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How are firms affected by the crisis and how do they react?*

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Introduction

The recession started in 2008 constitutes a massive shock to consumers and most firms. Firms were hit on their sales and finances. However, little is known on how badly they were hit and how they coped with the difficulties. This paper gives a rare and fairly early glimpse on how private Danish firms were hit and how they adjusted in order to survive the crisis. The first phase of the recession led to the largest loss of jobs since the oil crisis, in Denmark. Four years into the recession we see that larger firms are gradually creating jobs again, although the overall job growth is still negative (Statistics Denmark, 2012). Consequently we present an assessment of factors that have been important in explaining why some firms have been able to recreate jobs and others have not. Especially, we point at the role of the financial sector in creating jobs and destroying jobs.

This paper builds on a survey run on a random sample¹ of Danish firms in late 2011. A part of the survey's questions are intentionally almost identical to a survey run by ECB in 2009, although the sample in Denmark is larger and has also extra questions, on job creation and destruction, for example. Because of the close relationship with the ECB survey which covered a number of European countries except Denmark, we are able to benchmark some of the Danish results. Firms receive different macro economic and micro economic shocks all the time. The macro economic shocks come from general changes in demand while the

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¹Given that we are surveying the firms 3 years after the crisis started, a number of firms are already closed down which means that we are getting a bias because we are only surveying firms that were able to survive the initial shock of the crisis.

micro economic shocks come from other firms in the supply chain, local labour market or the production process. Each time a shock is received, the firm has to find a way to react to the different impulses. Its reactions will be constrained by overall rules, institutions and it's own flexibility with respect to contracts, employees, customers and suppliers as well as financial possibilities.

Micro economic theory predicts different responses depending on the market situation of the firm: if a firm has a decreasing demand curve for it's products and experiencing a drop in sales, theory suggests that it will firstly cut production and secondly cut costs. The first action may involve closing down production lines, laying off production workers and/or reducing staff. The second action may involve cut backs in wages, depending on the possibilities of renegotiating wage contracts. In Denmark it is reasonably easy to lay off employees because of relatively weak job protection (OECD, 2004). Among employees, it is relatively easy to lay off blue-collar workers while it is more costly to lay off salaried employees because of tenure related notice periods for salaried employees. Therefore, one should expect that firms react to a negative demand shock by laying-off workers first and later laying off salaried employees. Another possibility is to renegotiate wages. There are two options in this case. One option is to renegotiate wages that are determined by contracts with the Trade Unions, which are mostly spread among blue-collar workers. The other option is to renegotiate the wage allowances consisting of bonuses and options. In many cases, these will adjust on their own as a consequence of the lower sales. While renegotiating a contract is extremely rare, adjusting bonuses is probably more frequent. The chosen strategy will depend on the possibilities rendered by the type of contracts signed with the employees. Nevertheless, it is an empirical question that needs an empirical answer.

Yet another response to a drop in sales is, of course, to lower prices and accept a smaller margin in the short run, to compensate for the reduction of demand. This requires that the firm has enough economic strength to make this adjustment.

Firms under full competition will have a more difficult situation. They will experience an immediate price drop on the market which means that they will not be able to cover all their fixed costs. This will make those with the highest

costs to leave business relatively quickly and will allow others just to survive. Cost savings will then be their only way to survive.

Considering this, we investigate, in the first part of our paper the responses of Danish firms to the crisis and analyse the determinants of the crisis. In the second part of the paper we investigate the effects of the financial and demand problems on the growth of the firm, looking at job creation and destruction.

Literature

The Wage Dynamics Network (WDN) organized by the European Central Bank (ECB) ran a survey in 2009 in a number of E.U. countries². The purpose of that survey was to get an idea of how firms in member countries were affected and how they reacted to the challenges of the crisis.

The ECB survey has been used for a number of papers investigating different aspects of the crisis, whether to analyse the mechanisms of cost reduction adjustments to the crisis (e.g. Fabiani et al, 2011) or to analyse the price and wage adjustment mechanisms to shocks (Bertola et al 2010; Druant et al, 2010). Fabiani et al, 2011 report the intensity and nature of the initial shocks experienced by the firms and their reactions, given the different constraints of the firm and the national labour market regulations. Using country employment weighted means, it is demonstrated that there is a relationship between the GDP decline and the negative demand and credit shock. This provides a reassuring connection between the experience at the firm level and the national levels.

Similarly, Bertola et al, 2010, focus, in particular, on the impact of competition condition on the way firms are hit by the shock and on how they adjust to the crisis. Generally, they find that a significant but small proportion of the variation across countries and firms in adjustment strategies may be explained by structural and institutional features.

In the following sections, we will try to benchmark some of the Danish findings with the results of the above mentioned papers.

²Austria, Belgium, Czech Republic, Estonia, France, Italy, Luxemburg, Netherlands, Poland, Spain

The survey data

The questions in our survey have been designed to mimic as closely as possible the questions in the 2009 ECB survey. Since this is the third ECB survey run since 2007, it has a common set of background variables with the previous ones and since we do not have prior and similar information for Denmark, the comparison will have its short-comings. Part of these will be overcome by adding financial background data from Danish register data, as soon as they will be available (in a year or two).

Questions regarding the types and intensity of the crisis shocks and the types of adjustments made by the firms were added to a larger survey on wages, bonuses and other HR related issues. Therefore, it was addressed to the person responsible for personnel according to a register created by Statistics Denmark.

The sample for the survey includes:

1. All firms with more than 20 employees from the Manufacturing sector
2. Around 60% of the firms with 50 to 99 employees, from other private industries.
3. Less than 20% of firms with less than 50 employees, from each other private industry. Furthermore the percentage of firms included is decreasing with the number of employees a firm has.

This type of sampling is in line with the sampling frame used by Statistics Denmark for business statistics³.

Statistics Denmark administered the survey and sent it to 3941 firms in Nov 2011. We received responses from 1961 firms. The response rates for different size groups and industries are reported in Appendix.

The overall response rate is 49.8%. 28.4% of the selected firms were not found or did not respond while 18.5% rejected to answer the questions.

Overall, we have a population of responses of 23.6% of all firms larger than 20 employees. Due to the sampling frame, we have more responses from the Manufacturing industry, where the coverage is 49.3% for firms with more than

³ See Appendix for details on the sampling frame and the response rates.

20 employees. Our survey covers about 50% of all larger companies with more than 50 employees and a smaller proportion of the smaller firms.

Affected and by how much?

The first important question to be answered is whether the surveyed firm has been affected by the crisis or not and whether it was negatively or positively affected.

75.9% of the surveyed firms answered affirmatively to the first question. 71.5% of them have been negatively affected and only 4.4% of them state that they have been positively affected by the crisis. These percentages do not vary grossly between industries, although there are some smaller differences.

Table 1 and 2 show how firms have been affected divided by industry and size

Table 1: Percentage of firms affected by the crisis, by industry

Affected by the crisis (%)	Manufacturing	Construction	Trade	Transport	Services	Total
Affected	75.4	78.7	83.3	74.5	70.7	75.9
Negative	72.1	76.2	78.7	66.0	64.9	71.5
Positive	3.4	2.5	4.6	8.5	5.7	4.4
Not affected	23.6	19.7	16.4	24.8	26.1	22.8
Did not answer	0.9	1.6	0.3	0.7	3.2	1.3
Total	100	100	100	100	100	100
<i>Number of firms</i>	956	122	329	153	402	1962

Trade seems to be strongest affected, followed by Construction and Manufacturing. Services and Transport are the least affected industries.

The negative wave of the crisis was felt by all size groups, but slightly more by companies with 30 to 39 employees. Very few (4.9%) have enjoyed positive effects of the crisis.

Table 2: Percentage of firms affected by the crisis, by firm size

Affected by the crisis (%)	Firm size (group of employees)					Total
	20-29	30-39	40-49	50-99	100+	
Affected	74.2	78.7	75.3	76.3	75.6	75.9
Negative	70.2	75.1	72.9	71.3	70.7	71.5
Positive	4.0	3.6	2.4	4.9	4.9	4.4
Not affected	25.2	21.3	23.5	22.6	22.0	22.8
Did not answer	0.6	0.0	1.2	1.2	2.4	1.3
Total	100	100	100	100	100	100
<i>Number of firms</i>	329	225	166	607	635	1962

These results raise the question whether a set of firm characteristics are more likely to expose the firm to the crisis. Consequently, we run a logit function of being affected. The explanatory variables are firm size and industry, the competitive situation (where we distinguish between many and few competitors), if there is a contract with flexibility of hours⁴, and the general wage contract conditions of the firm. The latter is measured by the existence of a collective contract with salaried employees and blue-collar workers, respectively. Finally, this has been interacted with the indicator of flexibility, which takes the value one if there is a collective contract between firm and union and if there is, at the same time, an agreement of flexible hours over the year.

The results in Table 3 show that small firms (30-39 employees) are significantly more negatively affected by the crisis than other size groups. Trade appears to be more hit compared to Manufacturing and Construction while Services and Transport are least hit by the crisis. The competition matters as expected - firms with few competitors⁵ are the least hit. This means that the more monopolistic the market is, the less likely it is for the firm to be hit by the crisis. Hour's flexibility (most likely introduced before the crisis) has a positive impact for salaried employees, but has no impact for blue-collar workers. This is surprising since hours flexibility has been built into the majority of blue collar contracts by now but the hypothesis is that this flexibility option has not been used at all. The combined effect shows surprisingly that companies with hours flexibility and

⁴ An increasing number of firms have an agreement with workers allowing for more or less hours than the normal 37 hours as long as the average over a period of 1 year or more is 37 hours. The proportion of firms covered by such an agreement was 77% in 2008, DA, 2011.

⁵ Few competitors – dummy variable; equals 1 for firms with less than 5 competitors

collective contracts for salaried employees are more likely to be affected by the crisis.

Table 3: Probability of being negatively affected by the crisis, based on specific firm characteristics (marginal effect)

	(1)		(2)	
	Probability of being affected	Robust Standard error	Probability of being affected	Robust Standard error
Firm size (ref 20-29 employees)				
<i>30-39 employees</i>	0.09	0.05	0.10	0.05
<i>40-49 employees</i>	0.04	0.05	0.06	0.06
<i>50-99 employees</i>	0.05	0.04	0.04	0.05
<i>100+ employees</i>	0.04	0.05	-0.03	0.06
Industry (ref Transport)				
<i>Manufacturing</i>	0.12	0.05	0.14	0.09
<i>Construction</i>	0.12	0.07	0.18	0.11
<i>Trade</i>	0.22	0.06	0.21	0.10
<i>Services</i>	0.04	0.06	0.10	0.10
Few competitors	-0.07	0.03	-0.10	0.06
Bonuses for managers	0.00	0.03	0.05	0.06
Bonuses for salaried employees and workers	-0.05	0.03	-0.14	0.07
Danish Company	0.00	0.03	-0.06	0.06
Hours flexibility	-0.04	0.06	-0.13	0.09
Collective contract for Salaried workers	-0.07	0.04	-0.15	0.06
Collective contract for workers	0.07	0.05	0.10	0.07
Hours flexibility and collective contracts for salaried workers	0.13	0.06	0.10	0.11
Hours flexibility and collective contracts for workers	-0.04	0.07	-0.04	0.12

Notes: bold significant at 10%; Specification (2) shows weighted results, using employment weights

Another issue is, however, how strong the different companies are affected. Table 4 shows the answers given by the companies to this question. Such questions are always difficult to evaluate because of the subjective element and because different respondents may put different meanings to the concepts. But it seems safe to say that there are a few firms which feel only marginally affected while the majority of firms affected feel moderately to strongly affected.

Furthermore, there are also a small number of firms who say they are positively affected by the crisis.

Table 4: Intensity of the crisis, as experienced by the affected firms

Intensity of the crisis for the firms affected (%)	Negative	Positive	Total
Marginally	13.4	17.4	13.6
Moderately	48.8	50.0	48.9
Strongly	27.8	20.9	27.4
Very strongly	9.2	9.3	9.2
Did not answer	0.9	2.3	0.9
Total	100	100	100
<i>Number of firms</i>	<i>1403</i>	<i>86</i>	<i>1490</i>

A further question is where they feel mostly affected. Table 5 summarizes the results and shows that most of the affected firms have felt the reduction of demand as the largest obstacle. This does not mean that firms did not have any other problems (because the obstacles encountered are not mutually exclusive), but those were not as important as the demand reduction. For example, severe financial difficulties were experienced by less than 12% of all firms.

Table 5: Primary effects of the crisis, by type of shock experienced

Effect of the crisis	Reduction in demand	Financial difficulties	Diff. in getting customers to pay	Difficulties in supply
Not affected	70	86	87.1	94
Affected	29	11.3	11	4.1
Did not answer	1.1	2.7	1.9	1.9
Total	100	100	100	100
<i>Number of firms</i>	<i>1489</i>	<i>1489</i>	<i>1489</i>	<i>1489</i>

It is useful to see how different industries experienced these shocks. The results are reported in Table 6. It seems that Manufacturing was affected the strongest by the reduction in demand and supply while Transport had the biggest financial difficulties among all industries.

Table 6: Primary effects of the crisis by type of shock experienced and by industry. Percentages of firms affected

(%)	Manufacturing	Construction	Trade	Transport	Service	Total
Reduction in demand	31.5	22.9	27.0	27.2	27.5	29.0
Financial difficulties	13.0	11.5	7.3	15.8	8.8	11.3
Difficulties with customers	9.8	11.5	11.3	15.8	11.3	10.9
Difficulties in supply	6.7	0.0	2.9	0.0	1.8	4.1
<i>Number of firms affected</i>	<i>721</i>	<i>96</i>	<i>274</i>	<i>114</i>	<i>284</i>	<i>1489</i>

A similar table (Table 7) shows that big and small firms are affected in almost the same way. However, it is remarkable that bigger firms are less affected by financial difficulties than smaller ones, probably because they have better access to banks. Generally speaking, large firms are less affected by the named issue than smaller firms.

Table 7: Effects of the crisis by type of shock experienced and firm size

(%)	20-29 employees	30-39 employees	40-49 employees	50-99 employees	100+ employees	Total
Reduction in demand	30.3	32.2	35.2	27.2	27.3	29.0
Financial difficulties	16.0	14.7	11.2	11.2	7.7	11.3
Difficulties with customers	11.1	12.4	10.4	11.4	10.0	10.9
Difficulties in supply	4.9	6.2	5.6	3.0	3.5	4.1
<i>Number of firms affected</i>	<i>244</i>	<i>177</i>	<i>125</i>	<i>463</i>	<i>480</i>	<i>1489</i>

The analysis shows also that one shock does not come alone. It appears that many firms experience both demand and credit shocks at the same time. Table 8 compares the Danish experience with the results in the ECB survey. However, there is a common general concern that these numbers depend on the past volatility of the underlying variable, and this may differ across the sampled countries. This problem is stronger for the Danish survey because it was collected at a point of time much later into the crisis than the ECB survey. Therefore, some firms may have been able to counteract the shocks while others may have gone out of the sample of firms with more than 20 employees due to job destruction or bankruptcy. Another issue is that the Danish survey only covers firms down to 20 employees where the ECB-survey covers firms with

more than 10 employees. It should also be mentioned that the sample size of the Danish survey is bigger than the ECB survey.

With these precautions in mind, we believe it is safe to say that the demand shock in Denmark belongs to the lowest among the countries in Table 8. The same is the case for credit shocks. Another 3.96% have been affected both by demand and credit shocks. Denmark seems to experience an incidence close to Austria. When we compare Manufacturing and Trade we find that Denmark has experienced a far better situation compared to the mean European country both with respect to demand and credit shocks. However, with respect to Market services, Denmark has been hit almost at the average European level.

Table 8: Incidence of strong demand and credit shocks. Weighted by size of firm.

Country	Demand	Credit	Demand + Credit
Denmark	26.25	7.51	3.96
Austria	29.5	14.5	5.4
Belgium	43.6	18.3	13.8
Czech Republic	53.4	26.9	18.8
Estonia	80.6	39.8	34.4
Spain	40.5	27.5	19.4
France	35.6	10.3	5.6
Italy	43.9	21.1	12.6
Netherlands	38.3	20.7	10.9
Poland	22.1	15.3	7.9
Total	38.4	19.5	11.9
Euro area	32.7	19.3	11.7
Non-euro area	40.1	19.5	11.9
Manufacturing	50.4	24	16.1
Denmark Manuf	28.3	8.6	4.3
Trade	30.7	19.2	10.5
Denmark Trade	30.19	4.88	3.73
Market services	26.9	13.4	7
Denmark Services	23.56	10.43	3.96

Source: Fabiani et al, 2010, and own results, weighted by size

Responses to the crisis

The second part of the survey investigates how firms have reacted to the shocks.

The reduction in demand

Among the companies moderately or strongly affected by a reduction in demand, we asked what they have done in order to cope with the situation. The respondents could give more than one answer. The majority of firms say that they have reduced their costs compared to reduced prices, production and gross margins (profit), which were the other options. First of all, this shows that many firms are doing several things at the same time but that almost always involves lowering costs.

Table 9: Firms responses to the reduction in demand

Responses of firms (%)	Reduction in prices	Reduction in production	Reduction in gross margin	Reduction in costs
Yes	43.3	49.9	48.0	81.0
No	55.9	48.9	50.0	18.6
Did not answer	0.8	1.2	2.1	0.5
Total	100.0	100.0	100.0	100.0
<i>Number of firms affected</i>	<i>1061</i>	<i>1061</i>	<i>1061</i>	<i>1061</i>

The next question addresses how firms reduced costs. Table 10 shows that the majority of firms reduced employment. It is surprising that there are only small differences across industries. Very few companies say that they reduced wages or different types of bonus payments. It is somewhat surprising that the reduction of costs is so focused on reductions in employment and that there is so little use of the other flexibilities in wages, bonus payments and hours. It is especially surprising because the on-going decentralisation of wage bargaining in Denmark has opened up for much more flexibility with respect to these factors. However, this is not a specific Danish reaction because it has also been found for the other European countries (Fabiani et al, 2010).

Table 10: Types of cost reduction strategies, by industry

Cost reduction by reducing (%)	Manufacturing	Construction	Trade	Transport	Service	Total
The basic wage	2.0	1.6	0.0	4.0	0.5	1.5
Bonuses	1.4	7.8	0.5	4.0	1.6	1.9
Employees	58.3	51.6	59.2	52.0	63.5	58.5
Hours worked	2.6	0.0	1.5	9.3	1.1	2.4
Other reductions	35.3	37.5	38.3	30.7	33.3	35.3
Did not answer	0.4	1.6	0.5	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Number of firms affected</i>	<i>501</i>	<i>64</i>	<i>196</i>	<i>75</i>	<i>189</i>	<i>1025</i>

However, wages are not completely unaffected. Almost 40% of all firms in the survey indicate that they imposed a wage freeze and another 10% say that they will do it. The differences across industries clearly reflect the degree of foreign competition as fewer Service and Transport firms say that they have frozen wages or intend to do so.

The percentage of employees affected by the wage freeze is quite big, 75.5%, on average.

Table 11: Percentage of firms that have or will freeze wages as response to the crisis, by industry and the share of employees affected by this action

Freeze salary (%)	Manufacturing	Construction	Trade	Transport	Service	Total
No	43.9	44.3	44.9	53.9	57.0	47.5
Yes, we have	41.9	42.6	41.1	37.0	34.0	39.8
Yes, we will	11.8	9.8	11.4	9.1	6.6	10.2
Did not answer	2.7	3.3	2.3	0.0	2.4	2.4
Total	100	100	100	100	100	100
<i>Number of firms</i>	<i>956</i>	<i>122</i>	<i>329</i>	<i>153</i>	<i>402</i>	<i>1962</i>
Employees affected by salary freezing (%)	78.68	78.55	80.22	60.40	66.12	75.5

In order to investigate which factors (firm characteristics) might influence the decision of freezing the salaries of the employees, we have estimated a logit function. Results are shown in Table 12 and it seems that the smallest firms have higher chances of freezing wages, compared to the bigger firms, while the type of industry does not have a determining role. What seems to matter is the effect of the crisis on the company and whether the company has been affected by it or not. Thus, the probability of freezing wages is significantly higher for companies

that have been affected by the crisis, compared to those that declared themselves unaffected. Furthermore, it can be seen that negatively affected firms have higher probability of freezing wages than the ones positively affected by the crisis, which of course cannot surprise. The work flexibility or the type of contract does not seem to influence the wage freeze at all. Similarly, it is found that market competition has a negative impact, specifically, the probability of freezing wages decreases in monopolistic markets.

Table 12: Logit results of firm characteristics on the probability of freezing wages (marginal effects)

	Probability of freezing wages	Robust Std. Err.
Firm size (reference:20-29 employees)		
<i>30-39 employees</i>	-0.13	0.06
<i>40-49 employees</i>	-0.04	0.06
<i>50-99 employees</i>	-0.04	0.05
<i>100+ employees</i>	-0.15	0.06
Industry (reference Transport)		
<i>Manufacturing</i>	0.04	0.09
<i>Construction</i>	0.01	0.11
<i>Trade</i>	-0.01	0.10
<i>Services</i>	-0.02	0.10
Revenue	0.00	0.03
Negatively affected	0.25	0.07
Positively affected	-0.09	0.16
Few competitors	-0.12	0.05
Danish company	-0.05	0.05
Net job creation	0.00	0.00
Work flexibility	0.05	0.10
Collective contract for salaried employees	0.07	0.07
Collective contract for workers	-0.06	0.08
Work flexibility and collective contract for salaried workers	-0.07	0.11
Work flexibility and collective contract for workers	0.02	0.12
Number of observations	899	
Pseudo R2	0.09	

Notes: bold significant at 10%; weighted results, using employment weights

The role of banks and credit

Given that this crisis started out as a bank crisis, it is important to see to what extent credit constraints have dragged down firms. It appears that the shortage of funds is not one of the worst threats to the firms (only 21% of them have been affected) – again, we have to remind ourselves that firms mostly affected by the shortage of finance have probably closed down at this point in the crisis.

In our sample, the number of firms saying that they have experienced a credit constraint is relatively small, as described in Table 13. It is impossible to say if this is a small or large increase in credit constraints, since we did not observe the firms before the crisis.

Table 13: The prevalence of credit constraints among the firms experiencing financial difficulties.

Firms experiencing financial difficulties (%)	20-29 employees	30-39 employees	40-49 employees	50-99 employees	100+ employees	Total
Limited access to credit	43.0	33.3	41.7	36.4	33.9	37.0
Problems financing new projects	62.8	73.3	58.3	58.5	41.1	56.4
Large borrowing costs	36.0	31.7	27.8	30.5	25.0	30.0
<i>Number of firms affected</i>	86	60	36	118	124	424

The most important result is, however, that a number of firms do not start new projects due to funding problems. In the next section, we will examine the overall impact of these constraints on job creation and destruction.

Recent job market development

Another part of the survey investigated the number of jobs created and destroyed by each firm in 2011, within four personnel categories - top management, mid-level managers, salaried employees (white collar workers) and workers (blue collar workers).

In the first part of the following job situation within firms in Denmark and we distinguish between expanding (positive net job creation) and contracting firms (negative net job creation), looking at jobs created and destroyed in each case. In the second part of this section we analyse the impact of financial and production challenges generated by the crisis on the job creation and destruction strategies of the companies.

Job creation versus job destruction

A firm is considered to be expanding if the number of jobs created is higher than the number of jobs destroyed.⁶

$$Firm\ expanding = \begin{cases} 1, & \text{if net job creation} > 0 \\ 0, & \text{otherwise} \end{cases}$$

Following the same logic, a firm is considered to be contracting if the number of jobs destroyed exceeds the number of jobs created.

$$Firm\ contraction = \begin{cases} 1, & \text{if net job creation} < 0 \\ 0, & \text{otherwise} \end{cases}$$

Also, we consider a firm as having *zero growth* if net job creation is zero.

This distinction is important because we can have a better understanding of the “health” of the companies and a better overview of the direction of Danish economy. The expansion of a company indicates a positive evolution of the firm, a blossoming of the production generated either by an increase in the demand or by entering on a new market. The contraction of the firm indicates a restructuring of the company generated either by a reduction in demand or by the firm’s decision to leave a certain market. Financial difficulties generated by the crisis can also lead to contraction. We will further investigate these issues empirically in the second part of this section.

First, we analyse job growth for firms that are either expanding, have zero job growth or are contracting. Table 14 shows that the number of jobs created by the surveyed firms is higher than the number of jobs destroyed. However, this should not be taken as evidence that Denmark is now moving out of the crisis, but as an indication that the surveyed firms are moving in the right direction and

⁶This is in line with the typology of Lazear and Spletzer, 2011 with the difference that we look at job flows and they look at workers flows with respect to hires and separations.

are on their way out of the crisis. Nevertheless, Table 14 shows that some firms are still destroying jobs. Overall, our sample seems to have passed the trough of the crisis since job creation has been dominating destruction in 2011. Still, for the Manufacturing sector, the numbers of jobs created/destroyed reported by Statistics Denmark⁷ show a different picture, where that job destruction is dominating job creation.

The differences between official statistics and our sample may be generated by a selection bias, because our sample consists of firms with more than 20 employees and 50% of these firms are in Manufacturing. Furthermore, our sample may be biased towards the better firms because personnel managers in better companies may be more likely to respond to the survey than others, but this is probably not the main cause for the different outcomes. It is more likely that the difference is related to size of firms, where the most likely scenario is that firms with less than 20 employees are responsible for the decline in jobs. This corresponds with our finding that the smallest firms in our sample are more seriously hit by the crisis.⁸ Therefore, we will have to realize that the sampled firms are generally in a better shape than the average and smaller firm.

Table 14: Job Creation and Destruction in 2011 in expanding and contracting firms in sample (number of jobs)

Industry	Job creation		Zero growth	Job destruction		Net job creation
	Expanding	Contracting		Expanding	Contracting	
Manufacturing	7052	571	79	545	3375	3782
Construction	1179	76	12	135	328	804
Trade	2557	403	30	230	2573	187
Transport	1951	37	11	191	828	980
Services	3302	371	371	433	1854	1757
Total	16041	1458	503	1534	8958	7510

⁷ See Appendix for a better description

⁸Since the published data from Statistics Denmark is not divided in size groups we cannot confirm this hypothesis

Contracting or expanding?

As shown in the previous chapter, the financial and economic crisis has caused firms to reduce costs and most of them responded by firing employees. The dismissal of employees may represent a dismissal of the least productive or it may be a sign of restructuring the company. We will now use the same information to investigate if credit constraints or other factors are correlated with the job destruction or expansion in 2011. Using a logit function, we have estimated the probability of a company restricting or expanding its activity and correspondingly, adjusting the number of employees.

Table 15: The effects of the crisis on the decision of expanding or contraction (marginal effect)

	Contraction	Std. Err.	Expansion	Std. Err.
Large firms	0.03	0.03	0.07	0.04
Manufacturing	-0.03	0.05	-0.01	0.06
Construction	-0.10	0.07	0.08	0.08
Trade	0.09	0.06	-0.13	0.07
Services	-0.07	0.06	-0.10	0.07
Bonuses for Top and Mid Management	-0.03	0.03	0.10	0.03
Bonuses for employees	0.02	0.03	0.03	0.03
Low competition	-0.04	0.03	0.03	0.03
Flexible wages	-0.06	0.07	0.06	0.07
Collective contract for salaried workers	0.01	0.04	-0.01	0.04
Collective contract for workers	0.06	0.05	-0.14	0.06
Work flexibility and C.C for S	0.00	0.06	0.01	0.06
Work flexibility and C.C for W	0.11	0.08	-0.06	0.08
Financial difficulties	0.09	0.04	-0.06	0.04
Financial difficulties for large firms	-0.06	0.08	0.01	0.09
Demand problems	0.16	0.03	-0.13	0.04
No of observations	1115		1115	
Pseudo R2	0.05		0.06	

Notes: bold significant at 10%

We have controlled for firm size, industry, competition conditions and specific firm characteristics such as existence of a bonus system, collective contracts and flexible wages. The Large firm dummy variable equals one for firms with more than 50 employees, Bonus for employees is a dummy variable accounting for any type of bonus offered to the salaried workers and workers and Low competition

is a dummy variable equal to one for firms with less than 5 competitors. Furthermore, we have added the variables for experienced difficulties with respect to demand and financial constraints.

We analyse two different scenarios. One where we compare contracting firms with expanding and zero growth firms and one where we compare expanding firms with contracting and zero growth firms. We have also tried a multinomial logit specification with three separate outcomes. The results are not qualitatively different, but the first ones are easier to interpret.

Table 15 shows that problems with reduced demand in the beginning of the crisis will increase the likelihood of a firm to contract by 16%, even in 2011, while financial difficulties increase this chance by 9%. In the case of expanding firms, the coefficient to financial difficulties is negative but not significant, while the problems with demand will reduce the probability of a company to expand by 13%.

Moreover, large firms have higher chances of expanding than smaller firms. Firms in the Trade sector seem to have the lowest chances of expanding.

It may be argued that financial constraints are a consequence of the demand problem, as banks are more likely to reject financing in companies with demand problems. To limit this possible bias in our results, we analysed the effects of financial difficulties on firms that had no demand problems (None in Table 16), had been moderately or not affected and finally for None and affected. In order to test if financial difficulties have a specific role to play in the job creation and destruction process we have run a number of separate regressions.

Furthermore, we divided financial difficulties into the underlying three questions in the questionnaire: difficulties in getting finance for new projects, borrowing costs are too high and limitations in existing credit. The results are summarized in Table 16.

Table 16. Marginal effects of regressing job expansion and contraction on various measures of financial constraints on samples with different degrees of demand problems.

Demand problems	Contraction			Expansion		
	None	Moderate or None	Strong, Moderate or None	None	Moderate or None	Strong, Moderate or None
Overall financial difficulties	0.22	0.10	0.12	-0.05	-0.08	-0.10
<i>Std dev.</i>	0.07	0.04	0.03	0.14	0.05	0.04
Financing new projects	0.17	0.08	0.11	0.02	-0.05	-0.08
<i>Std dev.</i>	0.09	0.04	0.04	0.15	0.05	0.04
Borrowing costs are too large	0.21	0.16	0.27	-0.09	-0.18	-0.21
<i>Std dev.</i>	0.04	0.05	0.10	0.19	0.08	0.06
<i>Number of observations</i>	339	868	1115	448	868	1115

Note: Bolded coefficients are significant at 10%

Table 16 shows that firms having experienced no demand constraints (first column) have an increased probability of contraction due to financial difficulties. The next columns show that the marginal probability of contraction is also lower if they have been experiencing even moderate or strong demand problems together with financial problems.

In the case of expanding firms, the probability of expansion is reduced by the existence of financial difficulties together with problems of demand. However, our results indicate that there is no significant effect on the probability to expand for the most restricted group of firms without demand problems.

Nevertheless, there is still the possibility that the negative correlation between job contraction and financial problems is due to a generally bad economic situation of the firm which will make the bank to reject the credit application. It is, of course, hard to know which factors the bank will use for this decision. The most obvious candidates would be: total revenue, total profit (in levels or growth rates), equity or solvency of the previous year or a combination of them.. In the next section we analyse the effects of the credit constraints on firms with a positive growth in revenue, in 2011, as declared by themselves in the questionnaire. We use this proxy for good/stable economic situation of the company under the hypothesis that a firm with growing revenue is less likely to be rejected by the bank.

Table 17: Marginal effects of regressing job expansion and contraction on various measures of financial constraints on samples with different degrees of demand problems under the condition that revenue is increasing in 2011.

Demand problems	Contraction			Expansion		
	None	Moderate or None	Strong, Moderate or None	None	Moderate or Non	Strong, Moderate or None
Overall financial difficulties	0.29	0.11	0.10	-0.13	-0.08	-0.08
<i>Std dev.</i>	0.08	0.04	0.03	0.17	0.06	0.05
Financing new projects	0.32	0.11	0.11	-0.10	-0.06	-0.06
<i>Std dev.</i>	0.10	0.04	0.04	0.17	0.06	0.05
Borrowing costs are too large	0.30	0.09	0.15	-0.15	-0.17	-0.15
<i>Std dev.</i>	0.10	0.07	0.05	0.22	0.09	0.07
<i>Number of observations</i>	259	529	609	396	609	774

Table 17 shows that, although this extra limitation lowers the number of observations, it does not change the coefficients very much compared to Table 16, where we just conditioned on various levels of demand constraints. All this points to the existence of a credit crunch in Denmark, which affects even “healthy companies”. Theoretically, the question remains whether it is a causal relation from credit to growth or it is the opposite relationship. However, since our results show that the relationship is maintained for the least likely situation we believe that we have brought some evidence for a causal interpretation.

Furthermore, it is worth remarking that this result is obtained on firms that are generally doing much better with respect to job creation than the average Danish firm, suggesting even more severe financial difficulties for the average Danish company.

Summary and conclusions

This study contains analyses of a recent survey designed to investigate the evolution, experiences and reactions of Danish firms during the largest recession since the oil crisis in the 1970's. The first part of this study looked at the effects of the crisis on Danish firms, while the second part consisted of an analysis of the development of job creation and destruction in private sector firms.

The survey shows that almost all firms have been negatively affected by the crisis, although a small number of firms have benefitted from the crisis. The main way that firms have been affected has been by a decreasing demand for goods and services. The second most important way has been through a credit crunch. A large number of all firms say that the lack of financial support for new projects has constrained their growth. These results may underestimate the real effects of credit constraints and demand reductions, especially for small firms, due to the possible bias in our survey. Comparing the survey with a similar survey conducted by the European Central Bank reveals that Danish firms have been hit by the economic crisis at a similar level as Austria, which is among the least affected countries in Europe in the ECB analysis. This result may, however, be biased by the fact that we have been surveying Danish firms 2 years later into the crisis compared to the European survey. This means that a number of firms have already been closed or have reduced their employment to below 20 employees, making them non-participants in our survey.

In the second part of our study we look at the job creation and destruction behaviour of the surveyed firms in 2011. Our survey shows a more optimistic picture with a positive net creation of jobs in Danish firms whereas Statistics Denmark still shows a negative development in 2011. This difference may be caused by the possible sampling bias in our survey.

Also, we show that smaller firms have a higher probability of becoming affected by the crisis while firms in a low competitive market have less chances of being affected. Moreover, we show that financial and demand constraints trigger cost reduction that leads to a reduction of the number of employees and restructuring of the firms.

Finally, we find that firms in our sample are more likely to destroy jobs if they have credit problems. This coefficient remains significantly different from zero even when we only base our estimations on firms which did not have demand problems related to the crisis or when we restrict our estimates to companies with no demand problems and positive revenue growth in 2011. This indicates that firms, which have had no problems on the demand side and have no economic problems, are actually constrained by the credit system.

A similar negative correlation of job creation and credit problems is only found for firms that also have demand problems so it is not possible to say that a credit constraint has an independent role for job creation. Thus, for expanding firms it cannot be ruled out that banks do not constrain activities.

Given that we are investigating the large and probably better-fitted firms indicates an even larger and more serious credit problem for the smaller and less fortunate firms which already have suffered more in the crisis than the bigger firms.

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Appendix

A. Sample description

Table A1: Sampling Frame of survey; Percentage of firms sampled, by industry and number of employees

Industry	20-29 employees	30-39 employees	40-49 employees	50-99 employees	100+ employees	Total
Manufacturing	99.1	99.1	100.0	99.6	99	99.3
Construction	5.6	13.8	19.3	63.2	100	25.0
Trade	7.6	9.4	18.4	61.9	98.9	30.0
Transport	3.9	11.8	10.6	62.0	98.7	32.4
Services	6.1	8.4	14.8	60.4	98.1	36.3
<i>Total</i>	23.0	30.8	35.2	72.2	98.7	47.5

Table A2: Coverage rate of the survey, by industry and size group

Industry	20-29 employees	30-39 employees	40-49 employees	50-99 employees	100+ employees	Total
Manufacturing	45.16	51.81	53.54	50.89	49.03	49.30
Construction	3.09	4.43	11.01	29.61	45.98	11.68
Trade	3.79	4.22	10.25	30.46	47.48	14.67
Transport	2.12	7.89	6.38	35.44	48.32	17.33
Services	3.33	4.35	7.42	35.11	43.90	18.27
<i>Total</i>	10.84	15.68	18.99	37.90	46.82	23.63

Table A3: Number of responses and non-responses, by industry

Industry	Answered	Not found	Did not answer	Bankruptcy	Other reasons	Total
Manufacturing	956	485	432	24	28	1925
Construction	121	75	50	6	7	259
Trade	329	214	102	15	12	672
Transport	153	83	41	2	7	286
Services	402	261	106	18	12	799
<i>Total</i>	1961	1118	731	65	66	3941

Source: Statistics Denmark

Table A4: Number of responses and non-responses, by firm size

Firm size	Answered	Not found	Did not answer	Bankruptcy	Other reasons	Total
20-29 employees	329	161	184	13	11	698
30-39 employees	225	115	88	10	4	442
40-49 employees	166	73	61	3	5	308
50-99 employees	607	295	216	19	19	1156
100+ employees	634	474	182	20	27	1337
<i>Total</i>	1961	1118	731	65	66	3941

Source: Statistics Denmark

TableA5: Number of firms and rate of coverage for industries

Industry	All firms > 20 employees	Answered	% answered
Manufacturing	1939	956	49.3
Construction	1036	121	11.7
Trade	2242	329	14.7
Transport	883	153	17.3
Services	2200	402	18.3
<i>Total</i>	8300	1961	23.6

Source: Statistics Denmark

Table A6: Number of firms and rate of coverage for size groups

Firm size	All firms > 20 employees	Answered	% answered
20-29 employees	3035	329	10.8
30-39 employees	1435	225	15.7
40-49 employees	874	166	19.0
50-99 employees	1602	607	52.5
100+ employees	1354	634	46.8
<i>Total</i>	8300	1961	23.6

B. Job destruction in Denmark during the crisis

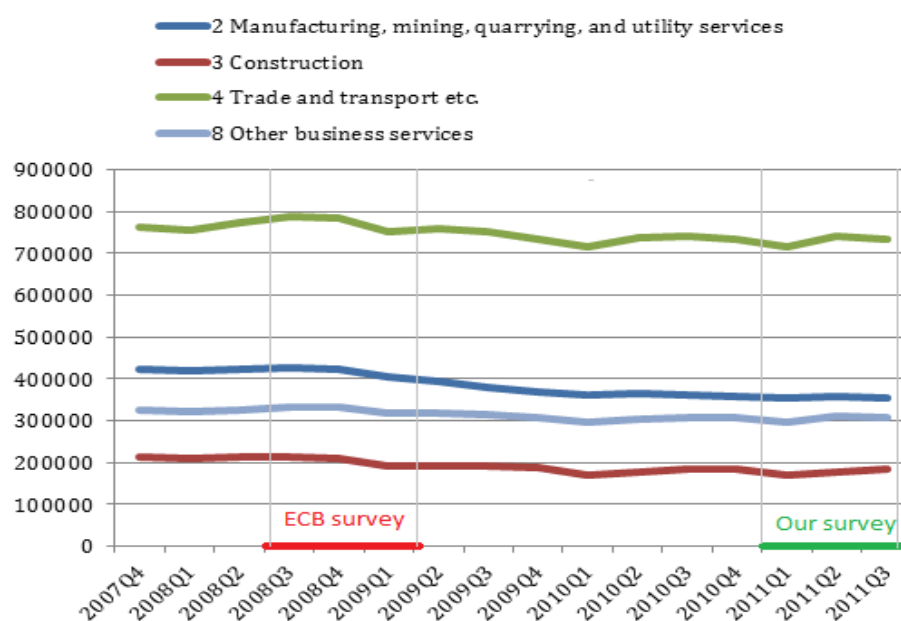
Table B1 shows that Denmark has lost almost 9% of all private sector jobs since the 3rd quarter of 2008. The largest loss was in the Manufacturing industry with 15% of all jobs. Manufacturing was most vulnerable because of a wage growth higher than in countries competing with Danish products, especially Germany, (DA, 2012). Since the ECB survey was conducted in the summer of 2009 and the Danish survey was run in Nov-Dec 2011, it is obvious that Denmark was surveyed later in the development of the crisis and this will have an impact on the answers. First of all, it means that many adjustments have been executed in the early phase of the crisis, therefore making comparisons with the ECB survey difficult. Secondly, a number of the Danish firms might have left the sample of firms surveyed because they have lost many jobs already or might have gone bankrupt at the time of our survey. Table B1 shows that $\frac{3}{4}$ of the job destruction happened in the first phase of the crisis, from the 3rd quarter of 2008 to the second quarter of 2009, when the ECB survey was conducted. Conversely, $\frac{1}{4}$ of the total destruction happened between the time of the ECB-survey and our survey. Thus, it is most likely that the firms are more influenced by the second phase of the crisis than by the first phase, when responding to the survey.

Table B1: Total job destruction in the Private sector from 2008

Job loss in	Q ₃ ²⁰⁰⁸	Overall (Q ₂ ²⁰⁰⁸ -Q ₃ ²⁰¹¹)	The first phase (Q ₂ ²⁰⁰⁸ -Q ₃ ²⁰⁰⁹)	The second phase (Q ₃ ²⁰⁰⁹ -Q ₃ ²⁰¹¹)	Impact in the First phase (%)	Impact in the Second phase (%)	Overall change (%) (Q ₃ ²⁰⁰⁸ -Q ₃ ²⁰¹¹)
Manufacturing, mining and quar.	427651	-67358	-47446	-25052	70	30	-15.8
Construction	212560	-26762	-20155	-7807	75	25	-12.6
Trade and transport etc.	787168	-48659	-36269	-15946	75	25	-6.2
Information and communication	115620	-6515	-3709	-2128	57	43	-5.6
Financial and insurance	96028	-7433	-5484	-2707	74	26	-7.7
Real estate	64140	-1023	-4418	1566	432	-332	-1.6
Other business services	332871	-23829	-18248	-6795	77	23	-7.2
Total	2036038	-181579	-135729	-58869	75	25	-8.9

Figure B1 shows the evolution of jobs in Denmark in the past 5 years and the differences between the effects captured by our survey and the ECB survey.

Figure A1. Evolution of jobs in main private industries, 2007-2011



C. The Questionnaire

Questions on the reaction to the current economic downturn

1 - To what extent is your firm's activity (in terms of turnover) affected by the current economic and financial crisis?

Please choose a single option

- Negatively affected (please specify)
 not at all
 marginally
 moderately
 strongly
 exceptionally strongly
 Positively affected
 Not at all

2 - To what extent is the current economic and financial crisis affecting your firm with respect to each of the following aspects? Please choose an option for each line

	<i>not at all</i>	<i>marginally</i>	<i>moderately</i>	<i>strongly</i>	<i>exceptionally strongly</i>
Fall in the demand for your firm's products/services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in financing your firm's activity through the usual financial channels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in being paid by customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in obtaining intermediate products from your firm's usual suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 - If the current economic and financial crisis is causing a fall in the demand for your firm's products/services, to which degree has your company adopted each of these strategies to face such a fall?

Please choose an option for each line

	<i>To a high degree</i>	<i>To some degree</i>	<i>To a low degree</i>	<i>Not at all</i>
Reduce prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce margins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4 - If the reduction of costs is of any relevance in your answer to question 3, please indicate the main channel through which this goal is achieved in your firm.

Please choose a single option, the most important factor

- Reduce base wages
 Reduce flexible wage components (for example bonuses, benefits, etc.)
 Reduce the number of permanent employees
 Adjust the number of hours worked per employee
 Reduce other costs

5 - In the current economic and financial crisis, has your firm (or is it going to) frozen the base wage of some employees?

Freeze in base wage: base wage in nominal terms is unchanged from one pay negotiation to the next. The last two options are not mutually exclusive

- No
 Yes we froze the nominal base wage
 For what percentage of employees _____%
 Yes we are going to freeze the nominal base wage

6 - In the current economic and financial crisis, has your firm (or is it going to) cut the base wage of some employees?

*Cut in base wage: base wage in nominal terms is decreased from one pay negotiation to the next
The last two options are not mutually exclusive*

- No
- Yes we froze the nominal base wage
- For what percentage of employees _____%
- Yes we are going to freeze the nominal base wage

7 - If the current economic situation is causing financial difficulties for your firm, please indicate the reason for this happened:

The options are not mutually exclusive

- The bank has limited an existing credit
- The bank is unwilling to expand current credit line
- Borrowing costs have become too high

Questions on other economic factors

8 - Does your firm have any of the following bonus systems for each of the following employees groups?

	<i>Individual bonuses</i>	<i>Team bonuses</i>	<i>Stocks or warrants</i>	<i>Equities Employee shares</i>	<i>Profit shares</i>	<i>Qualification based wages</i>
Top-management personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mid-level management personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Salaried employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9 - Does your firm have any of the following characteristics:

- Is covered by a collective agreement for monthly paid (salaried) employees Yes/No
- Is covered by a collective agreement for hourly paid employees (workers) Yes/No
- Has a collective contract that makes it possible to work flexible hours without overtime pay Yes/No
- For salaried employees Yes/No
- For workers Yes/No
- The firm is a subsidiary of a firm abroad Yes/No
- The firm is a parent company for one or more companies abroad Yes/No
- The firm has created jobs in 2011 Yes/No
- The firm has destroyed jobs in 2011 Yes/No

10 - How many competitors does your firm have in the market of your core business? (0...1000)

11 - How big is the increase in turnover in 2011 compared to 2010? (percentages)

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