33/13
Working Paper

Innovation, human capital and exogenous shocks

Eirik S. Knudsen
Lasse B. Lien

SNF
Et selskap i NHH-miljøet
SAMFUNNS- OG NÆRINGSLIVSFORSKNING AS
Institute for Research in Economics and Business Administration

SNF
Samfunns- og næringslivsforskning AS

- er et selskap i NHH-miljøet med oppgave å initiere, organisere og utføre eksternfinansiert forskning. Norges Handelshøyskole og Stiftelsen SNF er aksjonærer. Virksomheten drives med basis i egen stab og fagmiljøene ved NHH.

SNF er ett av Norges ledende forskningsmiljø innen anvendt økonomisk-administrativ forskning, og har gode samarbeidsrelasjoner til andre forskningsmiljøer i Norge og utlandet. SNF utfører forskning og forskningsbaserte utredninger for sentrale beslutningstakere i privat og offentlig sektor. Forskningen organiseres i programmer og prosjekter av langsiktig og mer kortsiktig karakter. Alle publikasjoner er offentlig tilgjengelig.

SNF
Institute for Research in Economics and Business Administration

- is a company within the NHH group. Its objective is to initiate, organize and conduct externally financed research. The company shareholders are the Norwegian School of Economics (NHH) and the SNF Foundation. Research is carried out by SNF´s own staff as well as faculty members at NHH.

SNF is one of Norway´s leading research environment within applied economic administrative research. It has excellent working relations with other research environments in Norway as well as abroad. SNF conducts research and prepares research-based reports for major decision-makers both in the private and the public sector. Research is organized in programmes and projects on a long-term as well as a short-term basis. All our publications are publicly available.

Working Paper No 33/13

Innovation, Human Capital and Exogenous Shocks

by

Eirik S. Knudsen

Lasse B. Lien

SNF project no 1306 "Crisis, Restructuring and Growth"

CRISIS, RESTRUCTURING AND GROWTH

This working paper is one of a series of papers and reports published by the Institute for Research in Economics and Business Administration (SNF) as part of its research programme "Crisis, Restructuring and Growth". The aim of the programme is to map the causes of the crisis and the subsequent real economic downturn, and to identify and analyze the consequences for restructuring needs and ability as well as the consequences for the long-term economic growth in Norway and other western countries. The programme is part of a major initiative by the NHH environment and is conducted in collaboration with The Norwegian Ministry of Trade and Industry, The Research Council of Norway, The Confederation of Norwegian Enterprise/ABELIA and Sparebanken Vest/Bergen Chamber of Trade and Industry/Stavanger Chamber of Trade and Industry.

INSTITUTE FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION
BERGEN, DECEMBER 2013
ISSN 1503-2140

INNOVATION, HUMAN CAPITAL AND EXOGENOUS SHOCKS

Eirik Sjåholm Knudsen & Lasse B. Lien

Department of Strategy and Management

NHH Norwegian School of Economics

Helleveien 30, 5045 Bergen, Norway

eirik.knudsen@nhh.no, lasse.lien@nhh.no

ABSTRACT

Strategic entrepreneurship is about the simultaneous exploitation of existing advantages and the creation and exploitation of new opportunities. These are often referred to as the strategy- and the entrepreneurship dimension, respectively. We examine how the relative emphasis on the two dimensions of strategic entrepreneurship affects how firms behave with respect to human capital in the context of one particular exogenous shock, namely recessions. We hypothesize and find that the higher the focus on the entrepreneurial dimension, the more firms invest in training, the more likely they are to hire, and the more likely they are to lay off employees. Finally, we also find that these firms are more likely to combine the accumulation of human capital through training with both hiring and firing. In sum, these findings show how challenges and opportunities created by environmental change differ depending on the relative emphasis on the two dimensions. They also show how firms focusing on the entrepreneurial dimension more actively pursue the opportunities created by increased labor market imperfections in recessions. These results contribute to the literature by highlighting how recessions affect firms' flow of human capital investments, and subsequently stocks, depending on their weighting of the two dimensions of strategic entrepreneurship.

Keywords:
Recession, innovation, human capital, exogenous shock, corporate entrepreneurship

INTRODUCTION

Change in the environment is a core issue for researchers in strategic entrepreneurship. The reason is that environmental change creates entrepreneurial opportunities via new or increased factor market imperfections, while at the same time threatening existing advantages (Alvarez and Barney, 2007). Strategic entrepreneurship is about the *simultaneous* exploitation of existing competitive advantages (the strategic dimension) and the creation and exploitation of new opportunities (the entrepreneurial dimension) (Ireland, Hitt and Sirmon, 2003). A change in the environment may pose different challenges for these two dimensions. As Ketchen (2007: p. 291) notes:

> *While firms relying on either strategy or entrepreneurship only have to deal with one of these [dimensions], the pursuit of strategic entrepreneurship requires a firm to be able to grapple with both [….]*

In this paper we examine how the relative emphasis on the entrepreneurial dimension affects how firms behave with respect to human capital in the context of one particular exogenous shock, namely recessions. It is well documented that labor market imperfections spike during recessions, and our aim here is to contrast how firms with different emphasis on the two dimensions of strategic entrepreneurship respond to the threats and opportunities these factor market imperfections create.

Using a random sample of 1248 Norwegian firms, we find that increased emphasis on the entrepreneurial dimension is associated with higher investments in training, greater likelihood of layoffs, and - perhaps surprisingly- also greater likelihood of hiring. We also find that the entrepreneurial dimension increases firms' likelihood of combining the accumulation of human capital through training with both hiring and firing. These findings indicate that such firms are more actively pursuing opportunities created by labor market imperfections than firms that emphasize the strategy dimension. This is consistent with Simsek and Heavey (2011) who find that engaging in corporate entrepreneurship (the entrepreneurship dimension) are more prone to invest in the knowledge capital residing in people (human capital). One difference between our work and theirs is that we investigate this behavior in the context of an exogenous environmental shock that brings about increased opportunities (and threats) via increases in factor market imperfections in the "market" for people.

Our main claims are the following: The more a firm emphasizes the entrepreneurial dimension, the more the firm will hoard labor in periods of excess capacity. Labor hoarding refers to retaining labor with idle capacity (in their original tasks). Hoarded labor can be used for two purposes particularly relevant to human capital accumulation: It can be trained, or it can be used to train others. When hoarded labor is trained, excess capacity will lead to increased human capital accumulation, but notably only if there is a significant amount of firm specific knowledge. Entrepreneurial firms place greater emphasis on innovation and new opportunities. This drives them to become less similar to other firms in terms of their products, processes and market approaches, which means that they will rely more on knowledge that is specific to the firm's unique intentions and needs. Therefore, firm specific knowledge is likely to be relatively more important for such firms. In the absence of specific knowledge, labor hoarding is unlikely to occur, and idle employees will more likely be laid off.

When hoarded labor is used to train others, excess capacity can make hiring new employees more attractive for two reasons: i) training costs are lowered (opportunity costs of personnel used to train others) and ii) recruitment costs are lower due to higher supply and lower demand in the external labor market. Put differently: when the factor market for human capital is less well functioning, as it tends to be in recessions, human capital can be acquired at prices below their "intrinsic value". By this we mean that the required compensation to motivate potential employees to undertake firm specific training programs are unusually low, and the costs of supplying such training is also below normal. This implies that firms can transform the short term imperfections in labor markets to long term rents by exploiting the unusually low opportunity cost of training new hires in firm specific knowledge and skills.

As we elaborate below, this results in the prediction that in a recession, emphasis on the entrepreneurial dimension should, via reliance on firm specific knowledge, make firms more inclined to i) keep employees with high firm specific knowledge (and more inclined to lay off employees with low firm specific knowledge), ii) increase training of employees with high firm specific knowledge, iii) increase hiring of employees with the intention of building firm specific knowledge, and iv) increased likelihood of combining training, hiring and layoffs. We find empirical support for all four hypotheses.

The rest of the paper is organized as follows. First, we present theory and develop hypotheses regarding the behavior of firms with regard to human capital in recessions. Then, we test our

hypotheses empirically on a dataset from the recession in the wake of the recent financial crisis, before discussing implications of our findings.

THEORY AND HYPOTHESES

A core issue in the strategy field is to explain performance differences between firms, and how and when such differences can persist (Rumelt, Schendel and Teece, 1994). A firm is said to have a competitive advantage when it manages to create more economic value than the marginal competitor in the relevant product market (Peteraf and Barney, 2003). The resource based view sees firms as heterogeneous bundles of resources and capabilities, and explains sustained competitive advantage by the control of valuable and rare resources and capabilities that are difficult for competitors to imitate (Barney, 1986, 1991; Peteraf, 1993; Wernerfelt, 1984).

Strategic entrepreneurship is not only about exploitation of existing competitive advantages, but also (and simultaneously) about the creation and exploitation of new opportunities. Firms are likely to differ in their emphasis on these two dimensions of strategic entrepreneurship. Firms that give prominence to new opportunities through innovation in products, processes or markets served, are emphasizing the entrepreneurship dimension. Conversely, firms that give prominence to building or exploiting advantages in existing products, processes or markets are emphasizing the strategy dimension.

The stocks of human capital are likely to differ in several respects across firms depending on their relative emphasis on the two dimensions. Firms that emphasize innovation and new opportunities are less similar to other firms in their products, processes and market approaches. By necessity this means that they will rely more on knowledge that is specific to the firm's idiosyncratic needs. In other words, the exploitation and constant development of new firm specific knowledge is likely to be more important to such firms. We do not claim that firms that give priority to the strategy dimension do not exploit and develop specific human capital, but we do claim that the more firms do things differently from their peers, the more they will be forced to rely on firm specific knowledge. So the relative importance of firms' specific knowledge among the two types of firms should be systematically different.

Firm specific knowledge can reside in human capital, social capital and organizational capital (Simsek and Heavey, 2011). Our focus here is mainly on human capital, the knowledge and skills embedded in firms' employees (Coff, 1997; Crook et al., 2011; Hatch and Dyer, 2004).

Firm specific human capital is the knowledge or skills embodied in employees with substantially lower value outside the firm than inside (Becker, 1962; Hatch and Dyer, 2004; Kor and Leblebici, 2005). The higher the level of firm specific knowledge of an employee, the more likely it is that the knowledge will be retained in the firm (rather than being bid away to keep the employee in the firm) (Campbell, Coff and Kryscynski, 2012). The logic behind this prediction is that the firm's "use value" of the knowledge specific employee is higher than the employees "exchange value" in the labor market. From this it follows that the firm needs to pay the worker with firm specific knowledge a wage that is higher than the employee's exchange value in order to: i) give the employee incentives to invest in firm-specific knowledge in the first place, and ii) to keep that firm specific knowledge in the firm.

The link between firm specific human capital and sustained competitive advantage is twofold. First, firm specific knowledge is by definition rare, which gives the firm an advantage over its competitors if the knowledge is above average in terms of its contribution to value creation. Second, the difference in use- and exchange value of a firm specific employee serves as an isolating mechanism that reduces the incentives for the employee to leave the firm, which in turn can make competitive advantages persist and be appropriable by the firm. The higher the portion of firm specific knowledge compared to general knowledge an employee possesses, the higher the ratio of use- to exchange value.

The above discussion highlights the common link between firm specific human capital and competitive advantage. However, in this paper we suggest another way in which firm specific knowledge can be linked to competitive advantage, namely through how it affects *firms' incentives* to invest in human capital over the business cycle. More specifically, we argue that reliance on firm specific knowledge increases a firm's incentives to increase human capital investments in periods of low demand, such as recessions or industry troughs. This way, the high reliance on firm specific knowledge associated with the entrepreneurship dimension influences competitive behavior indirectly by differently affecting firms' incentives to carry out human capital investments in periods of low demand.

Labor hoarding

All firms face the issue of how it should allocate its human capital. For simplicity, let us assume that human capital can be used for two purposes: either to produce output, or it can be used for development – for example organizational improvements, training, and development of new products- and processes (Hall, 1991: reference withheld). The standard solution to this allocation problem is to add capacity in both activities until the expected return from adding more is zero on the margin for both. Consider now a firm that experiences some kind of negative demand shock that results in significant excess capacity in its production activities. The firm now faces the choice between reducing the excess capacity by laying off employees and rehire if demand picks up, or it can hoard some (or all) of the idle personnel and reallocate them from output production to development activities.

In general, the outcome of this new decision problem depends on four conditions (reference withheld). First is the probability that the idle capacity will be needed in the future. If this probability is low, the firm will simply turn to layoffs. Second are the adjustment costs of hiring and firing employees. This can include layoff costs and the costs of searching and training new employees to bring them up to the productivity level of the employees one considers laying off. The higher the adjustment costs, the more a firm will chose labor hoarding over layoffs (CP). Third is the value employees can generate if reassigned from production to development. Clearly, the more value employees can create in development activities, the more attractive the option of labor hoarding will be. Forth, and finally, is the ability of firms to finance the short term losses associated with hoarding labor. Firms with poor finances will be less likely to hoard labor, simply because short term financing constraints forces the firm's hand in favor of layoffs.

With the above discussion in place, we can now link the likelihood of observing labor hoarding to the level of firm specific knowledge. Employees with high levels of firm specific knowledge will be associated with higher adjustment costs and have a higher expected value in firm specific development activities. The high adjustment costs come from the need to re-accumulate the firm specific knowledge if the firm chooses a fire/re-hire approach, while the higher expected value of development activities follows from the well-established cumulative effects of knowledge accumulation (Dierickx and Cool, 1989; Hatch and Dyer, 2004). The more you know, the easier it is to learn more. In sum, this implies that the higher the level of firm specific knowledge of an employee, the more likely it is that he/she will be hoarded by

the firm (CP). But what should the firm use the hoarded labor for? With respect to human capital accumulation, it can be used for two general purposes. It can be trained, or it can be used to train others.

To be trained

Investing in development activities like training becomes more attractive for firms with excess capacity. The reason for this is that low capacity utilization reduces the opportunity costs of taking employees out of their ordinary tasks. Put differently, employees with nothing better to do might as well spend time on developing their skills and knowledge. This reduction in the opportunity costs of training implies that the incentives to train employees become stronger as demand falls. If so, the human capital accumulation is likely to be sped up.

There is a substantial amount of empirical evidence to support the existence of this mechanism, but this evidence is on the aggregate, economy-wide level, and is found in the business cycle literature in macroeconomics (Aghion et al., 2012). The essence here is that recessions cause booms in productivity improvements by lowering the costs of focusing on productivity improvements vs. producing output. When the economy is in a boom, the emphasis is on producing output, while when the economy goes into recession - and excess capacity increases - more attention is shifted to productivity improvements (Aghion and Saint-Paul, 1998; Davis and Haltiwanger, 1990; Hall, 1991).

Put differently, the underlying logic is that labor hoarding means idle capacity and idle capacity in turn makes training more attractive for firms with high levels of firm specific knowledge. If our previous assumption that emphasis on the entrepreneurship dimension is correlated with emphasis on firm specific knowledge is correct, this suggests the following hypothesis:

> *H1: For equal negative shocks, emphasis on the entrepreneurship dimension increases the propensity to invest in training.*

As we have seen, when an employee has a high level of firm specific knowledge the firm has incentives to keep that employee in periods of low demand, while layoffs are more attractive

for employees with general knowledge. Firms will thus be less likely to lay off employees with high firm specific knowledge, and have a higher likelihood of laying off employees with low firm specific knowledge. This, held together with the fact that labor hoarding is costly, leads to the somewhat counter intuitive prediction that entrepreneurial firms with a high share of specific-labor are more inclined to turn to layoffs if it experiences excess capacity. However, the logic is simple. Firms do not have incentives to hoard non-specific employees, so laying off these employees saves costs that can be used to finance the short term losses of hoarding employees with high firm specific knowledge. Also, firm specific labor is likely to be more costly to the firm in the first place (e.g have higher salaries than non-specific labor) (e.g. Becker, 1962), which implies that the number of non-specific employees that needs to be laid off to finance the hoarding of one firm specific employee is > 1. In sum, because of a high share of firm specific knowledge entrepreneurial firms are likely to turn faster to layoffs of its non-specific labor force to finance the labor hoarding of its specific labor. This leads to the following hypothesis:

> *H2: For equal negative shocks, emphasis on the entrepreneurship dimension increases the propensity to lay off non-specific employees*

To train others

Another use for excess capacity is to train others, for example new employees. This can be thought of as a shift in the supply curve for "trainers". This makes hiring more attractive for firms that have incentives to hoard labor (CP), since the cost of investing in human capital accumulation has been reduced. Furthermore, in a recession labor demand declines, labor markets become more imperfect and typically do not clear. The price of talent may therefore be unusually low and the willingness of potential employees to submit to firm-specific training may be unusually high. Lowered cost of training will also make it cheaper to add firm specific knowledge to general talent (with the potential to accumulate firm-specific knowledge). This in turn implies an opportunity to earn rents by exploiting short term imperfections to generate long term rents as hires are converted to firm specific human capital at low cost. Finally, there may also be economies of scale in training, for example by training more employees at the same time, potentially making hiring even more attractive. In sum, because of a high share of firm specific knowledge, entrepreneurial firms are more inclined to

increase hiring of employees that can be converted to firm specific labor. This leads us to formulate the following hypothesis:

> *H3: For equal negative shocks, emphasis on the entrepreneurship dimension increases the propensity to hire new employees*

Combining the measures

The measures discussed above are complementary in the sense that the higher the returns from investments in training, the stronger the incentives to hire new employees with the aim to train them. This follows from excess capacity in trainers, cheaper talent due to labor market imperfections and economies of scale in training. Moreover, the higher the returns to training and hiring, the higher the likelihood that a firm will be willing to layoff general labor to be able take advantage of these opportunities. In short, this amounts to an expectation that firms that emphasize the entrepreneurial dimension will be relatively more likely to combine all three measures. This leads to the following hypothesis:

> *H4: For equal negative shocks, emphasis on the entrepreneurship dimension increases the propensity to combine training, layoffs and hiring*

DATA AND METHODS

We use data from an extensive questionnaire about the effects of the recent financial crisis and the subsequent recession on Norwegian firms. The survey was distributed to the CEO of 5000 Norwegian firms in November 2010, randomly drawn from the population of Norwegian firms with the following limitations: Firms had to have a minimum turnover of NOK 10 million ($ 1.7 million) in 2007, and a salary expenses of minimum NOK 3 million ($ 0.5 million). This was done to avoid the large number of small firms that are set up as tax shelters with no real operations. We also removed all government owned firms, and members of industries that are dominated by non-profit organizations. We also eliminated banking and insurance, since our interest is in the nonfinancial sector. We received a total of 1248 responses, yielding a response rate of 25 % which is above the median for surveys using CEOs as respondents. Missing data from the survey or missing accounting data reduced the sample to approximately 1000 usable responses. We could find no response bias with respect to size, profitability, industry membership, debt ratio, growth and geography.

We use a total of four dependent variables measuring different aspects of firms' behavior with respect to human capital in the recession, namely whether or not firms turned to *layoffs*, whether they *changed the number of employees*, whether they *increased training* of employees, and finally, the categorical variable *human capital responses* that encompass all different combinations of the three former responses. The two variables *layoffs* and *increased training* are binary variables (1 if yes, 0 if no) based on single item questions from the questionnaire. *Change in the number of employees* during the recession is constructed based on two items from the questionnaire, the number of fixed employees before and -after the recession, and is measured as the percentage change between these two numbers. An alternative way to study if firms hired during the recession would be to ask them directly, but such a question was unfortunately not included in the survey. *Human capital responses* is a nominal variable intended to capture the different combinations of the responses measured by the three other dependent variables. To generate this variable, we first recoded *Change in no. employees* to a binary variable (*increased hiring_dummy*) where firms that increased the number of employees during the recession were given the value 1, and all else the value 0. Next we created eight different categories encompassing all possible combinations of *increased training*, *increased layoffs* and *increased hiring_dummy*. The frequencies and descriptive statistics of the dependent variables are shown in table 1-3.

[INSERT TABLES 1-4 HERE]

We have two independent variables, *innovation strategy* and *cost strategy*. Both variables were constructed based on items from the survey where the firms were asked to evaluate the importance of a different set of strategic parameters for their firm before the recession on a scale of 1 to 7. The *innovation strategy* variable is based on four items, namely "innovation and R&D", "focus on implementing new solutions (technology, systems)", "development and launch of new products and services", "development of existing products/services". After summarizing the four items, the variable ranges from 4-28 (Cronbach's alpha of 0.808). The *cost strategy* variable is based on the item "focus on reducing operating costs", and ranges from 1-7. *Innovation strategy* is the variable of most interest to us as this measure is closest to our theoretical concept of focusing on the entrepreneurial dimension of strategic entrepreneurship. Firms having a cost strategy is likely to focus more on exploiting existing advantages, and we use that as a contrast to check if these two variables have the opposite sign in our regressions (as we would expect). Other strategies (than cost) could also have worked as a contrast to the innovation strategy, but we favor using cost since this is a strategy

that is usually associated with persistent focus on exploiting existing advantages (by doing existing work better). Innovation strategies are, in contrast, about creating or exploiting new opportunities.

As control variables, we include a set of firm- and industry level variables to control for the treatment (the recession) not being randomly assigned to firms. In doing so, we control for differences across firms and industries that earlier theoretical- and empirical research has found to affect how severely firms are hit by recessions (Petersen and Strongin, 1996, reference witheld). These include the share of revenue from *durable goods*, the share of employees (in percent) that have more than four years of *higher education*, the firms *export intensity*, *-size* (Ln sales), *age* (Ln age), *pre-recession profits* (industry adjusted), *pre-recession growth* (industry adjusted) and *pre-recession leverage* (industry adjusted). The first three variables are based on data from the questionnaire while the latter five are based on accounting data from 2007 - the last observations available before the recession. We also include two control variables on the distinct effects of the recession on firms operations, namely *demand problems* and *credit problems.* These are included to control for the "amount" of crisis that the firms experienced, to avoid the possibility that our findings reflect systematic differences between the business cycle risks of different strategies. *Credit problems* is constructed based on an item where respondents were asked to rate how their access to credit was affected by the crisis on a scale from -3 (reduced) to + 3 (increased) with 0 indicating no change. This scale was then recoded to a 1-7 scale and reversed, so that a higher score reflects larger reductions in access to credit. *Demand problems* is constructed by summing up two items from the survey where the respondents were asked to i) evaluate how the crisis had affected the demand for the firms products and services and ii) how the crisis affected their capacity utilization. Both items has scales ranging from -3 (reduced) to +3 (increased) with 0 indicating no change. These scales were also recoded to a 1-7 scale, and reversed so that a higher value reflects a larger reduction in demand. After summarizing the two items, the scale ranges from 2-14.

FINDINGS

We use logistic regressions to test our two first hypotheses as the dependent variables of interest, *training* and *layoffs,* are binary. The basic models are shown in equation 1 and 2:

(1) $\text{Logit } Y_{1\text{-}2} = \alpha + \beta_1 \text{Innovation Strategy} + \beta_2 \text{ Cost Strategy} + \beta_3\text{-} \beta_{12} \text{ Controls} + \varepsilon$

Where Logit Y is the natural logarithm of the odds that a firm actually lay off employees/ increase training of employees in response to the recession:

(2) $\ln [p(Y = 1) / (1 - p(Y = 1)]$

First we use *increased training* as the dependent variable, and find that the model is significant on a 0.05 level with a Chi-square value of 25.557 and a Pseudo R2 of 0.034. H1 predicts that pursuing an innovation strategy is positively related to training of employees in recessions, which implies that *innovation strategy* should be positively related to *increase training*, while *cost strategy* should be negatively related. This is indeed what we find ($p < 0.01$ and $p < 0.05$ respectively), and we therefore conclude that H1 is supported.

We then test the relationship between the two independent variables and whether or not firms turned to layoffs during the recession. We use *layoffs* as the dependent variable, and find that the model is significant on a 0.01 level with a Chi-square value of 129.984 and a pseudo R2 of 0.167. H2 predicts that pursuing an innovation strategy is positively correlated with layoffs, which implies that *innovation strategy* should be positively signed and *cost strategy* negatively signed. We find that both the independent variables are signed as predicted, but also that only the *innovation strategy* variable is statistically significant ($p<0.01$). However, since the difference between the two coefficients is statistically significant, we also conclude that H2 is supported. The results discussed this far are presented in Table 5.

[INSERT TABLE 5 HERE]

Next, we use OLS regression to test the relationship between innovation strategies and the percentage *change in no. employees* over the recession. The basic model is shown in equation 3:

(3) $Y_3 = A + \beta_1 \text{Innovation Strategy} + \beta_2 \text{ Cost Strategy} + \beta_3\text{-}\beta_{12} \text{ Controls} + \varepsilon$

We find that the model is significant on a 0.01 level with an F-value of 6.733 and an adjusted R^2 of 0.065. H3 predicts that innovation strategy is positively related to the percentage change in employees over the recession. This implies that *innovation strategy* should be positively signed, while *cost strategy* should be negatively signed. We find that this is the case, although only the latter is statistically significant on ($p<0.01$) while the former is marginally insignificant ($p = 0.053$). Again, since the difference between the two coefficients is

statistically significant, we also conclude that H3 is supported. The results regarding changes in employees over the recession is presented in table 6.

[INSERT TABLE 6 HERE]

The analyses above estimate the relationship between the independent variables and the three different variables separately, and do not take into consideration how firms combine the three different responses of training, layoffs and hiring. To cope with this, we estimate a multinomial logistic regression model using *human capital responses* as the dependent variable. First, we use the first category (0=no responses whatsoever) as the reference category, and compare the probability of a firm being in this category with the probability of being in the other seven categories (Menard, 2010). We have eight possible outcome categories of our dependent variable, and estimation of the multinomial logistic model thus requires the calculation of seven different logistic regression equations (one for each category as compared to the reference category) (Menard, 2010). The results of these estimations are reported in Table 7.

[INSERT TABLE 7 HERE]

From the analysis we find that the model is significant on a 0.01 level with a Chi-square value of 238.211 and a Pseudo R^2 of 0.220. The former three hypotheses predict that firms pursuing an innovation strategy are more inclined to i) increase training, ii) turn to layoffs and iii) increase hiring in response to recessionary pressures. The three outcome variables of particular interest is thus category 3 (increased training and -layoffs), category 5 (increased training and -hiring) and category 7 (increased training, -layoffs and -hiring). From inspecting the coefficients, we see that the *innovation strategy* variable is positive and significant on a 0.01, 0.05 and 0.01 level for the category 3, 5, and 7 respectively, while the opposite is the case for the *cost strategy* variable, which is negatively signed ($p<0.05$, $p<0.1$ and $p<0.05$ levels respectively). These results indicate that the more a firm emphasize the entrepreneurial dimension, the more likely they are to be in category 3, 5 or 7 as compared to not taking any action at all (category 0). From inspecting coefficient sizes, we also see that the coefficients are largest in absolute values for both the independent variables in category 7, which is consistent with our theoretical predictions that the more a firm emphasizes the entrepreneurial dimension (innovation strategy), the more it will combine training, layoffs *and* hiring. Conversely, the more a firm emphasizes the exploiting existing advantages (cost strategy), the less likely they are to combine all three measures. Furthermore, we see that the two

independent variables are insignificant at conventional levels for the categories that do not follow from our hypotheses and the labor hoarding argument (category 2, 4 and 6). Finally, we see that both independent variables are insignificant for category 1 where firms increased training but did not turn to layoffs or hiring. At first glance, this result may seem surprising. However, it is consistent with hypotheses 4 which predicted that firms with high levels of firm specific knowledge use layoffs of staff with general skills as a way of financing labor hoarding of employees with firm specific knowledge. To investigate this issue further, we estimate the same multinomial logistic model using category 1 as the reference category (increased training, no firing or hiring) instead of category 0 (no change whatsoever) as in the previous model. Doing so makes it possible to see if firms are more likely to combine increased training with layoff- and hiring responses, than to solely increase training.

[INSERT TABLE 8 HERE]

From this exercise we find that pursuing an innovation strategy makes firms significantly more likely to be in category (3, 5 and 7) than in category 1, and that the coefficient sizes were larger for category 7 (0.105) than for category 5 (0.031) and category 3 (0.045). This shows that innovation emphasis increases the likelihood that firms combine training with hiring and/or firing, rather than merely to increase training. The pattern arising from Table 7 and 8 is consistent with the idea that excess capacity created by a recession changes both the incentives to train, hire and fire employees. Furthermore, the pattern is consistent with the idea that reliance on firm specific knowledge influences the nature, strength and combination of responses in the manner suggested by our three hypotheses.

To further investigate hypothesis four, we conduct the same exercise as above using category 2 (only increase layoffs) and category 4 (only increase hiring) as the reference category (table 9 and 10). These analyses show the same pattern as the previous analysis. That is, firms pursing an innovation strategy are significantly more likely to be in the categories combining the different human capital measures (3, 5 and 7) than they are to use layoffs or hiring exclusively. Further, we also see that the coefficient sizes for category 7 is larger than for category 5 and 3 in both regressions. Again this indicate that firms emphasizing the entrepreneurial dimension by pursuing an innovation strategy are more likely to combine the different human capital responses as compared to only doing one of them in isolation. This amounts to support for H4.

[INSERT TABLES 9 and 10 HERE]

CONCLUSION AND IMPLICATIONS

This paper has investigated the relationship between innovation, firm specific knowledge, human capital accumulation, and labor market behavior during a recession. We have developed hypotheses by combining resource based theory and the business cycle literature in macroeconomics, a combination we found to be fruitful both theoretically and empirically. For example, we found that innovative firms, due to higher reliance on firm specific knowledge, are more inclined to increase investments in training during a recession. We believe this is caused by the high adjustment costs related to hiring and firing employees, combined with the low opportunity costs of firm-specific labors' time during periods of excess capacity. Second, we found that firms with higher emphasis on innovation are more inclined to lay off employees in recessions, and also more inclined to hire employees. We suggest that the first effect is driven by the weaker incentives to hoard non-specific labor, while the latter effect is driven by the lower opportunity costs of using existing employees to train others, combined with labor market conditions that permits hiring and training of talent at an unusually low cost. Finally, we also tested how firms combine the three responses of training, layoffs and hiring. From these analyses, we found that the more a firm focuses on innovation, the more likely it is to combine training of hoarded labor, with layoffs and hiring. We suggest that these results can be explained by the tendency of such firms to i) use layoffs of employees with mostly general knowledge to finance hoarding of employees with more specific knowledge and ii) exploit inefficiencies in the labor market to hire and train talent to increase their stock of firm specific knowledge.

In sum, our results highlight how recessions can have important effects on competitive behavior in the post-recession period by differently affecting firms' investments in human capital and also their labor market behavior. This has several potential implications for the literature on the strategic entrepreneurship. First, our results indicate that fluctuations in demand have different effects on firms' human capital accumulation and labor market behavior depending on the role of firm specific knowledge in the firm's strategy. This highlights one way in which exogenous changes in firms' environment can have profound effects on firms' competitive advantage through affecting incentives to invest in human capital. Second, our results indicate a potential "positive" effect of recessions for firms with incentives to hoard labor. The reduced costs of training and other productivity boosting

activities can create advantages that will be difficult to imitate for other firms once demand picks up (reference withheld). This, combined with the finding that firms with an innovation focus also seem to reduce their stock of non-specific employees, may imply that such firms rise from a recession as smarter than they were before the recession. The firms with advantages with respect to firm specific human capital can easily rehire general human capital that is laid off during a recession, while a firm that finds itself lagging its competitors in terms of firm specific human capital cannot equally quickly remove such a disadvantage.

Summing up, it should perhaps not come as a surprise that firms with strategies that stress exploiting new opportunities are more likely to exploit labor market opportunities brought about by a recession.

Finally, our analysis is not without limitations. One limitation that should be addressed in future research is the link between innovation and reliance on firm specific knowledge. We have assumed that there is a strong correlation between the two. However, the link between reliance on firm specific knowledge and innovation is not bullet proof. Due to limitations in our data, we have unfortunately not been able to measure firm-specific knowledge directly. This should be done in future work. Another limitation is that we use single-respondent survey data. As discussed in the methods section, this exposes us to a range of potential biases. Last, but not least, our data are basically cross-sectional. These means that we cannot claim to have shown any causal relationships in our work. Nevertheless, we believe that the theoretical predictions combined with the patterns we found in our data are sufficiently interesting to warrant research that transcends these limitations.

REFERENCES

Aghion P, Askenazy P, Berman N, Cette G, Eymard L. 2012. Credit Constraints and the cyclicality of R&D Investment: Evidence from France *Journal of the European Economic Association* **10**(5):1001-1024.

Aghion P, Saint-Paul G. 1998. Virtues of bad times: Interaction Between Productivity Growth and Economic Fluctuations. *Macroeconomic Dynamics,* **2**(3):322-344.

Alvarez SA, Barney JB. 2007. Discovery and creation: alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal* **1**(1-2):11-26.

Barney JB. 1986. Strategic Factor Markets: Expectations, Luck, and Business Strategy. *Management Science* **32**(10):1231-1241.

Barney JB. 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management* **17**(1):99-120.

Becker G. 1962. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy* **70**:9-49.

Campbell BA, Coff R, Kryscynski D. 2012. Rethinking Sustained Competitive Advantage from Human Capital, . *Academy of Management Review,* **37**(3):376-395.

Coff RW. 1997. Human Assets and Management Dilemmas: Coping with Hazards on the Road to Resource-Based Theory. *The Academy of Management Review* **22**(2):374-402.

Crook TR, Todd SY, Combs JG, Woehr DJ, Ketchen Jr. DJ. 2011. Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology* **96**(3):443-456.

Davis SJ, Haltiwanger J. 1990. Gross Job Creation and Destruction: Microeconomic Evidence and Macroeconomic Implications. *NBER Macroeconomics Annual* **5**:123-168.

Dierickx I, Cool K. 1989. Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science* **35** (12):1504-1511.

Hall RE. 1991. Recessions as Reorganizations In *Paper presented at the NBER Macro Annual Conference.*

Hatch NW, Dyer JH. 2004. Human capital and learning as a source of sustainable competitive advantage. *Strategic Management Journal* **25**(12):1155-1178.

Ireland RD, Hitt MA, Sirmon DG. 2003. A Model of Strategic Entrepreneurship: The Construct and its Dimensions. *Journal of Management* **29**(6):963-989.

Ketchen DJ. 2007. Change. *Strategic Entrepreneurship Journal* **1**(3-4):291-293.

Kor YY, Leblebici H. 2005. How do interdependencies among human-capital deployment, development, and diversification strategies affect firms' financial performance? *Strategic Management Journal* **26**(10):967-985.

Menard S. 2010. *Logistic Regression: From Introductory to Advanced Concepts and Applications*. Sage Publications: Thousand Oaks, CA.

Peteraf MA. 1993. The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal* **14**(3):179-191.

Peteraf MA, Barney JB. 2003. Unraveling the resource-based tangle. *Managerial and Decision Economics* **24**(4):309-323.

Petersen B, Strongin S. 1996. Why Are Some Industries More Cyclical than Others? *Journal of Business & Economic Statistics* **14**(2):189-198.

Rumelt RP, Schendel DE, Teece DJ. 1994. *Fundamental issues in strategy: A research agenda*. Harvard Press School Press: Boston, MA.

Simsek Z, Heavey C. 2011. The mediating role of knowledge-based capital for corporate entrepreneurship effects on performance: A study of small- to medium-sized firms. *Strategic Entrepreneurship Journal* **5**(1):81-100.

Wernerfelt B. 1984. A resource-based view of the firm. *Strategic Management Journal* **5**(2):171-180.

Table 1 Frequencies Dependent Variables

	Increased Training		Layoffs	
	Frequency	Percent	Frequency	Percent
0	498	39,9	765	61,3
1	733	58,7	467	37,4
Missing		17	1,4	16
Total		1248	100,0	1248

Table 2 Descriptive Statistics Change in Number of Employees

% Change in no. Employees		
N	Valid	1228
	Missing	20
Mean		,005
Median		,000
Std. Deviation		,313
Variance		,098
Minimum		-1,00
Maximum		3,50

Table 3 Frequencies dependent variables Human Capital Responses

Categories	Incr. Training	Incr. Layoffs	Incr. Hiring	Frequency	Percent
0	No	No	No	240	19,2
1	Yes	No	No	249	20,0
2	No	Yes	No	119	9,5
3	Yes	Yes	No	251	20,1
4	No	No	Yes	109	8,7
5	Yes	No	Yes	153	12,3
6	No	Yes	Yes	23	1,8
7	Yes	Yes	Yes	67	5,4
Missing				37	3,0
Total				1248	100

Table 4 Means, standard deviatons and correlation coefficients of independent- and control variables

	N	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11	12
1. Innovation strategy	1233	17,74	4,86	1											
2. Cost strategy	1232	4,60	1,51	.343***	1										
3. Demand problems	1210	9,63	2,36	-.057**	-.064**	1									
4. Credit problems	1219	4,30	1,03	-0,045	-,038	.278***	1								
5. Share high education	1123	11,78	21,90	.137***	.105***	0,003	.064**	1							
6. Firm profits 2007	1230	,00	,13	,037	.059**	-0,036	-.123***	-,027	1						
7. Firm leverage 2007	1230	,04	,25	-0,056*	-,035	-0,031	,024	-,018	-.194***	1					
8. Firm growth 2007	1185	,31	4,19	-,021	,013	-0,04203	-,001	.072**	-.256***	0,056*	1				
9. Durable goods share	1235	47,60	44,83	0,059**	-,013	.165***	-,002	-.119***	0,001	-.079***	-0,018	1			
10. Firm size	1230	10,60	1,09	,032	,030	.125***	.062**	0,056*	-0,016	-0,051*	0,047	.140***	1		
11. Age	1230	2,50	,83	,021	-,012	-0,00198	-.067**	-,031	0,014	-.151***	-0,056*	.119***	.147***	1	
12. Export intensity	1246	8,42	21,46	-,029	-,009	.105***	.086***	.164***	-.188***	-,037	0,006	-0,008	.213***	0,02	1

***, **, and * represent statistical significance (2-tailed), at the 1, 5, and 10 percent levels respectively.

Table 5 Logistic regression output

Dependent variable	*Increased Training*		*Layoffs*	
	Model 1a	*Model 1b*	*Model 2a*	*Model 2b*
Independent variables				
Innovation Strategy		0.053***		0.042***
		(0.015)		(0.016)
Cost-strategy		-0.096**		-0.039
		(0.047)		(0.050)
Control variables				
Demand problems	0.055*	0.058*	0.266***	0.272***
	(0.030)	(0.030)	(0.034)	(0.035)
Credit problems	0.030	0.031	0.189**	0.191***
	(0.068)	(0.069)	(0.074)	(0.074)
Share high education	0.000	-0.003	-0.005	-0.007**
	(0.003)	(0.003)	(0.004)	(0.004)
Firm profits 2007	0.237	0.256	-1.509**	-1.504**
	(0.498)	(0.500)	(0.650)	(0.656)
Firm leverage 2007	0.263	0.316	0.509	0.551*
	(0.277)	(0.278)	(0.330)	(0.330)
Firm growth 2007	-0.004	-0.002	-0.061*	-0.059*
	(0.015)	(0.015)	(0.034)	(0.034)
Durable goods share	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Firm size	0.125*	0.125*	0.131**	0.127*
	(0.064)	(0.064)	(0.066)	(0.066)
Age	-0.055	-0.060	-0.035	-0.039
	(0.089)	(0.090)	(0.095)	(0.096)
Export intensity	-0.002	-0.001	-0.001	0.000
	(0.003)	(0.003)	(0.004)	(0.004)
Constant	-1.478**	-1.952**	-5.229***	-5.779***
	(0.737)	(0.788)	(0.797)	(0.853)
N	991	991	993	993
-2LL	1319.913	1306.382	1199.302	1192.374
Model Chi-square	12.026	25.557**	123.056***	129.984***
Nagelkerke R2	0.16	0.034	0.158	0.167

Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 6 OLS regression output

Dependent variable	*Change in no. employees*	
	Model 3a	*Model 3b*
Independent variables		
Innovation Strategy		0.004*
		(0.002)
Cost-strategy		-0.020***
		(0.007)
Control variables		
Demand problems	-0.024***	-0.025***
	(0.001)	(0.004)
Credit problems	-0.004	-0.004
	(0.010)	(0.009)
Share high education	0.001	0.000
	(0.000)	(0.000)
Firm profits 2007	0.214***	0.216***
	(0.071)	(0.071)
Firm leverage 2007	-0.037	-0.033
	(0.036)	(0.036)
Firm growth 2007	0.001	0.001
	(0.002)	(0.002)
Durable goods share	0.000	0.000
	(0.000)	(0.000)
Firm size	0.004	0.005
	(0.009)	(0.009)
Age	-0.027**	-0.027**
	(0.012)	(0.012)
Export intensity	-0.001	-0.001
	(0.000)	(0.000)
Constant	0.293***	0.315***
	(0.101)	(0.108)
N	990	990
F-value	7.007***	6.733***
R2	0.067	0.076
Adjusted R2	0.057	0.065

Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 7 Multinomial Logit Regression Output[a] - Category 0 as the reference category[b]

Dependent variable					HC-responses[b]
Category	Incr. Training	Incr. Layoffs	Incr. Hiring	Ind. Variables	
1.00	Yes	No	No	Innovation Strategy	0.028
					(0.023)
				Cost-strategy	-0.028
					(0.074)
2.00	No	Yes	No	Innovation Strategy	0.000
					(0.029)
				Cost-strategy	0.127
					(0.094)
3.00	Yes	Yes	No	Innovation Strategy	0.072***
					(0.024)
				Cost-strategy	-0.158**
					(0.076)
4.00	No	No	Yes	Innovation Strategy	0.003
					(0.030)
				Cost-strategy	-0.179*
					(0.094)
5.00	Yes	No	Yes	Innovation Strategy	0.059**
					(0.027)
				Cost-strategy	-0.159*
					(0.085)
6.00	No	Yes	Yes	Innovation Strategy	0.072
					(0.059)
				Cost-strategy	-0.227
					(0.185)
7.00	Yes	Yes	Yes	Innovation Strategy	0.133***
					(0.137)
				Cost-strategy	-0.250**
					(0.110)
Controls					YES
N					983
-2LL					3513.748
Model Chi-square					238.211***
Nagelkerke R2					0.220

a. Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. b The reference category is 0 (Incr.training =No, Incr. layoffs = No, Incr. Hiring= No).

Table 8 Multinomial Logit Regression Output[a] - Category 1 as the reference category[b]

Dependent variable					HC-responses[b]
Category	Incr. Training	Incr. Layoffs	Incr. Hiring	Ind. Variables	
0.00	No	No	No	Innovation Strategy	-0.028
					(0.023)
				Cost-strategy	0.028
					(0.074)
2.00	No	Yes	No	Innovation Strategy	-0.028
					(0.028)
				Cost-strategy	0.154*
					(0.093)
3.00	Yes	Yes	No	Innovation Strategy	0.045*
					(0.024)
				Cost-strategy	-0.130*
					(0.074)
4.00	No	No	Yes	Innovation Strategy	-0.025
					(0.030)
				Cost-strategy	-0.151
					(0.093)
5.00	Yes	No	Yes	Innovation Strategy	0.031
					(0.027)
				Cost-strategy	-0.131
					(0.084)
6.00	No	Yes	Yes	Innovation Strategy	0.044
					(0.059)
				Cost-strategy	-0.200
					(0.184)
7.00	Yes	Yes	Yes	Innovation Strategy	0.105***
					(0.037)
				Cost-strategy	-0.223**
					(0.109)
Controls					YES
N					983
-2LL					3513.748
Model Chi-square					238.211
Nagelkerke R2					0.220

a. Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. b The reference category is 1 (Incr.training =Yes, Incr. layoffs = No, Incr. Hiring= No).

Table 9 Multinomial Logit Regression Output[a] - Category 2 as the reference variable[b]

Dependent variable					HC-responses[b]
Category	Incr. Training	Incr. Layoffs	Incr. Hiring	Ind. Variables	
0.00	No	No	No	Innovation Strategy	0.000
					(0.029)
				Cost-strategy	-0.127
					(0.094)
1.00	Yes	No	No	Innovation Strategy	0.028
					(0.029)
				Cost-strategy	-0.154
					(0.093)
3.00	Yes	Yes	No	Innovation Strategy	0.072**
					(0.029)
				Cost-strategy	-0.284***
					(0.092)
4.00	No	No	Yes	Innovation Strategy	0.003
					(0.035)
				Cost-strategy	-0.305***
					(0.111)
5.00	Yes	No	Yes	Innovation Strategy	0.059*
					(0.032)
				Cost-strategy	-0.285***
					(0.104)
6.00	No	Yes	Yes	Innovation Strategy	0.072
					(0.061)
				Cost-strategy	-0.354*
					(0.193)
7.00	Yes	Yes	Yes	Innovation Strategy	0.133***
					(0.041)
				Cost-strategy	-0.377***
					(0.123)
Controls					YES
N					983
-2LL					3513.748
Model Chi-square					238.211
Nagelkerke R2					0.220

a. Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. b The reference category is 2 (Incr.training =No, Incr. layoffs = Yes, Incr. Hiring= No).

Table 10 Multinomial Logit Regression Output[a] - Category 4 as the reference category[b]

Dependent variable					HC-responses[b]
Category	Incr. Training	Incr. Layoffs	Incr. Hiring	Ind. Variables	
0.00	No	No	No	Innovation Strategy	-0.003
					(0.030)
				Cost-strategy	0.179*
					(0.094)
1.00	No	No	No	Innovation Strategy	0.025
					(0.030)
				Cost-strategy	0.151
					(0.093)
2.00	No	Yes	No	Innovation Strategy	-0.003
					(0.035)
				Cost-strategy	0.305***
					(0.111)
3.00	Yes	Yes	No	Innovation Strategy	0.069**
					(0.031)
				Cost-strategy	0.021
					(0.095)
5.00	Yes	No	Yes	Innovation Strategy	0.056*
					(0.032)
				Cost-strategy	0.020
					(0.101)
6.00	No	Yes	Yes	Innovation Strategy	0.069
					(0.062)
				Cost-strategy	-0.049
					(0.193)
7.00	Yes	Yes	Yes	Innovation Strategy	0.130***
					(0.041)
				Cost-strategy	-0.072
					(0.123)
Controls					YES
N					983
-2LL					3513.748
Model Chi-square					238.211
Nagelkerke R2					0.220

a. Standard errors in parantheses. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. b The reference category is 4 (Incr.training =No, Incr. layoffs = No Incr. Hiring= Yes).

PUBLICATIONS WITHIN SNF'S RESEARCH PROGRAMME "CRISIS, RESTRUCTURING AND GROWTH"

2010-

Eirik S. Knudsen Lasse B. Lien	*Innovation, human capital and exogenous shocks* SNF Working Paper No 33/13
Eva Benedicte Norman *Victor D. Norman*	*Ett Nordfjord? Virkninger for arbeidsmarkedet og verdiskapning av E39 gjennom Nordfjord* SNF Report 06/13
Roger Drange Olav Andreas E. Heggheim	*Kvantitative lettelser og norsk bankfinansiering* *Hvordan påvirker kvantitative lettelser i USA, eurosonen og Storbritannia norske bankers finansiering?* SNF Working Paper No 12/13
Margrethe Andersen	*Norges Banks utlånsundersøkelse blant ikke-finansielle foretak: Ledende indikator for Kredittindikatoren K2? En empirisk analyse av Norges Banks utlånsundersøkelse blant ikke-finansielle foretak, rentekanalen, kredittkanalen og Kredittindikatoren K2* SNF Report No 04/13
Bård Støve Dag Tjøstheim	*Measuring asymmetries in financial returns: An Empirical Investigation Using Local Gaussian Correlation* SNF Working Paper No 12/13
Eirik S. Knudsen	*Darwin, recessions and firms: an evolutionary perspective on Firms in Recessions* SNF Working Paper No 05/13
Eirik S. Knudsen Kirsten Foss	*The effect of recessions on firms' boundaries* SNF Working Paper No 04/13
Eirik S. Knudsen Lasse B. Lien	*Investments in recessions* SNF Working Paper No 03/13
Øyvind Steira	*How accurate are individual forecasters? An assessment of the Survey of Professional Forecasters* SNF Working Paper No 51/12
Karen Oftedal Eikill	*Are individual forecasters rational? A study of inflation expectations using forecasts from the Survey of Professional Forecasters* SNF Working Paper No 50/12
Silje M. Hanstad Tone Aamli Sundtjønn	*Pensjonssystem i Kina - En analyse med en numerisk overlappende generasjonsmodell* SNF Working Paper No 49/12

Lene Eia Bollestad
Kristin Hommedal

Hvordan påvirkes reallønnen av makroøkonomiske faktorer og næringstilhørighet?
En empirisk analyse av norske lønnsdata for sivilingeniører og siviløkonomer i perioden 1986-3009
SNF Working Paper No 48/12

Kari-Dorte Krogsrud
Linda Sætre

Valutaeksponering og norsk industridød
En empirisk studie av sysselsetting i Telemark og Møre og Romsdal
SNF Working Paper No 47/12

Ragnhild Bjørkli
Marte Ruud Sandberg

Recessions and the short-term stability of the relative economic performance between firms
SNF Working Paper No 46/12

Ann Mari Fjelltveit
Ingrid Humlung

Hvor stabilt er prestasjonsnivået til norske bedrifter under nedgangstider?
En empirisk studie av effekten av nedgangstidene på 2000-tallet
SNF Working Paper No 45/12

Pernille M. Kvaslerud
Nora B. Henriksen

Konkursprediksjon gjennom ulike konjunkturfaser
En studie om hvordan en empirisk konkursprediksjons-Modell endrer seg gjennom ulike konjunkturfaser, i tids-Perioden 2001 til 2009
SNF Working Paper No 44/12

Marcus Selart
Svein T. Johansen
Synnøve Nesse

Employee evaluation of leader-initiated crisis preparation
SNF Working Paper No 35/12

Eirik S. Knudsen
Lasse B. Lien

Knowledge investments in recessions: The effects of demand and credit
SNF Working Paper No 34/12

Per Heum
Eva Benedicte Norman
Victor D. Norman
Linda Orvedal

Tørrskodd Vestland - Arbeidsmarkedsvirkninger av ferjefritt samband Bergen-Stavanger
SNF Working Paper No 33/12

Ingvild Almås
Gro Mæle Liane
Øystein Thøgersen

Fra kinesernes sparing til global vekst
Magma #0612

Gernot Doppelhofer

Finanskriser – hva vet vi?
Magma #0612

Ove Rein Hetland
Aksel Mjøs

For mye eller for lite lån? Betydningen av banker i oppgangs- og nedgangstider
Magma #0612

Lasse B. Lien Eirik S. Knudsen	*Norske bedrifter gjennom krisen: En oversikt* Magma #0612
Jarle Møen Kjell Gunnar Salvanes Helge S. Thorsen	*Har kvaliteten på lærerne falt over tid?* Magma #0612
Victor D. Norman	*Omstillingskrisen* Magma #0612
Inge Thorsen	*Lokaliseringsvirkninger av investeringer i transportnettet* Magma #0612
Geir Drage Berentsen Bård Støve Dag Tjøstheim Tommy Nordbø	*Recognizing and visualizing copulas: an approach using local Gaussian approximation* SNF Working Paper No 12/12
Siri Sollid Robstad Ingvild Almås	*Modernisert men urettferdig folketrygd?* SNF Working Paper No 04/12
Per Heum	*Hvordan vurdere godheten i næringspolitiske virkemidler?* SNF Working Paper No 03/12
Øystein Thøgersen	*Pengepolitikkens evolusjon* SNF Working Paper No 36/11
Guttorm Schjelderup	*Sekretessejurisdiksjoner, korrupsjon og økonomisk kriminalitet* SNF Working Paper No 33/11
Lasse B. Lien Tore Hillestad	*Recession, HR and change* SNF Working Paper No 20/11
Eirik S. Knudsen	*Shadow of trouble: The effect of pre-recession characteristics on the severity of recession impact* SNF Working Paper No 19/11
Bård Støve Dag Tjøstheim Karl Ove Hufthammer	*Using local Gaussian correlation in a nonlinear re-examination of financial contagion* SNF Working Paper No 14/11
Armando J. Garcia Pires Tom Stephan Jensen	*Effects of flat tax reforms on economic growth in the OECD countries* SNF Working Paper No 12/11
Kirsten Foss	*How do economic crises impact firm boundaries?* European Management Review, Vol. 7, No. 4, pp. 217-227, 2010

Kjell G. Nyborg
Per Östberg

Liquidity, ideas and the financial crisis
SNF Working Paper No 17/10

Lasse B. Lien

Recessions across industries: a survey
SNF Working Paper No 16/10

Ingvild Almås
Gernot Doppelhofer
Jens Chr. Haatvedt
Jan Tore Klovland
Krisztina Molnar
Øystein Thøgersen

Crisis, restructuring and growth: A macroeconomic perspective
SNF Report No 05/10

Strategic entrepreneurship is about the simultaneous exploitation of existing advantages and the creation and exploitation of new opportunities. These are often referred to as the strategy- and the entrepreneurship dimension, respectively. We examine how the relative emphasis on the two dimensions of strategic entrepreneurship affects how firms behave with respect to human capital in the context of one particular exogenous shock, namely recessions. We hypothesize and find that the higher the focus on the entrepreneurial dimension, the more firms invest in training, the more likely they are to hire, and the more likely they are to lay off employees. Finally, we also find that these firms are more likely to combine the accumulation of human capital through training with both hiring and firing.

In sum, these findings show how challenges and opportunities created by environmental change differ depending on the relative emphasis on the two dimensions. They also show how firms focusing on the entrepreneurial dimension more actively pursue the opportunities created by increased labor market imperfections in recessions. These results contribute to the literature by highlighting how recessions affect firms' flow of human capital investments, and subsequently stocks, depending on their weighting of the two dimensions of strategic entrepreneurship.

SNF
Et selskap i NHH-miljøet

SAMFUNNS- OG NÆRINGSLIVSFORSKNING AS

Institute for Research in Economics and Business Administration

Helleveien 30
N-5045 Bergen
Norway
Phone: (+47) 55 95 95 00
E-mail: snf@snf.no
Internet: http://www.snf.no/

Trykk: Allkopi Bergen