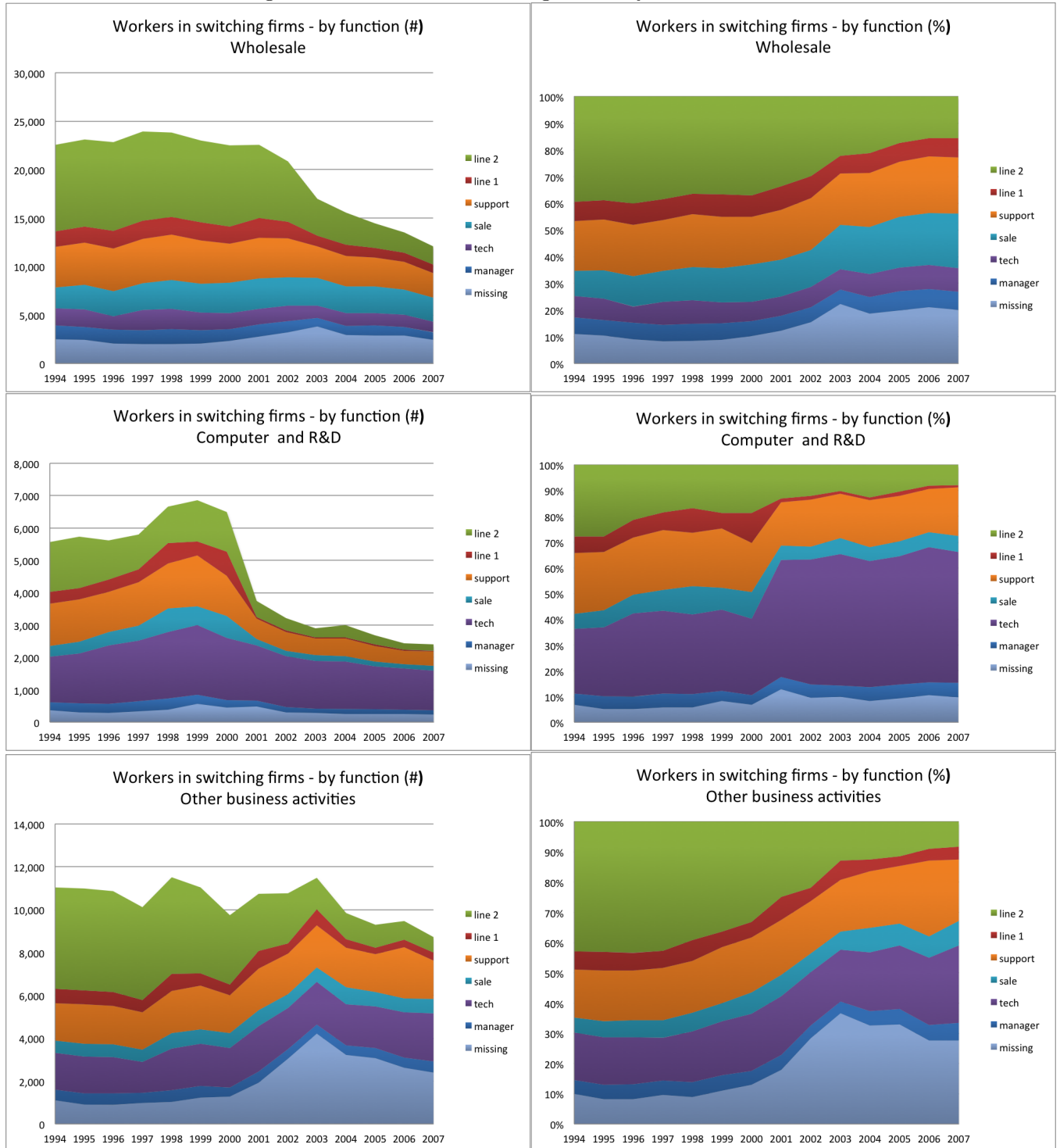


Figure 6: Evolution of the Number of Workers in Switching Firms

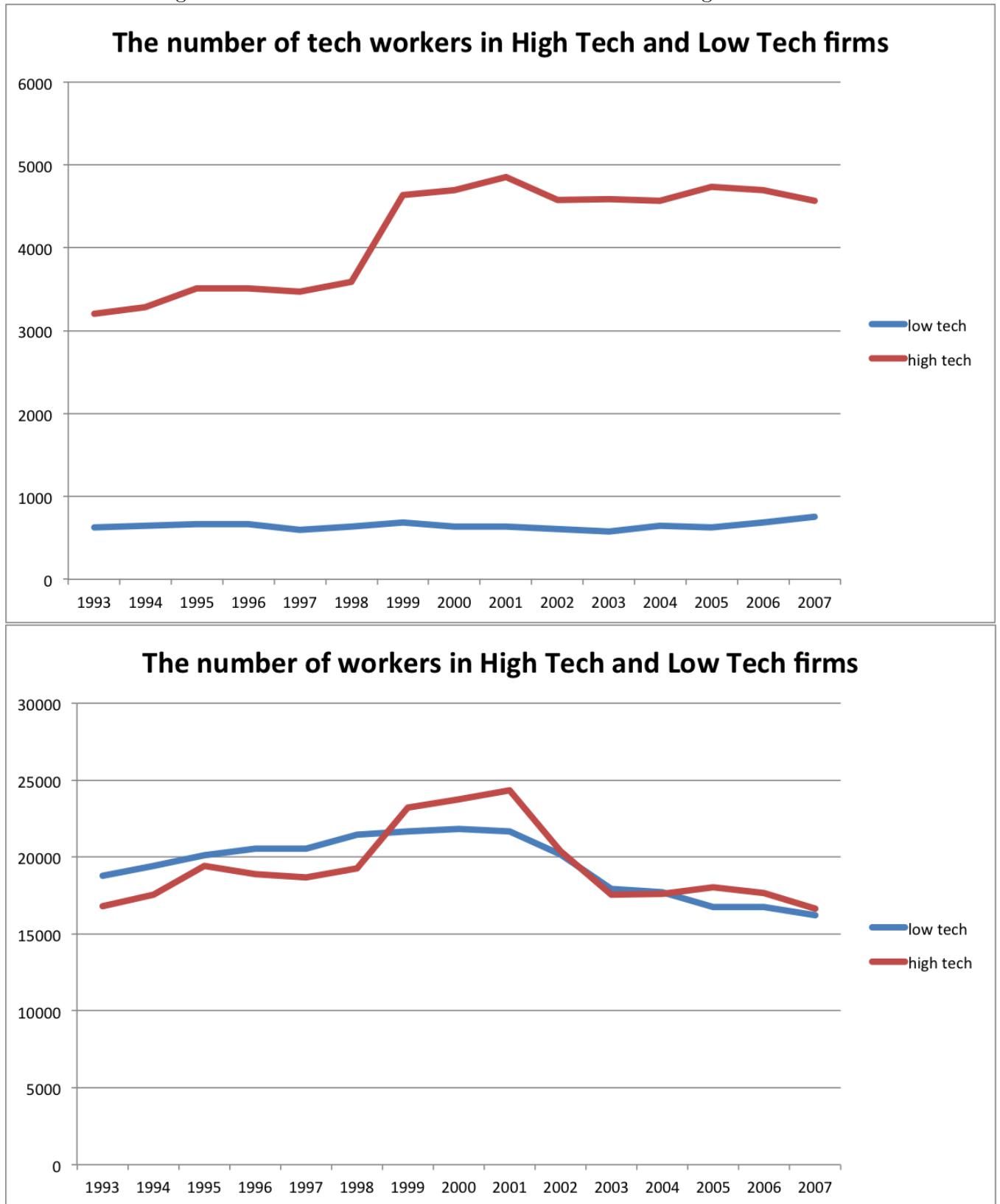


Figure 7: Evolution of the occupational composition of the workforce

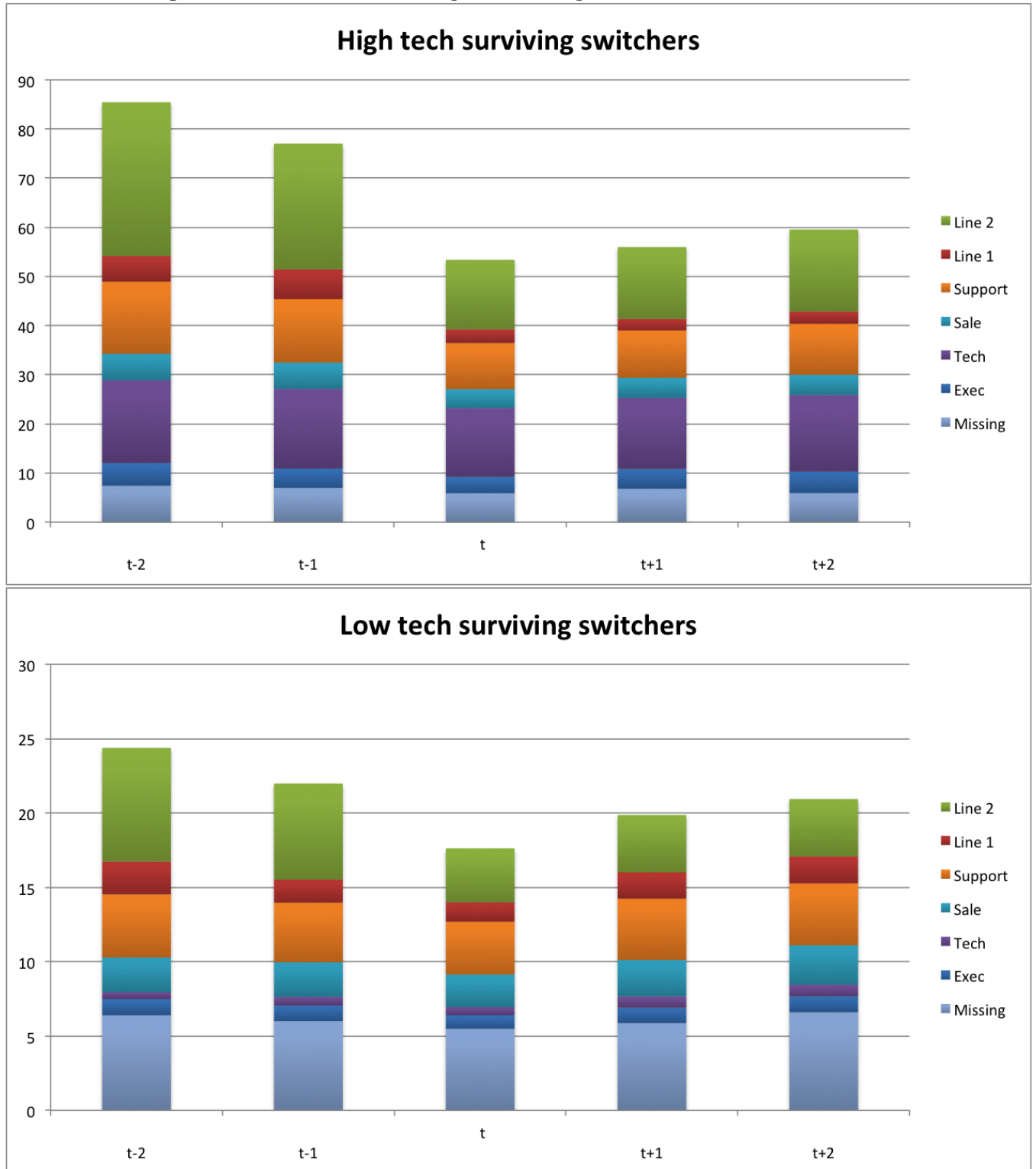


Table 1: Stayers, Switchers and Exiters in Manufacturing

Year	Entry	Stay	Switch in	Switch out	Exit	All firms
1994	1,596	13,371	206	211	1,966	15,173
1995	1,431	13,319	106	234	1,620	14,856
1996	1,272	13,066	210	259	1,531	14,548
1997	1,310	12,865	127	203	1,480	14,302
1998	1,267	12,694	146	221	1,387	14,107
1999	1,574	12,249	185	215	1,643	14,008
2000	1,307	12,274	131	180	1,554	13,712
2001	1,266	11,988	108	258	1,466	13,362
2002	1,132	11,596	124	288	1,478	12,852
2003	1,136	11,279	150	210	1,363	12,565
2004	1,181	11,094	105	186	1,285	12,380
2005	1,116	10,918	139	166	1,296	12,173
2006	1,167	10,818	111	185	1,170	12,096
2007	1,215	10,596	231	342	1,158	12,042

Note: Sales, value added, exports and imports are in millions DKK in real terms, deflated using the CPI index with baseline in 1995.

Table 2: Aggregates for All Manufacturing Firms

Year	# firms	# workers	# manufacturing workers	Sales	Value added	Exports	Imports
1994	15,173	493,801	471,462	501,075	165,648	131,085	68,496
1995	14,856	497,981	475,260	504,663	161,106	138,496	72,137
1996	14,548	488,900	464,435	497,503	170,275	144,503	72,552
1997	14,302	497,771	473,132	507,912	169,068	150,504	77,772
1998	14,107	500,014	476,146	475,304	158,892	153,709	77,119
1999	14,008	485,167	459,351	481,108	166,019	177,187	77,761
2000	13,712	481,789	459,624	498,541	166,249	207,072	92,675
2001	13,362	482,119	452,940	525,390	170,842	217,512	93,678
2002	12,852	459,036	433,328	508,837	166,105	215,533	92,745
2003	12,565	426,553	408,097	478,393	158,585	209,031	87,015
2004	12,380	411,500	392,705	488,965	160,561	210,068	87,995
2005	12,173	404,799	385,355	503,004	160,062	218,519	92,262
2006	12,096	409,766	390,895	535,783	166,112	231,061	105,552
2007	12,042	419,600	393,505	566,425	173,134	238,130	111,079

Note: Sales, value added, exports and imports are in millions DKK in real terms, deflated using the CPI index with baseline in 1995.

Table 3: Aggregates for Firms Switching Out of Manufacturing

Year	# firms	# workers	Sales	Value added	Exports	Imports
1994	211	4,113	4,774	1,401	839	775
1995	410	7,209	9,144	2,326	1,646	2,309
1996	606	11,101	13,557	3,413	2,615	3,321
1997	745	14,473	21,134	6,069	5,248	4,541
1998	897	18,720	29,177	9,952	6,086	5,886
1999	981	19,338	30,345	9,428	6,753	7,010
2000	1,042	23,733	39,012	7,848	6,833	8,241
2001	1,189	26,161	43,925	8,577	7,510	8,910
2002	1,348	28,236	50,274	8,731	12,266	13,380
2003	1,418	33,035	59,748	11,183	11,248	13,877
2004	1,485	33,465	62,495	13,192	12,334	15,057
2005	1,507	36,669	77,852	14,022	18,086	21,238
2006	1,550	38,865	82,485	14,765	14,276	19,839
2007	1,728	37,948	83,132	16,946	12,242	18,770

Sales, value added, exports and imports are in millions DKK in real terms, deflated using the CPI index with baseline in 1995.

Table 4: Characteristics of Switchers and Manufacturers

	Manufacturing	Switchers	Switcher premium
Period	2007	2007	1994-2007
Value added per worker	345,778	492,229	0.180***
Sales per worker	1,026,621	2,004,704	0.365***
Sales	47,727,100	51,316,310	0.112***
Employment	34.8	22.0	-0.302***
Education of workers (%)			
low education	36.0	30.9	-0.047***
medium education	60.0	61.0	0.013***
high education	4.0	8.1	0.034***
Share of white-collar workers (%)	36.0	63.6	0.243***
Share of tech workers (%)	7.3	12.7	0.042***
Average wage	144.0	169.2	0.118***
Wagebill share (high education)	4.4	8.8	0.036***
Wagebill share (white collar)	39.8	65.1	0.220***
Export share (%)	20.3	12.5	-0.093***
Import intensity (%)	13.0	23.1	0.083***
# products exported (HS6)	11.8	15.5	0.091***
# destinations exported to	11.1	7.6	-0.205***
# products imported (HS6)	17.2	21.0	0.134***
# destinations imported from	7.1	7.0	0.027**
Year*industry fixed effects			Y
N	12,042	1,728	203,293

Table 5: Probability of Switching Out of Manufacturing

Dep. Var.: Switching Out Probability	(1)	(2)	(3)
Log labor productivity in t-1	0.005*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Log employment in t-1	-0.003*** (0.000)	-0.003*** (0.000)	-0.001*** (0.000)
Multi-establishments firm	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
Exporter in t-1	-0.002*** (0.001)	-0.001 (0.001)	-0.002** (0.001)
Importer in t-1	0.004*** (0.001)	0.001 (0.001)	-0.002** (0.001)
Export share in t-1		-0.012*** (0.002)	-0.013*** (0.002)
Import share in t-1		0.029*** (0.002)	0.022*** (0.002)
Share of white collar worker wages t-1			0.019*** (0.001)
Share of tech workers in employment in t-1			0.003** (0.001)
Year dummies	x	x	x
Sector dummies	x	x	x
Pseudo R2	0.054	0.060	0.086
N	165,376	165,376	149,434

Note: Probit analysis, marginal effects are reported with standard errors in parentheses. We used a probit specification with year and industry (3-digit) fixed effects. Industry is defined as the lagged industry. Export (import) shares are set to 0 for firms not involved in exporting (importing). Marginal effects are reported with standard errors in parentheses. ***/**/* indicates statistical significance at the 1%/5%/10% respectively.

Table 6: Probability of Survival

Dep. Var.: Survival probability	(1)	(2)
Switcher	-0.001 (0.003)	-0.001 (0.003)
Log labor productivity _t	0.008*** (0.001)	0.008*** (0.001)
Log employment _t	0.044*** (0.001)	0.043*** (0.001)
Multi-establishment firm	-0.049*** (0.004)	-0.049*** (0.004)
Exporter _t	0.002 (0.002)	0.001 (0.002)
Importer _t	-0.006*** (0.002)	-0.008*** (0.002)
Export share _t		0.001 (0.005)
Import share _t		0.021*** (0.007)
Year dummies	x	x
Sector dummies	x	x
Pseudo R2	0.074	0.074
N	163,934	163,934

Note: Probit analysis, marginal effects are reported with standard errors in parentheses. The survival dummy is equal to 1 if the firm is active in t and $t+1$. It is equal to zero if the firm ceases to operate. Both specifications include year and industry (3-digit) fixed effects. For switchers, industry is defined as the industry prior to switching, for non switchers, it the industry in year t . Export (import) shares are set to 0 for firms not involved in exporting (importing). ***/**/* indicates statistical significance at the 1%/5%/10% respectively.

Table 7: Performance of switchers OUT before and after the switch (level analysis)

	Premium of switchers vs. manufacturing (PRE switch control group)					Premium of switchers vs. non manufacturing (POST switch control group)				
	in t-2	in t-1	in t	in t+1	in t+2	in t-2	in t-1	in t	in t+1	in t+2
Value added per worker	0.014	0.028**	0.116***	0.124***	0.117***	-0.112***	-0.085***	-0.016	0.002	-0.014
Sales per worker	0.146***	0.183***	0.315***	0.355***	0.338***	-0.137***	-0.095***	0.005	0.020	0.002
Sales	-0.186***	-0.188***	-0.160***	-0.119***	-0.123***	0.393***	0.387***	0.352***	0.358***	0.350***
Employment	-0.346***	-0.382***	-0.523***	-0.521***	-0.520***	0.554***	0.501***	0.336***	0.315***	0.314***
Education of workers (%)										
low education	-0.045***	-0.038***	-0.050***	-0.052***	-0.055***	0.016***	0.015***	0.001	0.003	-0.001
medium education	0.024***	0.012***	0.020***	0.015***	0.016***	0.011*	0.006	0.016***	0.006	0.007
high education	0.020***	0.026***	0.029***	0.038***	0.039***	-0.027***	-0.021***	-0.017***	-0.008***	-0.006*
Share of white collar workers	0.143***	0.171***	0.229***	0.259***	0.253***	-0.161***	-0.132***	-0.073***	-0.051***	-0.057***
Share of tech workers	0.026***	0.035***	0.042***	0.051***	0.050***	-0.015***	-0.007**	-0.001	0.008**	0.006
Average wage	0.083***	0.079***	0.094***	0.099***	0.093***	0.063***	0.068***	0.086***	0.084***	0.078***
Share of wages - high edu.	0.023***	0.029***	0.031***	0.039***	0.041***	-0.019***	-0.013***	-0.010***	-0.001	0.002
Share of wages - white collar	0.147***	0.172***	0.203***	0.233***	0.230***	-0.131***	-0.104***	-0.067***	-0.044***	-0.046***
Export share	-0.043***	-0.059***	-0.086***	-0.101***	-0.109***	0.118***	0.098***	0.067***	0.061***	0.056***
Import intensity	0.063***	0.067***	0.070***	0.080***	0.081***	-0.015**	-0.013**	-0.015**	-0.014*	-0.011
# products exported (6 digit)	0.145***	0.123***	0.077**	0.008	0.038	0.448***	0.425***	0.390***	0.297***	0.299***
# destinations exported to	-0.023	-0.068*	0.178***	-0.231***	-0.254***	0.590**	0.552***	0.443***	0.385***	0.354***
# products imported (6 digit)	0.111***	0.093**	0.029	0.007	0.075*	0.270***	0.281***	0.199***	0.114***	0.171***
# destinations imported from	0.036	0.010	-0.034	-0.061*	-0.039	0.316***	0.310***	0.258***	0.185***	0.216***
N	140,763	166,783	166,783	140,690	120,363	1,287,590	1,580,647	1,580,647	1,287,148	1,076,533

Note: The premium is computed using the entire panel, therefore every cell in the table is the result of a separate regression. For value added per worker, sales per worker, sales, firm size, average wage, the number of products and the number of destinations, OLS regressions are run with the log of the variable of interest on a dummy for firms switching out of manufacturing. For the various share variables, The OLS regressions are run with the shares on a dummy for switchers out of manufacturing. For importer and exporter dummy, probits are estimated on a dummy for switchers out of manufacturing. The two control groups are constructed as (1) pre-switch control group: manufacturing firms that do not experiencing any switch in the (t-2) to (t+2) window and (2) post-switch control group: non manufacturing firms that do not experiencing any switch in the (t-2) to (t+2) window. All estimations include year*industry (3 digit) fixed effects. For switchers, we use the industry prior to switching when comparing to manufacturing firms, and the industry after switching when comparing to non manufacturing firms. ***/**/* indicates significance at the 1%/5%/10% level.