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- Labor Protection Laws and
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Abstract

The research is conducted to find empirical evidence of labor laws impact on cash holdings for Norwegian firms in the timespan between 1998 and 2013. Further, it relates the main research with factors such as firm size, grade of labor-intensity and CEO gender to explain the findings. We use account-data to run panel data regressions with FE, and find that cash holdings increase with 6.82% for big sized labor-intensive firms when labor laws become strict. The results supports previous research by Serfling (2013) conducted in the US. The findings also contradict evidence from US regarding determinants of cash holdings, while complementing findings in Europe and hence suggest a degree of homogeneity among firms in Europe.

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2. Introduction

Bates, Kahle and Stulz (2009) documents a huge rise of corporate cash holding for US firms, and cash is a major factor in corporations capital structure. As we have encountered in all of the macro courses at BI, a firm's output, put simply, is determined by capital and labor multiplied by a constant (level of technology). A higher level of cash holdings reduces the firm's investments and lowers the level of capital in production. In general equilibrium theory firms can reduce and increase their labor force as they see fit, and hence do not need to take into account the effect on the labor force of getting laid off. But in the real world labor unions and labor protection laws reduces a firm's power to easily get rid of unwanted labor. Although economic determinants are vastly researched, there is next to no empirical evidence available on labor laws affecting cash holdings.

Serfling (2013) investigates labor adjustment costs and capital structure, and finds evidence of a positive relationship between cash holdings and labor protection laws in the US industry. Scarce research on the topic, and lack of empirical evidence from Norway, motivated us to conduct the study and provide evidence for the following question.

Research question:

How does flexibility of labor contracts affect corporate cash holding?

The research is conducted on private and public Norwegian firms for the timespan between 1998 and 2013, using panel data regressions with FE (fixed effects). Labor law weights have been used to inspect whether a change impacts cash holdings. We found significant evidence of a positive relationship between labor laws strengthening and cash holdings for mid to big sized firm. The cash holdings increased by 6.82% for firms with fixed assets above NOK 20 million following an increase in temporary contract legislations.

These findings support work by Serfling (2013), and adds to the vast literature available on corporate capital structure in industrialized countries. The thesis

offers insights on labor laws as a determinant of cash holdings, and provides economically and statistically significant evidence. Since no such evidence is found in previous work on Norwegian firms, we believe the study will be a useful tool for firms in Norway and business schools researching corporate cash holdings. The thesis can also prove to be useful for new entrants whom wish to establish in Norway (mainly labor intensive firms) as they can include the conclusions drawn in their background research and forecasting.

The remaining thesis is organized in sections. Section I discuss the background and literature review, followed by theory and hypotheses development. Section II describes and summarizes the data and the methodological process along with the regressions. Section III contains the empirical results, linkage to previous literature and robustness tests. Finally, the study is concluded in section IV, and limitations of the thesis are discussed. Section V shows the reference list and the appendix containing all the tables and regression results.

3. Background and literature review

The issue of cash holdings is an important factor in corporate finance and determining the optimal capital structure. Even though there is a high level of heterogeneity among firms, finding empirical evidences of the different determinants of cash holdings for successful firms can help researchers and new startups. Hence, the issue is widely researched and we had access to vast literature.

Several papers related to our subject conclude that capital markets and agency problems typically determine capital structure decisions. There have been many research papers since Modigliani and Miller (1958) argued that the firm's value is independent of their capital structure decisions¹. Finance theories typically focus on capital structure decisions as function of tax advantage of debt and financial distress such as bankruptcy costs (Jensen and Meckling (1976), Miller (1977) and

¹ The basic theorem states that in the absence of taxes, bankruptcy costs, agency costs and assymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed. https://en.wikipedia.org/wiki/Modigliani%E2%80%93Miller_theorem

Myers (1984)). While those research papers have partially explained factors that impact capital structure decision, there are still aspects of financing decisions that has not been fully explored and remain a puzzle. Recently there have been a lot of researchers investigating different aspect that impact capital structure, which has hugely contributed to the literature.

An empirical paper by Gao, Harford and Li (2013) discusses a large comparison done in the US market between private and public firms regarding cash holdings. According to their findings public firms on average holds double the amount of cash as private firms, even though they are generally more diversified. Authors argue that the high number of cash held within the firm is due to the agency costs. They also discuss that cash holdings in public firms have been increasing significantly in recent years, approximately 20.5% in 2011². Furthermore, they found evidence of higher cash holdings when investor protection protocols and laws where weak. This is an interesting aspect that we will study through our thesis. Several other research papers discuss financing costs, agency costs and level of investor protection as a determinant for cash holdings. We are taking another path, and focusing on examining the impact of changes in labor law on firms' cash holdings.

There are also other factors that could have significant impact on cash holdings. For instance, a paper by Fritz Foley et al. (2007) shows that tax costs impacts US firms decisions to hold significant amounts of cash in their balance sheets. The authors developed and tested several hypotheses to examine how US multinational firms responds to tax costs associated with foreign income, and how that impact the level of cash. Authors also emphasize transaction costs and how firms face difficulties due to higher repatriation taxes. In the paper they also indicate that taxes have significant effects on the cash holdings. Therefore, multinational firms that have domestic and foreign operations with repatriation tax burdens tend to increase their cash held abroad significantly. This indicates that affiliates in countries with low tax rates are likely to hold more cash than other

² Based on all public US firms listed on the NYSE, Amex and Nasdaq in 2011. Gao, Harford and Li (2013) Page 623

affiliates within the same conglomerate. This is an interesting aspect for our study, as we will examine how companies respond to changes in regulations regarding cash holdings.

An article by Klasa, Maxwell and Ortiz-Molina (2009) provides evidence of firms in industries with strong labor unions holding smaller amounts of cash to increase their bargaining power. They discuss that the idea of holding low reserves of cash is to make a more credible case when arguing that risk of low liquidity threatens the firm's competitiveness and hence it cannot meet the union's demands.

Prior work by Mikkelsen and Partch (2003) indicates that firms' with high level of cash holdings enjoys the benefit of being able to fully invest in growth opportunities. Hence, a direct consequence of the cash holding versus bargaining power tradeoff strategy is that the firm has less cash available to fully invest in new projects with high growth opportunities. The article also shows a positive correlation between increased cash holdings and higher probability of strikes for unionized firms.

In United States, as well as other industrialized countries, regulations are designed to provide employees greater protection. These labor protection laws makes it more difficult for firms to discharge their employees and also more costly. These types of protection laws force firms to increase their "labor adjustment costs". A survey by Chubb (2012)³ shows that 46% of public firms are facing potential litigations and financial losses related to the violation of these labor laws. This increases the likelihood of costly lawsuits, which has significant impact on firms' capital structure.

A working paper by Serfling (2013) investigates the labor market frictions as a determinant of capital structure decision in the USA. This is closely related research to our study, and could be used in comparison studies in the future. The study investigates how costs associated with dismissing employees' increases when labor protection laws are passed and adopted by a state and how that impacts a firm's capital structure. Furthermore, the author also found that the

³ <http://www.chubb.com/businesses/csi/chubb15930.pdf> page: 16 accessed: 03.04.2016

firm's optimal amount of debt financing decreases when it faces higher labor adjustment costs. The paper finds empirical evidence of an increase in cash holdings for firms by approximately 13%⁴ when a new set of employment protection laws are adopted by the state they are located.

Acharya, Baghai and Subramanian (2012) discusses that when employees do not have any protection from unjust dismissals, they have less incentives to invest their human capital with the firm. This could impact negatively on firms' debt financing capability, which decreases their future debt capacity. Serfling (2013), however, argues that his paper could be subject to reverse causality⁵. If firms experience a decline in debt capacity, they will lobby for passage of labor laws in order to incentivize workers to invest their human capital with the firm. If the argument is true, Serfling (2013) claims that there would be a trend of declining financial leverage before the process of passing legislation.

In addition to the vast literature based on the US, an article by Ferreira and Vilela (2004) discusses determinants of cash holdings in EMU⁶ countries. Corporations hold a significant 15% of total assets in cash or cash equivalent⁷. Among other results, the authors find a negative relationship between cash holdings, firm size and bank debt.

An article in *Journal of Banking & Finance* by Hamid Boustanifar (2014) discusses the impact of credit market development on employment in the US. The author found that reforms on employment had a substantially higher impact in industries with higher labor intensity, based on authors own intensity weights. Even though the paper is based on banking reforms, it contains useful analyses and tables that could prove to be useful for our study.

⁴ Serfling (2013) page: 32

⁵ Allowing an effect to occur before it's cause

⁶ European monetary union

⁷ Datastream listing for EMU corporations at the end of year 2000

4. Theoretical framework

When labor laws become strict, firms cannot hire temporary workers or fire them as easily as before. As related literature shows, firms keep more cash to reduce the probability of bankruptcy in case of recessions or a decline in revenue. Therefore, we expect that more flexible labor laws (in favor of employees) should increase corporate cash holding and could be attributable to increase in human capital. Bates, Kahle and Stulz (2009) lists up four reasons behind a firm's decision for cash holdings.

4.1. The transaction motive

In line with classical finance models, an optimal amount of cash must be held as firms incur transaction costs and have to pay their liabilities. Transaction cost motive suggests existence of economies of scale, which indicates that bigger firms hold less cash relative to total assets.

4.2. The precautionary motive

Quite obviously, reasonable firms hold cash as a precautionary measure to cope with recessions. Among others, a paper by Opler et al. (1999) show that the amount of precautionary cash holdings increase with costlier access to capital markets and risky cash flows. This motive also indicates that firms with better investment opportunities tend to hold more cash as adverse shocks and financial distress is more costly for them. Riddick and Whited (2009) shows a positive relationship between a firm's exposure towards risk and its cash holdings.

4.3. The tax motive

Firms must hold a certain amount of cash to be able to pay any outstanding tax within the due dates. Fritz Foley et al. (2007) show that US firms repatriating foreign earnings holds higher levels of cash, as earnings are taxable. Hence, multinational firms have higher level of cash holdings than their national counterparts.

4.4. The agency motive

Jensen (1986) argues that entrenched managers would rather hold excess cash than to increase payouts to shareholder in case of poor investment opportunities. Dittmar, Mahrt-Smith and Servaes (2003) doing cross-country research found evidence of higher cash holdings in countries with higher agency problems. Hence, agency problems are positively correlated with corporate cash holdings. Further, research by Harford, Mansi and Maxwell (2008) suggest that entrenched managers tend to build up excess cash balances and also spend them relatively quick. Hence, the excess cash does not provide much security.

The interesting part valid for our research question is the precautionary motive, as we discuss the effect of an exogenous factor, labor laws, on corporate cash holdings. Reading up on relevant articles and using the acquired knowledge from being students at BI for half a decade, we are able to conclude that any reasonable entity (company) will try to manage its exposure towards risk factors. Labor protection laws are not a risk factor in particular; on the contrary the strength of these laws will give employees a feeling of insurance and safety. However, in time of distress and financial crisis the strength of these contracts could potentially mean businesses going belly-up.

Based on equilibrium macroeconomic models, a company hires and fires staff according to productivity and demand. But when labor laws and contracts are involved in the process, a company cannot simply lay off employees at all or without a form for compensation. The strength of the labor laws determines the level of power between a firm and the staff. A reasonable owner/manager would take into account wage and fixed expenses that must be paid in all states of the economy. Hence, the firm must keep a certain level of liquid assets (cash or short term government bonds) to be able to meet the required payments in time of distress. These arguments lay the basis for our hypotheses development later in the section.

4.5. Tradeoff theory

In order to determine an optimal capital structure, tradeoff theory was introduced based on the work by Modigliani and Miller (1963). This theorem takes market imperfection factors such as cost of financing debt, bankruptcy, agency costs and taxes as determinants of cash holdings. Kraus and Litzberger (1973) discuss the advantages of debt financing to obtain tax shield benefit, and the leveraging disadvantages. Further, Ozkan and Ozkan (2004) argues that an increase in leverage significantly increases the probability of financial distress. Higher debt can have both positive and negative impact on the cash holdings. When firm's debt-to-equity ratio increases, marginal benefits of tax reaches an optimal point. Tax shield effects are therefore not so prevalent. The theory argues there are other factors that need to be included when determining the optimal level of debt for the firm, such as growth opportunities, company size, interest rate, profitability and market conditions.

A working paper by Faulkender (2002) researching market imperfections impact on small firms argues that greater leverage leads to higher cash levels. He also points out that cash holdings increases with company age and decreases with size.

4.6. Research and Development investment

Companies that use a substantial amount of their capital for R&D purposes will increase their cash holdings in the periods researching and development phases are conducted. If the amounts are distributed ex-ante, it is likely that additional financing, through debt and equity, is difficult to acquire or not provided at all. If the firm were close to a breakthrough, it would be disadvantageous to quit the research. Hence, firms will increase their cash holdings in the given periods to have a buffer in case of a breach. Bates, Kahle and Stulz (2009) argue that firms hold higher cash holdings to avoid constantly having to obtain funds externally, which is costly.

4.7. Labor law

In addition to the vast theory regarding cash holdings, next follow a necessary background explanation of the predictor variable in the study, namely employment protection laws. The International Labor Organization (ILO), established in 1919, was developed to provide a system of international labor standards. It was done in order to protect some particular issues, for instance providing workingwomen with maternity protection, or ensuring safe working conditions for agricultural workers. The aim was to give women and men opportunities to obtain decent and productive labor, regulated according to freedom, equity, security and dignity. By creating an international standard required representatives from several parties such as, governments, workers, and employers. Hence, the ILO has been in a developing state for many years, as new representatives have entered along the years.

Today, the International Labor Office is responsible for preparing a report that analyzes laws and practices in countries. In order for ILO to adopt a new standard, two-third majority of votes by conference participants is required. Furthermore, ILO member are required to submit any convention adopted at the International Labor Conference to the respective competent department for new legislations or changes. Since we are in a globalized economy, international labor standards has huge impact and are an essential component in the international framework for ensuring that the growth of the global economy provides benefits to all parts.

4.8. Labor Union Laws

The congress passed the National Labor Relations (NLRA) act in 1935, with the intention to encourage a more stable and healthy relationship between workers and their employers in the private sector. Intuitively, employers were not obligated to recognize a union, but by establishing a union gives employees' basic rights to join and opportunity to engage in collective bargaining. Furthermore, Congress also hoped that the union could help to reduce the work stoppages, strikes and other conflicts that may arise between labor and management that had often occurred violently. The National Labor Relations Board (NLRB) was

created in order to enforce the NLRA act. Most importantly, the NLRA allowed unions to represent employees according to the law (Silverman (2007)).

The LO (landsorganisasjonen), established in 1899, is the largest labor union organization in Norway and plays a major role in enforcing existing legislations and push for better worker welfare. The LO has close to a million members in 25 different sector unions, hence being a powerful union (Nergaard (2014) and Kristiansen (2016)).

4.9. Bargaining power against labor unions

In studies by Klasa, Maxwell and Ortiz-Molina (2009) a firm's industry unionization rate is used as a primary proxy to examine whether the firm is likely to bargain with a powerful union that represents a large number of the firm's employees. They were aiming to examine the importance of gaining bargaining power over labor unions, and also to test the negative relation between unionization and corporate cash holdings. The research concludes that there is in fact a negative relationship between labor unions and cash holdings.

Firm size and percentage of unionized workers is typically correlated. Hence, bigger firms are more impacted by the changes in protection laws due to the collective power of unions to force the adoption of these laws. This contradicts findings by Miles (2000), suggesting that firms with unionized workers are less affected by changes in labor laws. Matsa (2010) argues that firms use more financial leverage in the presences of organized labor. The idea is to put pressure on the cash flow, and thereby get a tougher stance when bargaining with the unions. The increased leverage will in turn result in greater cash holdings, as the debt was not raised for investment reasons initially.

5. Hypotheses

Bearing in mind the theory and past research and after discussions with our supervisor, we have developed a set of hypotheses to be tested. We will formally test the hypotheses using both continuous and discrete predictor variables.

5.1. Hypothesis 1

When labor laws strengthen, the corporation will increase its cash holding.

This is to have a buffer in case of lower demand for firm's products or financial distress. The cash would be used to compensate laid off staff and pay wages to retained staff in the wait for the economy to recover. Cash holdings are also used to pay legal expenses in case of lawsuits and to pay penalties if the firm loses the case. Acharya, Almeida and Campello (2007) claims that constrained firms with high hedging needs increases their cash holdings using cash flow instead of decreasing the debt.

5.2. Hypothesis 2

If labor laws affect corporate cash holdings; the impact will be greater for enterprises within highly labor-intensive industries.

This hypothesis is related to the first, and suggests that the protection laws will have a greater impact on firms that depend more on labor than for regular firms.

5.3. Hypothesis 3

Firms with a female CEO will increase the cash holdings more than the average, in case of labor laws strengthening.

Research by Palvia, Vähämaa and Vähämaa (2015) and Emilia and Sami (2010) conducted on US businesses suggests that female CEOs tend to be more conservative and risk-averse than their male counterparts. They will therefore hold a bigger buffer in case of recesses and other negative impacts.

5.4. Hypothesis 4

Changes in labor protection laws will have a significant and greater impact on mid- to big sized firms, relative to smaller firms.

Opler et al (1999) discusses the impacts of firm size on capital structure and cash holdings. It is reasonable to expect that big sized firms, employing higher number of workers and holding more cash, will be more affected by the changes in employment protection contracts and laws.

6. DATA

6.1. Gathering and cleaning

We had access to several academic articles related to our thesis, which are excessively discussed in the previous section. For the explicit data gathering, to be able to do an empirical study, we accessed the databases given below.

STATA⁸ have been an extremely useful tool for our study, as we used it for every research aspect from summaries to regressions. We have also taken advantage of the easy user interface of Microsoft Excel to store and edit summary tables and regression results.

6.2. CCGR database

The main source we used is the CCGR (Center for Corporate Governance Research) database, which holds the accounting data for the universe of firms in Norway from 1990s and up till present. The CCGR is quality controlled by BI's Department of Finance with devices such as a commitment to publish in reputable academic journals, close interaction with Norwegian businesses and regulators and a policy of publishing the findings to the general public through media. Hence, we can be confident that the available data is accurate and legitimate. All of our variables are book values, since we are using account data.

From the database we obtained standardized accounting data for the universe of Norwegian firms from 1994 to 2013. Although the data is supposed to be free of major anomalies, we had to do a thorough cleaning, as we were working with 27 variables and more than 3.5 million observations.

We have used 15-year period from 1998 till 2013, and dropped the data from previous years. This particular period is used because we have full data available

⁸ Statistical software

from both the CCGR and OECD⁹ database. The period also covers two major shocks in the world economy (2000-dot.com bubble and 2008-world financial crisis), and it is reasonable to include a couple of years before and after the shock to get a robust dataset. In addition, we eliminated any enterprises that had reported less than five years of accounting data, for the sake of robustness.

In order to obtain a more consistent data we only kept private and public limited companies in our study. Firms in the financial- and utility-sector are also dropped. Financial firms are excluded because they need to hold cash for statutory capital requirements, and their business model includes holding inventory of marketable securities as cash. Utilities are also dropped on the basis of their cash-holdings regarding regulatory supervision. Not surprisingly, a dataset of such magnitude had a lot of missing observations over the years for the enterprise variables. Hence, we dropped the non-existing observations for the respective variables important for our research.

Furthermore, we include a set of limitations so the sample would be more fit for our purpose. We dropped firms with negative operating income and/or revenues. Firms with total fixed assets below NOK 2 million were omitted, along with firms that had a negative R&D (research and development). We have also filtered out firms aged less than five years so the changes we study can be visible. The accounting data on number of employees have missing entries, so we had to combine it with SSB data and used Stata's max operator to get the right number of employees listed to avoid double entries. Companies employing less than five workers were dropped as well. Hence, we excluded smaller firms whom generally consist of family members or friends. Failing to omit these variables would surely have given us spurious regressions.

The dependent variable, cash, also needed a set of restrictions in order to be correctly used in the study. Firstly, negative and zero cash values were omitted to generate log of cash. Secondly, every observation where cash was higher than total fixed asset was dropped to get the right cash/assets-ratio (between 0 and 1).

⁹ OECD dataset is explicitly describe in the next section below

Some additional limitation and elimination was done after checking for outliers and non-existing variables using summary statistics and data browsing. In the end, we were satisfied with having 15 years of clean data for 11 679 Norwegian firms, adding up to a total of 75 824 observations.

6.3. OECD database

Labor protections laws data was obtained from the OECD database (Organization for Economic Co-operation and Development). The OECD is an organization for economically developed countries such as Norway, promotes economic and social welfare, and is a frontrunner for transparency and integrity. The database consists of a set of indicators compiled by using the Secretariat's own readings of statutory laws, collective bargaining agreements and case law as well as contributions from officials from member countries and advices from country experts. Hence, it is a secure data-mining source for our thesis.

The dataset was clean and ready to be used without further checking. OECD has a weighting system for the level of strictness of employment protection laws for a given year for each member country. The weights change once a year (if any change occurs) and report the force of protection laws at January 1st each year. The weight increases when a country passes or strengthens existing or additional employment protection laws.

Our sample has a range from 1985 till 2013, and each indicator is compiled by a set of items with different weightings. These items are important factors for employees, such as notification procedures, severance pay, reinstatement and use of fixed-term contracts. As we approach the latest data, the list of items used to generate the indicators increases. Hence, the data from 2008 and onwards, consisting of up to 13 detailed items, is the most detailed and accurate. We used this subsample of five years to run additional regressions to check the robustness of our result.

OECD dataset consists of summary indicators for individual and collective dismissals for employees holding regular contracts as well as strictness of employment protections for temporary contracts. Each subgroup has one or more versions, with the 3rd version being compiled by the maximum number of items. Not surprisingly, the strictness of labor protection for regular employees in Norway has not changed during the given time frame. Norway, being a wealthy industrialized country saw major changes after the Second World War and onward till early 70's with the discovery of oil on the Norwegian continental shelf. We did, however, find changes in the indicators for temporary contracts around the 2000-year millennia and once again in 2005. This is the subgroup we have used for our research. An additional regression was run on a subsample using the 3rd version of the employment protection laws, which are from the timespan between 2008 and 2013.

6.4. SSB

The SSB (Central bureau of statistics) database has also been excessively used in the paper. The department is regulated by law of statistics and governed by the Norwegian Ministry of Finance, and offers a deep insight into the Norwegian society, economy and the labor market.

We obtained the industry-codes for Norwegian enterprises from CCGR, and used the SSB's NACE¹⁰(Nomenclature statistique des activités économiques dans la Communauté européenne) database to identify the specific industries. The NACE database is a classification tool for economic activity in the European community, developed for Norway in 1994, and revised in 2002 and 2007.

The NACE database categorizes economic activity in 21 major sectors (alphabetically from A to U) such as agriculture, industry, transport, utilities and health. Then each subgroup within the sectors are given a unique numerical five-digit identification, which is the number we matched with the CCGR industry-

¹⁰ SSB NACE database, accessed the database during 1st to 10th of July 2016.
<http://stabas.ssb.no/ClassificationFrames.asp?ID=342101&Language=nb>

codes. Although the data from CCGR is clean, the industry-codes had to be checked thoroughly as some of them were classified using the 1994 version and others using 2007 version. The identification process was extremely time consuming¹¹ and we made extensive use of the Brønnøysund¹² registers to check for enterprises with ambiguous classifications.

The classification process was done so we would be able to assign specific labor intensity weights to the different industry-sectors.

6.5. Boustanifar's paper

A paper written by Professor Hamid Boustanifar¹³ discussing finance and employment has been used to assign the intensity weights. The researcher discusses various aspects of the American economy, and in the process assigns labor-intensity weights to the sectors. Intensity is constructed by dividing wage bill to value added for 32 industries in each state of the US in 1980, and then the median is used as the level of intensity for the country as a whole. The weights range between 0 and 1, with 1 being the most labor intensive.

Even though there are huge differences between the Norwegian and American economy considering factors such as size, history, culture and climate, there is a presence of similarities between western industrialized countries considering the level of technology and the way businesses are conducted and operated.¹⁴ After discussions with the author and online research, we concluded that the weights given to American industries could be applied to Norwegian industries without modifications.

¹¹ The dataset is a useful tool for students researching on the same topics. Future research can be based on the thoroughly classified data.

¹² An agency governed by the Norwegian Ministry of Industry and fishery, housing firm specific data

¹³ Finance and employment: Evidence from U.S. banking reforms, Journal of Banking & Finance, Boustanifar Hamid, 2014

¹⁴ Matching between Norway and USA is much more accurate than for example India, a developing country with low degree of technology.

Combining the intensity weights with CCGR and NACE databases, we were able to generate the labor-intensity variable for each sector in the Norwegian economy¹⁵. Lastly, we generated a variable organizing the labor-intensity weights in groups. This is done in order to run regressions with industry fixed effects.

6.6. Descriptive & summary statistics

Detailed summary statistics for the main variables is presented in table 1 along with a descriptive section. Each variable is assigned to a row, and the different columns represent statistical measures such as number of observations, mean, standard deviation, maximum, minimum and median. Next we have included a correlation matrix for the aforementioned variables.

Table. 1 Summery statistics for the main variables

<i>Dependent</i>	N	Mean	SD	Max	Min	Median
Cash	75824	8398228	7.95e+07	1.16e+10	1000	1493000
Incash	75824	14.16803	1.717495	23.17496	6.907755	14.2163
Cash_assets	75824	.2614548	.2575356	1	4.75e-07	.1679584
<i>Dummies</i>	N	Mean	SD	Max	Min	Median
Gender	75824	.9167282	.2762944	1	0	1
Intensity	75824	.4314729	.495285	1	0	0
<i>Tools</i>	N	Mean	SD	Max	Min	Median
EPT v1	75824	2,920134	0,116568	3	2,75	3
EPT v3	34495	3.097889	.1335485	3.417	3.042	3.042
Labintensity	75824	.6437454	.1321965	.908	.0995	.641
Indgroups	75824	13.40838	6.328868	30	1	13
<i>Independent</i>	N	Mean	SD	Max	Min	Median

¹⁵ Enterprises that failed to be classified in a sector and/or had missing sector-data were dropped from the sample. This is done to prevent spurious regressions.

Law*int	75824	1.879773	.3935499	2.724	.273625	1.91675
Law*int*gen	75824	1.720797	.6421864	2.724	0	1.842
Int*gen	75824	.5896209	.2186427	.908	0	.641
Law*gen	75824	2.675634	.8141739	3	0	3
Law*highint	75824	1.260722	1.449175	3	0	0
Law(v3)*highint	34495	1.374769	1.542694	3.417	0	0
<i>Controls</i>	N	Mean	SD	Max	Min	Median
ROA	75824	8.12737	9.666185	177.09	0	3,87
Ln(Asset)	75824	16.2675	1.429627	25.9903	14.50866	15.90242
Liab/Asset	75824	.5607784	.6382402	34.22638	0	.5213779
R&D	75824	.0354406	.1311861	1	0	0

Summary statistics table present the variables for 11679 private and public Norwegian firms between 1998 and 2013. All the numbers are book values. Variables are the following: Lncash (the natural logarithm of cash), cash_asset (the cash to total fixed asset ratio), Gender (dummy takes the value of 1 if male CEO, and 0 otherwise), intensity (dummy takes value of 1 for firms with above median labor intensity (0.641)), EPT v1 and v3(two versions of temporary employment law weights), labintensity (the labor intensity weights for Norwegian firms), indgroups (labor intensity weights classified in 30 industry groups). Independent variables are two-way and three-way interactions between labor laws, intensity (dummy) and gender dummy. Control variables: ROA (return on assets), LnAssets (natural logarithm of assets), Liab/assets (long term debt to fixed assets ratio) and R&D (research and development to fixed assets ratio).

6.7. Dependent variables

The cash variable was used to generate the dependent variables, log of cash and cash asset-ratio (cash/fixed assets). It is necessary to get the dependent variables in continuous form in order to be able to study the impact of the exogenous factors. An increase in the variables is simply interpreted as a positive effect given a certain level of significance.

6.8. Independent variables

We have included a set of continuous and discrete independent variables, generated by combining the aforementioned databases. Labor-intensity weights, employment protections law (EPT) weights, dummy for CEO gender and dummy for the above median labor-intensity have been used to generate the exogenous variables. Grouping at industry-level is used to run a regression on industry fixed effects. The independent variables are generated for the full 15-year sample and a 5-year sample (2008-2013), using the 3rd version of EPT. We have also generated

the same variables for a sample of big and small firms (above and under the median of fixed assets, respectively).

- EPT * labor intensity weight

This is the main continuous variable valid for the whole sample. Mean and median is almost equal; hence the variable has normal distribution characteristics slightly skewing to the left.

- EPT (v.1) * labor intensity * CEO gender-dummy
- Labor intensity * gender-dummy
- EPT * gender-dummy

To check for the 3rd hypothesis, we include the dummy for CEO gender. This variable is also continuous with normal distribution characteristics (slightly skewed to left). Since it is a three-way interaction (A*B*C), we had to include A*B (EPT*labor-intensity), B*C and A*C along with the three variables independently to run the regression.

- EPT * high labor-intensity-dummy

Using labor-intensity, we generated a dummy for firms belonging to highly labor-intensive industries. The dummy takes the value of 1 when a firm has a labor-intensity weight above the median and 0 otherwise. This variable is not only generated to confirm our hypothesis, but is also used as the discrete variable in the study. We do this in order to get rid of the noise that follows continuous independent variables, which in turn can give insignificant results. We have used this discrete variable to run the same regressions as we did with the continuous mentioned above.

6.9. Control variables

Four theoretically relevant control variables (CVs) are used to avoid omitted variables bias. There exists empirical evidence of the impact of these variables on the corporate cash holdings in the background literature. The CVs are not directly related to our research but have been included to control for effects not covered by

the fixed effects such as time-variant effects. Hence, we include control variables in order to get a more precise estimation of the predictor variable's true effect.

ROA (return on assets) is a proxy for profitability and internal equity while *log of fixed assets* control for the firm size. Both variables are commonly used in leverage and other capital regressions (Harris and Raviv (1991)).

Debt-ratio (long term liabilities/fixed assets) controls for enterprises use of leverage and is previously used by Gao, Harford and Li (2013) and Klasa, Maxwell and Ortiz-Molina (2009). Highly leveraged firms may have to hold higher level of cash to act as a buffer in recessions, and omitting this variable may give us spurious results.

R&D (research and development/fixed assets) is included to control for level of cash, and is regularly used by Opler et al. (1999) and Klasa, Maxwell and Ortiz-Molina (2009). There are empirical evidences of increased cash levels for firms that have a high R&D budget, in order to cope with over expenditures.

6.10. Correlation matrix

Table 2 shows the correlation coefficients for the above-mentioned variables. Every coefficient, significant at 0.05 alpha levels, is marked with a star. Examining the matrix, we can see some obvious results. The log of cash is positively correlated with the other dependent variable, cash/asset-ratio, and with the log of assets. This is aligned with economic theory, as assets and cash increase proportionally. Another factor in favor of the theory is significant negative correlation between cash/asset-ratio and the log of assets, explaining that increased assets decrease the ratio. Ln(cash) and Ln(assets) are also highly correlated.

Other significant coefficients appear for the independent variables generated by multiplying the EPT weights with intensity weights and dummies. Not surprisingly, the variables are highly correlated, because they are made up by the same source. We can see almost perfect correlation, as high as 99% and 80%, for

these variables. The discrete independent variable, using intensity dummy, does also correlate positively with the other independent variables. Even though multicollinearity is detected, it does not affect our results since we are only using one independent variable in each regression. The high correlation between the main dependent variable and the three-way interaction variable, based on the CEO gender, suggests that our hypothesis about conservative female CEO's may be incorrect.

There is no significant correlation detected between the control variables, hence they were included in the regressions without worrying about over fitting. The same applies for correlation between the independent and control variables.

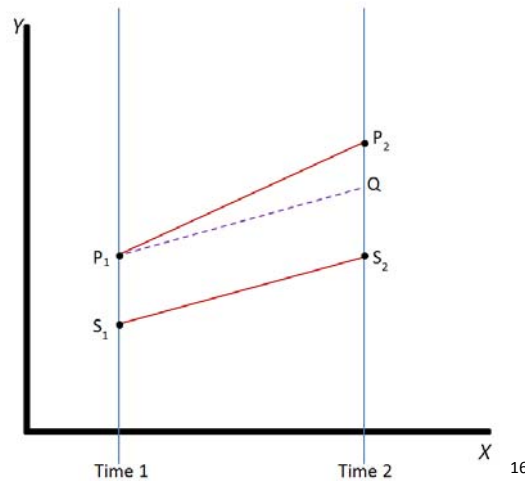
Table 2

The correlation matrix consists of the variables explained in the summary statistics above. Variables are the following: Lncash (the natural logarithm of cash), cash_asset (the cash to total fixed asset ratio), Gender (dummy takes the value of 1 if male CEO, and 0 otherwise), intensity (dummy takes value of 1 for firms with above median labor intensity (0.641)), EPT v1 and v3 (two versions of temporary employment law weights), labintensity (the labor intensity weights for Norwegian firms), indgroups (labor intensity weights classified in 30 industry groups). Independent variables are two-way and three-way interactions between labor laws, intensity (dummy) and gender dummy. Control variables: ROA (return on assets), LnAssets (natural logarithm of assets), Liab/assets (long term debt to fixed assets ratio) and R&D (research and development to fixed assets ratio). The star (*) denotes statistical significance at 5% alpha level.

<i>Correlations</i>	Cash	Ln(Cash)	Cash/asset	law*int	law*int*gen	int*gen	law*gen	law*highint	ROA	Ln(asset)	Liab/asset	R&D
Cash	1.0000											
Ln(cash)	0.2525*	1.0000										
Cash/asset	0.0430*	0.5075*	1.0000									
law*int	-0.0190*	0.0101*	0.0687*	1.0000								
law*int*gen	-0.0197*	0.0067	0.0217*	0.5494*	1.0000							
int*gen	-0.0215*	-0.0013	0.0177*	0.5317*	0.9934*	1.0000						
law*gen	-0.0118*	0.0126*	-0.0149*	0.0019	0.8147*	0.8043*	1.0000					
law*highint	-0.0171*	-0.0019	0.0599*	0.6952*	0.4020*	0.3990*	0.0182*	1.0000				
ROA	0.0070	0.0260*	0.1253*	-0.0710*	-0.0005	0.0387*	-0.0037	-0.0222*	1.0000			
Ln(asset)	0.2543*	0.4972*	-0.2599*	-0.0939*	-0.0254*	-0.0332*	0.0438*	-0.0850*	-0.0998*	1.0000		
Liab/asset	-0.0281*	-0.1188*	-0.0665*	0.0103*	0.0048	0.0094*	-0.0054	-0.0041	-0.0518*	-0.1130*	1.0000	
R&D	0.0376*	0.0997*	-0.0061	-0.1143*	-0.0663*	-0.0666*	-0.0035	-0.0768*	-0.0026	0.1429*	-0.0310*	1.0000

7. Methodology

The study have been conducted using the difference-in-differences (DID) research design, which is used to examine the influence of an exogenous (un)observable event (passage of labor-laws) on individuals or enterprises in a time-series. The individual is examined pre and post the event to determine whether it had any influence, taking the time invariant trend into consideration. The impact, if any, is the distance between P_2 and Q .



The dataset is categorized as panel data since the account-data of enterprises is observed across time. This method allowed us to control for variables changing over time but not across firms, such as regulations and policies, and to include control variables (Wikipedia (2016b) and Sosa-Escudero (2016)). Hence, it takes into account the individual heterogeneity. Next step was to determine whether to use fixed effects (FE) or random effects (RE) regression, which is usually done by running the Hausman's test. It is simply done by running both FE and RE regressions, and check for correlation between the time-invariant characteristics with the Hausman's test, using $H_0 = \text{RE}$ (correlation) and $H_A = \text{FE}$ (non-correlation). In our case, however, the theory along with past research and

¹⁶ By Danni Ruthvan - Own work, CC BY-SA 3.0,
<https://commons.wikimedia.org/w/index.php?curid=33320554>

discussions with our supervisor led to the conclusion that a FE regression is the correct fit.

FE regression removes the effect of the time-invariant variables (geography, culture or climate), so we do not have to worry about omitted time-invariant variable bias (Wikipedia (2016a)). FE assumes each firm has its own individual characteristics that may influence the predictor variables, and that they are unique and not correlated with other individuals characteristics. Since each firm is different, their error terms and the constant should not be correlated.¹⁷ The error terms are assumed to vary non-stochastically over time and firms, which implies a non-random walk (Torres-Reyna (2007)).

We have run the regressions with firm FE and industry FE, both alongside year FE. The firm FE controls for time-invariant omitted firm characteristics, ensuring that estimates for β reflect real changes, while the industry FE does the same for sector-specifics. The year FE controls for nation-wide macroeconomic conditions that may affect the economy as a whole¹⁸. Using Stata is very convenient in the process as it will automatically create dummies for all but one of the firm or industry categories as well as for the year category and then run the fixed effects regression (Best (2015) and Blumenstock (2016)).

Before using the software to run the regressions, we had to set Stata to handle the dataset as panel data using `xtset` (firm/industry and time) command. Now, everything is correctly setup and we are ready to test our hypotheses. We have used the linear regression command `xtreg` in Stata to conduct our study. This command fits regression models to panel data, with FE option.

7.1. Regressions

$$\text{Log(Cash)}_{i,t} = \alpha + \beta(\text{EPT} * \text{labor-intensity})_{i,t} + \beta \log(\text{assets})_{i,t} + \beta \text{ROA}_{i,t} + \beta \text{debt-ratio}_{i,t} + \beta \text{R\&D-ratio}_{i,t} + v_i + w_t + \varepsilon_{i,t}$$

¹⁷ Oscar Torres-Reyna, Princeton University, 2007, Powerpoint slides on Panel data, FE and Stata. <https://www.princeton.edu/~otorres/Panel101.pdf> accessed: 10.08.16

¹⁸ Serfling laborlaws 2013

$$\text{Cash/asset-ratio}_{i,t} = \alpha + \beta(\text{EPT}*\text{labor-intensity})_{i,t} + \beta\log(\text{assets})_{i,t} + \beta\text{ROA}_{i,t} + \beta\text{debt-ratio}_{i,t} + \beta\text{R\&D-ratio}_{i,t} + v_i + w_t + \varepsilon_{i,t}$$

The main regressions of our study are written above. They are valid for both the continuous independent variables and the discrete (using high-intensity dummy instead of labor-intensity weights). We are able to answer our main research questions with the regressions and test the additional firm size hypothesis. We test the hypotheses by analyzing the β of each variable and check if it is significant at a given alpha level. (Stock (2015)) has been used to correct the general methodology in the study).

The log of cash and cash-assets ratio is the dependent variables, while the EPT*labor-intensity is the independent variable. Next in the regression follows the inclusion of the control variables. We have run the initial regression with only the predictor variable, and then included one control variable in the next, two CVs in the third and so on until all four CVs are present. The α denotes the intercept (constant), β is the measurement of the effect an independent or control variable have on the endogenous variable and ε is the error term. The subscript i denotes a specific firm (or industry) while t denotes time (year). Only the variables that change over time and firms have both subscripts, otherwise only the appropriate subscript is assigned. The v and w denotes firm (or industry) and year FE, respectively.

$$\begin{aligned} \text{Log(Cash)}_{i,t} \text{ or } \text{Cash/asset-ratio}_{i,t} = & \alpha + \beta(\text{EPT}*\text{labor-intensity}*\text{gender-} \\ & \text{dummy})_{i,t} + \beta(\text{EPT}*\text{labor-intensity}^*)_{i,t} + \beta(\text{EPT}*\text{gender-dummy})_{i,t} + \beta(\text{labor-} \\ & \text{intensity}*\text{gender-dummy})_{i,t} + \beta(\text{EPT})_t + \beta(\text{labor-intensity})_t + \\ & \beta(\text{gender-dummy})_{i,t} + \beta\log(\text{assets})_{i,t} + \beta\text{ROA}_{i,t} + \beta\text{debt-ratio}_{i,t} + \beta\text{R\&D-ratio}_{i,t} + v_i \\ & + w_t + \varepsilon_{i,t} \end{aligned}$$

To test the hypothesis of female CEOs being more conservative than their male counterparts, we have modified the two-way interaction regression into a three-way interaction consisting of seven ($A*B*C + A*B + A*C + C*B + A + B + C$) exogenous variables. Every variable in the regression have a firm and time subscript except for α , v, w and some predictor variables. EPT is only denoted

with a time subscript as the law is constant over firms and only varies over time. The labor-intensity variable is only denoted with an i since it is assumed to be constant over time and only vary across firms (or industries).

7.2. Robustness test

7.2.1. Clustering at industry level

The estimated standard errors are corrected with clustering at industry level to check for a set of statistical anomalies not removed by firm FE, such as serial correlation. The clustering method accounts for potential time varying correlations in unobserved factors that may affect different firms within the same industries (Bertrand, Duflo and Mullainathan (2004)). It also corrects for within firm error term correlations, hence it is more general than firm-level clustering. Since the firms are not nested within clusters, we included the `nonest` command. This option makes it possible to cluster the standard errors across panels.

In order to use FE models, we assume strict exogeneity. Endogeneity problems occur when the predictor variable is correlated with the error term. In our case, however, we do not encounter such an issue as strengthening of labor laws is strictly an exogenous event with respect to corporate capital structure and cash holdings. Such a problem would indicate a probable trend and would invalidate the DID approach¹⁹ (Gormley (2016)).

7.2.2. Sample selection

In addition to statistical robustness, we check for the robustness of labor-law weights. The aforementioned regressions are run on a five-year sample (2008-2013) using the 3rd version of EPT. The weights in the 3rd version include 13 items in contrast to only 8 items used in the 1st version, therefore being more detailed and accurate. Getting a significant result for the subsample will give our research additional explanatory power.

¹⁹ Serfling, 2013, labor adjustment costs & capital structure

Another robustness test will be conducted when we run the regressions on small and big firms' data. If the main hypothesis is confirmed, the results should be more significant for big firms according to the firm size hypothesis.

8. Empirical Results and findings

The results in the tables are presented with the coefficients in percentage for the logarithmic variables and in absolute value for the ratio variables, and their respective p-values. We do, however, report our findings in percentage for both dependent variables²⁰. A low p-value indicates that we can reject the null hypothesis, stating that the coefficient is zero and hence do not have any effect on the dependent variable. Clustering at industry level is done to check the robustness of each regression. The regressions tables related to our research are included in the appendix while the main table confirming the hypotheses is included in this section.

8.1. Continuous independent variable

Table 1 shows the regressions results for the full sample data (1998-2013) with firm and year FE. The level of cash increased by 5.96% following the strengthening of labor laws, but the coefficient is only statistically significant at alpha level of 10% and excluding the CVs (control variables). Hence, due to low statistical significance and omitted variable bias we cannot reject the null hypothesis. The cash-asset ratio reported in table 2 is even less significant, and the regressions do not hold any explanatory power. This problem was expected, as continuous predictor variables may fail in these types of settings¹. Since the simple regression failed to confirm our hypotheses, we dropped the continuous predictor in additional testing.

²⁰ The percentage of cash-asset ratio is calculated as such: (coefficient / constant) * 100

8.2. Discrete independent variable

The regressions are run with firm and year FE on the full sample data, and uses the EPT*high intensity dummy (discrete) as the predictor. Table 3 shows that cash holdings increases by 2.46%, with a statistical significance of 1% excluding the CVs, when we are dealing with highly labor-intensive firms. Both the economic and statistical significance decreases when the CVs are included, resulting in a cash increase of 1.63% at an alpha level of 10%. The coefficient is only significant at 10% excluding CVs, when we cluster at industry level as shown in table 4. The statistical significance of the result is too weak to confirm our hypotheses.

Same regressions are run with industry FE, and the results in table 5 shows economically and statistically significant coefficients. Cash holdings decrease by 17.6% (alpha level of 5% and CVs included) due to labor law changes. This results shows that using the industry FE, categorized by labor intensity weights, are a bad fit for our study as there is a great deal of heterogeneity present. Bearing in mind the two crises (dot.com bubble and world financial crisis) occurring in the sample period, the negative coefficients could be due to omitted variables. Clustering at industry level shows no significant coefficients.

The cash-asset ratios, shown in table 6, increases by 0.135% (5% level) and 0.118% (10% level) when including a single CV (log assets) and four CVs, respectively. After clustering in table 7, only the first result remains significant at 10% alpha level.

8.3. Mid to big firm size sample

Table 8 presents the results of the firm and year FE regressions run on firms with above median (approx. NOK 8.06 million) fixed assets. Cash holdings increase by almost 4% with a p-value of 1%. The economic and statistical significance is a bit reduced when we include the CVs, but the model still yields a result of 3.23% increase at a 5% level. Hence, we can reject the null hypothesis (coefficient is zero), and conclude that the coefficient does hold explanatory power and confirms several of our hypotheses.

The cash-asset ratio as dependent variable in table 9 confirms the above-mentioned results, and shows a 0.323% increase in the ratio due to labor law changes. The result includes all four CVs and is significant at 1% level. Clustering at industry level in table 10 yields the same significant result.

The mid to big firm size sample with high labor-intensity shows that labor law strengthening, do in fact, impact firms' cash holdings. We hypothesized that labor laws strengthening would result in increased cash levels (H1), and the effect would be greater for bigger sized firms (H4) in highly labor-intensive industries (H2). The result confirms our hypothesis and supports the conclusion drawn by Serfling (2013), even though the economic significance is much lower⁴. The main reason behind the different result is the magnitude of labor laws strength. As the evidence from US is based on states adopting new legislations, we test for smaller additions in an already established legislation. This is also in support of our theory stating that large sized firms, employing unionized workers, are more affected, hence contradicting the results from US by Miles (2000). The result also complement the conclusions drawn by Riddick and Whited (2009), stating that risk factors lead to increased cash holdings.

The regressions show that the CVs are significant at an alpha level of 1% throughout the tests, and have a positive impact on cash holdings. Ln(assets) have a positive coefficient, showing that firm size is positively related to cash holdings. This is in favor of previous findings by Ozkan and Ozkan (2004) and Ferreira and Vilela (2004), but contradicts evidence from US presented by Opler et al. (1999) and Miles (2000). The positive relation between ROA and cash supports the argument by Ozkan and Ozkan (2004) regarding profitability. Further the leverage ratio have a significant impact on the cash levels, supporting findings by Faulkender (2002), but contradicting the work by Opler et al. (1999), Ferreira and Vilela (2004) and Ozkan and Ozkan (2004). The results indirectly complement work by Matsa (2010) regarding leverage and bargaining with labor unions. Since leverage increases cash holdings, the reason behind leverage increase could be to get a tougher stance when bargaining with unions instead of investment purposes.

Furthermore, R&D is positively related to cash holdings, showing support for the argument of investing in growth by Mikkelson and Partch (2003)

CVs show the same impact on cash-asset ratio, except for a negative relation between cash ratio and log of assets, complementing the empirical evidence from Opler et al. (1999) and Miles (2000). The result is also reasonable just by eyeballing, as a decrease in assets would increase the cash to assets ratio.

8.4. Big firm size sample

Although we had a cut off point for fixed assets at NOK 2 million, we understand it was set to low after examining the results. Hence, we modeled additional regressions on big sized firms (fixed assets above NOK 20 million). Firm and year FE regressions modeled on log of cash shows that cash holdings increases with 6.82% with a significance level of 1% after including the CVs in table 11, while clustering at industry level decreases the statistical significance to 5% shown in table 12.

Table 11
Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for big sized (assets above NOK 20 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *lncash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) A1 lncash	(2) A2 lncash	(3) A3 lncash	(4) A4 lncash	(5) A5 lncash
law_highint	0.0729*** (0.0222)	0.0730*** (0.0221)	0.0692*** (0.0220)	0.0679*** (0.0220)	0.0682*** (0.0220)
lnassets		0.361*** (0.0262)	0.394*** (0.0263)	0.396*** (0.0263)	0.395*** (0.0263)
roa			0.0177*** (0.00165)	0.0180*** (0.00165)	0.0182*** (0.00165)
ltliab_assets				0.155*** (0.0253)	0.154*** (0.0253)
r_d					0.222* (0.115)
Constant	15.16*** (0.0494)	8.703*** (0.471)	7.909*** (0.476)	7.788*** (0.475)	7.801*** (0.475)
Observations	20,460	20,460	20,460	20,460	20,460
R-squared	0.007	0.018	0.024	0.027	0.027
Number of cid	3,731	3,731	3,731	3,731	3,731
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The cash-assets ratio in table 13 increases by 0.743% with firm and year FE after including the CVs, and yields the same economically and statistically significant result when clustering at industry level in table 14. In addition to firm FE, regressions with industry and year FE shows an increase of 5% in cash to asset ratio at 5% significance in table 15. This result implies some degree of homogeneity among big sized firms in labor-intensive industries. Clustering at industry level does not reduce the significance of the results, hence we can confirm hypothesis 4.

This result further strengthens our previous hypotheses confirmation, and also validates the hypothesis regarding firm size. The impact is much higher for firms with assets above NOK 20 million, providing support for Serfling (2013). His sample contains publicly traded US firms, indicating large asset volumes, and we obtained a more significant result using big sized firms. Our full sample included firms with assets equaling NOK 2 million, and such small firms typically only employ regular workers who stay with them for a long time. Hence, changes in labor laws for temporary employment do not have any impact on these firms. These results contradicts the transaction motive claims by Bates, Kahle and Stulz (2009) suggesting that big firms hold less cash with respect to the economies of scale argument.

Equivalent regressions modeled on small firms further increased the confirmation of hypothesis 4, as we did not get any significant result using firm and year FE as shown in table 16. As stated in the previous paragraph, firms with fixed assets below NOK 8 million (or even a few millions higher) are simply too small to experience any impact of the labor protection laws.

8.5. Five year sample

Table 17 shows the result for the aforementioned regressions run on a five-year sample (2008-2013) and using the 3rd version of EPT. The tests did not yield any significant results. The idea was to check the robustness of our results as 3rd

version EPT weights contains additional items, but unfortunately the time span also covered the worldwide financial crisis. The impact of the crisis has been too severe on firms' capital structures and cash holdings to see any difference made by labor law changes. In addition, the regression is run on the whole sample including small firms. This further reduces the significance of any result.

CEO gender

Table 18 shows the firm and year FE regressions modeled on the three-way interaction variable. The results are not statistically significant, and we cannot reject the null hypothesis. Hence, we fail to confirm the 2nd hypothesis, stating that female CEOs' are more risk averse and conservative than their male counterparts regarding cash holdings and labor laws. This could be due to several reasons, among which the cultural differences and way of conducting business in Norway and USA stands out. Another explanation could be that labor law changes in particular affect the CEOs without any regard for gender. Additionally, our sample data shows that only 9% of the CEOs in the study are females, and such a small and widespread group does not have a significant impact by itself. The result neither confirms, nor opposes, findings by Palvia, Vähämaa and Vähämaa (2015) and Emilia and Sami (2010) from the US.

9. Conclusion

We examined the cash holdings, among other account-data variables, for 11,679 Norwegian firms to find any relationship with employment protection laws. The research was done on several subsamples with a set of restrictions to get the ideal setting. The study found empirical evidence of a positive impact on cash holdings related to changes in temporary employment laws. The result was most significant for firms with assets above NOK 20 million, located in highly labor-intensive industries. Our research support the finding by Serfling (2013) from US, and complement conclusions drawn by previous empirical literature regarding determinants of cash holdings. However, the study could not find any evidence of conservative female CEO's, as argued by Palvia, Vähämaa and Vähämaa (2015) and Emilia and Sami (2010).

The sources for the research are elite databases and high quality articles. Hence, the study is highly relevant and precise, and the findings can be used in comparison studies and in educational purposes as a relevance point. We also believe that policymakers would find the research interesting and useful, as it adds to the list of consequences regarding changes in labor legislations.

The thesis has a set of limitations, as the result is only significant for a small number of private and public firms in Norway. The numbers are book values, which could indicate a certain level of bias in the study. Although the data was regarded clean, we encountered a lot of missing values, a typical phenomenon when dealing with so many firms and years. The sample was not detailed enough to test for the conservative claim regarding CEO gender.

The thesis has found several new topics to be researched in the future. Firstly, the whole study could be done using market values to see if the conclusions match. There can also be conducted an entire study on labor intensity weights for Norwegian industries. An explicit study would increase the homogeneity within sectors, and make it possible to run industry FE. Finally, comparison studies can be done relating Norway with Scandinavia, Europe and ultimately the US. We could find contradicting results regarding leverage and cash in US (Opler et al. (1999)) and Europe (Faulkender (2002)), and such a study could shed additional light on the similarities and differences in industrialized countries.

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11. Appendix

Industry	Labor intensity
Agriculture, forestry, and fishing	0,0995
Tobacco products	0,402
Petroleum and coal products	0,419
Legal services	0,434
Personal services	0,492
Mining	0,501
Transportation and public utilities	0,518
Wholesale trade	0,563
Hotels and other lodging places	0,579
Business services	0,614
Lumber and wood products	0,631
Chemicals and allied products	0,633
Retail trade	0,641
Food and kindred products	0,697
Construction	0,701
Paper and allied products	0,716
Primary metal industries	0,742
Printing and publishing	0,745
Industrial machinery and equipment	0,749
Stone, clay, and glass products	0,756
Fabricated metal products	0,756
Miscellaneous manufacturing	0,756
Leather and leather products	0,758
Health services	0,767
Electronic and other electric equipment	0,780
Instruments and related products	0,786
Rubber and misc. plastics products	0,808
Furniture and fixtures	0,817
Textile mill products	0,832
Apparel and other textile products	0,854
Motor vehicles and equipment	0,878
Educational services	0,908

Labor intensity is constructed by, first, dividing wage bill to value added for each 32

Industries at each state in year 1980. This gives a measure of labor intensity for each

industry at each state. Then, labor intensity for each industry is constructed as the median of labor intensity for that industry across all states. The raw data are from BEA.

Employment protection summary indicators

Country	Year	Individual and collective dismissals			Individual dismissals		Collective dismissals	Temporary employment	
		eprc_v1	eprc_v2	eprc_v3	epr_v1	epr_v3	epc	ept_v1	ept_v3
NOR	1998	2.333	2.381		2.333		2.500	3.188	
NOR	1999	2.333	2.381		2.333		2.500	3.188	
NOR	2000	2.333	2.381		2.333		2.500	3.000	
NOR	2001	2.333	2.381		2.333		2.500	2.750	
NOR	2002	2.333	2.381		2.333		2.500	2.750	
NOR	2003	2.333	2.381		2.333		2.500	2.750	
NOR	2004	2.333	2.381		2.333		2.500	2.750	
NOR	2005	2.333	2.381		2.333		2.500	2.750	
NOR	2006	2.333	2.381		2.333		2.500	3.000	
NOR	2007	2.333	2.381		2.333		2.500	3.000	
NOR	2008	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.042
NOR	2009	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.042
NOR	2010	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.042
NOR	2011	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.042
NOR	2012	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.042
NOR	2013	2.333	2.381	2.310	2.333	2.233	2.500	3.000	3.417
Min		2.333	2.381	2.310	2.333	2.233	2.500	2.750	3.042
Max		2.333	2.381	2.310	2.333	2.233	2.500	3.188	3.417

Regression results

Table 1

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *lncash* is the natural logarithm of cash. The predictor variable *laborlaw_intensity* is a two-way interaction between employment protection laws (1st version) weight labor-intensity weight. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) lncash	(2) lncash	(3) lncash	(4) lncash	(5) lncash
laborlaw_intensity	0.0596* (0.0335)	0.0453 (0.0333)	0.0369 (0.0331)	0.0364 (0.0331)	0.0372 (0.0331)
lnassets		0.308*** (0.00966)	0.338*** (0.00968)	0.341*** (0.00969)	0.338*** (0.00971)
roa			0.0153*** (0.000617)	0.0155*** (0.000618)	0.0156*** (0.000618)
ltliab_assets				0.0550*** (0.00922)	0.0541*** (0.00922)
r_d					0.226*** (0.0539)
Constant	13.72** * (0.0667)	8.816*** (0.167)	8.175*** (0.168)	8.092*** (0.169)	8.124*** (0.169)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.034	0.049	0.058	0.058	0.059
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 2

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *laborlaw_intensity* is a two-way interaction between employment protection laws (1st version) weight and labor-intensity weight. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
laborlaw_intensity	-0.000497 (0.00607)	0.00561 (0.00580)	0.00417 (0.00577)	0.00413 (0.00577)	0.00426 (0.00577)
lnassets		-0.131*** (0.00168)	-0.126*** (0.00169)	-0.126*** (0.00169)	-0.127*** (0.00169)
roa			0.00263*** (0.000108)	0.00264*** (0.000108)	0.00265*** (0.000108)
ltliab_assets				0.00439*** (0.00161)	0.00425*** (0.00161)
r_d					0.0348*** (0.00939)
Constant	0.222*** (0.0121)	2.310*** (0.0291)	2.200*** (0.0293)	2.193*** (0.0294)	2.198*** (0.0295)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.010	0.096	0.104	0.104	0.104
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *Incash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) Incash	(2) Incash	(3) Incash	(4) Incash	(5) Incash
law_highint	0.0246*** (0.00911)	0.0195** (0.00904)	0.0161* (0.00900)	0.0159* (0.00900)	0.0163* (0.00900)
lnassets		0.308*** (0.00966)	0.337*** (0.00968)	0.341*** (0.00969)	0.338*** (0.00971)
roa			0.0153*** (0.000617)	0.0155*** (0.000618)	0.0156*** (0.000618)
ltliab_assets				0.0549*** (0.00922)	0.0540*** (0.00922)
r_d					0.227*** (0.0539)
Constant	13.80*** (0.0196)	8.882*** (0.155)	8.228*** (0.157)	8.145*** (0.157)	8.179*** (0.158)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.034	0.049	0.058	0.058	0.059
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *Incash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets. Standard errors are corrected with clustering at industry level.

VARIABLES	(1) Incash	(2) Incash	(3) Incash	(4) Incash	(5) Incash
law_highint	0.0246* (0.0126)	0.0195 (0.0120)	0.0161 (0.0121)	0.0159 (0.0121)	0.0163 (0.0121)
lnassets		0.308*** (0.0200)	0.337*** (0.0201)	0.341*** (0.0202)	0.338*** (0.0203)
roa			0.0153*** (0.000879)	0.0155*** (0.000892)	0.0156*** (0.000890)
ltliab_assets				0.0549*** (0.0168)	0.0540*** (0.0168)
r_d					0.227*** (0.0764)
Constant	13.80*** (0.0340)	8.882*** (0.310)	8.228*** (0.317)	8.145*** (0.320)	8.179*** (0.321)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.034	0.049	0.058	0.058	0.059
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster	YES	YES	YES	YES	YES

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 5

Log of cash and EPT

This table reports the results, from panel data regressions with industry and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *lncash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) lncash	(2) lncash	(3) lncash	(4) lncash	(5) lncash
law_highint	-0.205*** (0.0714)	-0.178** (0.0705)	-0.175** (0.0701)	-0.175** (0.0702)	-0.176** (0.0702)
lnassets		0.480*** (0.00644)	0.501*** (0.00640)	0.502*** (0.00640)	0.498*** (0.00642)
roa			0.0184*** (0.000591)	0.0184*** (0.000593)	0.0185*** (0.000593)
ltliab_assets				0.00615 (0.00841)	0.00542 (0.00841)
r_d					0.314*** (0.0468)
Constant	13.55*** (0.0656)	5.761*** (0.120)	5.201*** (0.120)	5.182*** (0.120)	5.212*** (0.120)
Observations	75,824	75,824	75,824	75,824	75,824
Number of cid	11,679	11,679	11,679	11,679	11,679
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 6

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Lliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.000938 (0.00165)	0.00312** (0.00158)	0.00254 (0.00157)	0.00253 (0.00157)	0.00259* (0.00157)
lnassets		-0.131*** (0.00168)	-0.126*** (0.00169)	-0.126*** (0.00169)	-0.127*** (0.00169)
roa			0.00262*** (0.000108)	0.00264*** (0.000108)	0.00265*** (0.000108)
lqliab_assets				0.00438*** (0.00161)	0.00424*** (0.00161)
r_d					0.0350*** (0.00939)
Constant	0.220*** (0.00354)	2.317*** (0.0271)	2.205*** (0.0273)	2.199*** (0.0274)	2.204*** (0.0275)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.010	0.096	0.104	0.104	0.104
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 7

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Lliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets. Standard errors are corrected with clustering at industry level.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.000938 (0.00176)	0.00312* (0.00172)	0.00254 (0.00170)	0.00253 (0.00170)	0.00259 (0.00170)
lnassets		-0.131*** (0.00358)	-0.126*** (0.00352)	-0.126*** (0.00353)	-0.127*** (0.00354)
roa			0.00262*** (0.000150)	0.00264*** (0.000150)	0.00265*** (0.000150)
ltliab_assets				0.00438* (0.00259)	0.00424 (0.00259)
r_d					0.0350*** (0.0120)
Constant	0.220*** (0.00446)	2.317*** (0.0564)	2.205*** (0.0556)	2.199*** (0.0559)	2.204*** (0.0559)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.010	0.096	0.104	0.104	0.104
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster	YES	YES	YES	YES	YES

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 8

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for mid- to big sized (assets above sample median (NOK 8.06 million)) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *lncash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) lncash	(2) lncash	(3) lncash	(4) lncash	(5) lncash
law_highint	0.0399*** (0.0149)	0.0371** (0.0148)	0.0322** (0.0147)	0.0321** (0.0147)	0.0323** (0.0147)
lnassets		0.338*** (0.0171)	0.375*** (0.0171)	0.376*** (0.0171)	0.374*** (0.0171)
roa			0.0190*** (0.00108)	0.0193*** (0.00108)	0.0194*** (0.00109)
ltliab_assets				0.112*** (0.0174)	0.110*** (0.0174)
r_d					0.242*** (0.0826)
Constant	14.56*** (0.0331)	8.803*** (0.292)	7.960*** (0.295)	7.877*** (0.295)	7.901*** (0.295)
Observations	37,914	37,914	37,914	37,914	37,914
R-squared	0.012	0.025	0.034	0.036	0.036
Number of cid	6,911	6,911	6,911	6,911	6,911
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 9

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for mid- to big sized (assets above sample median (NOK 8.06 million)) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.00594*** (0.00213)	0.00684*** (0.00206)	0.00616*** (0.00205)	0.00615*** (0.00205)	0.00617*** (0.00205)
lnassets		-0.109*** (0.00238)	-0.104*** (0.00238)	-0.104*** (0.00238)	-0.104*** (0.00239)
roa			0.00264*** (0.000151)	0.00267*** (0.000151)	0.00268*** (0.000151)
ltliab_assets				0.0104*** (0.00242)	0.0102*** (0.00242)
r_d					0.0331*** (0.0115)
Constant	0.180*** (0.00473)	2.034*** (0.0407)	1.917*** (0.0411)	1.909*** (0.0411)	1.912*** (0.0411)
Observations	37,914	37,914	37,914	37,914	37,914
R-squared	0.005	0.068	0.077	0.077	0.078
Number of cid	6,911	6,911	6,911	6,911	6,911
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 10

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for mid- to big sized (assets above sample median (NOK 8.06 million)) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets. Standard errors are corrected with clustering at industry level.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.00594*** (0.00222)	0.00684*** (0.00221)	0.00616*** (0.00223)	0.00615*** (0.00222)	0.00617*** (0.00222)
lnassets		-0.109*** (0.00473)	-0.104*** (0.00473)	-0.104*** (0.00472)	-0.104*** (0.00473)
roa			0.00264*** (0.000203)	0.00267*** (0.000203)	0.00268*** (0.000204)
ltliab_assets				0.0104** (0.00426)	0.0102** (0.00424)
r_d					0.0331** (0.0158)
Constant	0.180*** (0.00501)	2.034*** (0.0803)	1.917*** (0.0806)	1.909*** (0.0807)	1.912*** (0.0807)
Observations	37,914	37,914	37,914	37,914	37,914
R-squared	0.005	0.068	0.077	0.077	0.078
Number of cid	6,911	6,911	6,911	6,911	6,911
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster	YES	YES	YES	YES	YES

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 12

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for big sized (assets above NOK 20 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *Incash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets. Standard errors are corrected with clustering at industry level.

VARIABLES	(1) Incash	(2) Incash	(3) Incash	(4) Incash	(5) Incash
law_highint	0.0729** (0.0330)	0.0730** (0.0324)	0.0692** (0.0329)	0.0679** (0.0330)	0.0682** (0.0330)
lnassets		0.361*** (0.0481)	0.394*** (0.0487)	0.396*** (0.0483)	0.395*** (0.0485)
roa			0.0177*** (0.00195)	0.0180*** (0.00195)	0.0182*** (0.00195)
ltliab_assets				0.155*** (0.0461)	0.154*** (0.0458)
r_d					0.222 (0.166)
Constant	15.16*** (0.0785)	8.703*** (0.861)	7.909*** (0.882)	7.788*** (0.879)	7.801*** (0.880)
Observations	20,460	20,460	20,460	20,460	20,460
R-squared	0.007	0.018	0.024	0.027	0.027
Number of cid	3,731	3,731	3,731	3,731	3,731
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for big sized (assets above NOK 20 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.0134*** (0.00263)	0.0134*** (0.00256)	0.0129*** (0.00255)	0.0128*** (0.00255)	0.0128*** (0.00255)
lnassets		-0.0945*** (0.00304)	-0.0902*** (0.00304)	-0.0901*** (0.00304)	-0.0902*** (0.00304)
roa			0.00230*** (0.000190)	0.00233*** (0.000190)	0.00234*** (0.000191)
ltliab_assets				0.0118*** (0.00292)	0.0117*** (0.00292)
r_d					0.0240* (0.0133)
Constant	0.145*** (0.00585)	1.834*** (0.0546)	1.730*** (0.0550)	1.721*** (0.0550)	1.723*** (0.0550)
Observations	20,460	20,460	20,460	20,460	20,460
R-squared	0.004	0.059	0.067	0.068	0.068
Number of cid	3,731	3,731	3,731	3,731	3,731
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 14

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for big sized (assets above NOK 20 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets. Standard errors are corrected with clustering at industry level.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.0134*** (0.00258)	0.0134*** (0.00260)	0.0129*** (0.00264)	0.0128*** (0.00265)	0.0128*** (0.00265)
lnassets		-0.0945*** (0.00631)	-0.0902*** (0.00624)	-0.0901*** (0.00623)	-0.0902*** (0.00624)
roa			0.00230*** (0.000255)	0.00233*** (0.000255)	0.00234*** (0.000257)
ltliab_assets				0.0118** (0.00599)	0.0117** (0.00596)
r_d					0.0240 (0.0185)
Constant	0.145*** (0.00613)	1.834*** (0.113)	1.730*** (0.112)	1.721*** (0.112)	1.723*** (0.112)
Observations	20,460	20,460	20,460	20,460	20,460
R-squared	0.004	0.059	0.067	0.068	0.068
Number of cid	3,731	3,731	3,731	3,731	3,731
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster	YES	YES	YES	YES	YES

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 15

Cash-assets ratio and EPT

This table reports the results, from panel data regressions with industry and year FE, relating changes in corporate cash holdings to temporary employment legislations for big sized (assets above NOK 20 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *cash_assets* is cash holdings divided by total fixed assets. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) cash_assets	(2) cash_assets	(3) cash_assets	(4) cash_assets	(5) cash_assets
law_highint	0.0538** (0.0222)	0.0434** (0.0217)	0.0514** (0.0216)	0.0512** (0.0217)	0.0516** (0.0216)
lnassets		-0.0568*** (0.00202)	-0.0544*** (0.00201)	-0.0540*** (0.00200)	-0.0545*** (0.00200)
roa			0.00283*** (0.000183)	0.00283*** (0.000183)	0.00286*** (0.000183)
ltliab_assets				-0.00182 (0.00270)	-0.00203 (0.00270)
r_d					0.0501*** (0.0112)
Constant	0.0951*** (0.0141)	1.100*** (0.0384)	1.023*** (0.0384)	1.017*** (0.0383)	1.016*** (0.0383)
Observations	20,460	20,460	20,460	20,460	20,460
Number of cid	3,731	3,731	3,731	3,731	3,731
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 16

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for small sized (assets below NOK 8.06 million) Norwegian firms from 1998 to 2013. All the numbers are book values. The dependent variable *lncash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (1st version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) lncash	(2) lncash	(3) lncash	(4) lncash	(5) lncash
law_highint	0.00461 (0.0115)	0.00563 (0.0114)	0.00330 (0.0114)	0.00349 (0.0114)	0.00390 (0.0114)
lnassets		0.281*** (0.0186)	0.310*** (0.0186)	0.312*** (0.0186)	0.311*** (0.0187)
roa			0.0135*** (0.000721)	0.0136*** (0.000723)	0.0136*** (0.000723)
ltliab_assets				0.0227** (0.0113)	0.0223** (0.0113)
r_d					0.142* (0.0804)
Constant	13.12*** (0.0235)	8.868*** (0.283)	8.270*** (0.283)	8.216*** (0.285)	8.235*** (0.285)
Observations	37,914	37,914	37,914	37,914	37,914
R-squared	0.057	0.065	0.075	0.075	0.075
Number of cid	7,915	7,915	7,915	7,915	7,915
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 17

Log of cash and EPT version 3

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 2008 to 2013. All the numbers are book values. The dependent variable *Incash* is the natural logarithm of cash. The predictor variable *law_highint* is a two-way interaction between employment protection laws (3rd version) weight and a dummy for labor-intensity. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1) Incash	(2) Incash	(3) Incash	(4) Incash	(5) Incash
law_highint	0.00619 (0.0155)	0.00510 (0.0154)	0.00461 (0.0152)	0.00475 (0.0152)	0.00526 (0.0152)
lnassets		0.149*** (0.0181)	0.219*** (0.0181)	0.219*** (0.0181)	0.218*** (0.0181)
roa			0.252*** (0.00987)	0.262*** (0.0102)	0.262*** (0.0102)
ltliab_assets				-0.0597*** (0.0157)	-0.0600*** (0.0157)
r_d					0.194** (0.0791)
Constant	14.21*** (0.0237)	11.77*** (0.297)	10.24*** (0.299)	10.26*** (0.299)	10.28*** (0.299)
Observations	34,495	34,495	34,495	34,495	34,495
R-squared	0.005	0.008	0.032	0.033	0.033
Number of cid	9,097	9,097	9,097	9,097	9,097
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 18

Log of cash and EPT

This table reports the results, from panel data regressions with firm and year FE, relating changes in corporate cash holdings to temporary employment legislations for Norwegian firms from 1998 to 2013 and the CEO gender. All the numbers are book values. The dependent variable *Incash* is the natural logarithm of cash. The predictor variables are: *law_gen_highint* is a three-way interaction between employment protection laws (1st version) weight, a dummy for labor-intensity and gender dummy. The dummy takes the value of 1 when intensity in a firm is above the sample median (>0.641), and 0 otherwise. The gender dummy takes value of 1 when CEO is a male, and 0 otherwise. *gen_highint*, *law_highint* and *lablaw_gender* are two-way interactions between the above-mentioned variables. Lastly, the variables are also included separately. Model 1 is excluding control variables (CVs), and a total of four CVs are included one by one in models 2 to 5. *Lnassets* is the natural logarithm of fixed assets, *ROA* is the return on assets, *Ltliab_assets* is long-term liabilities divided by fixed assets and *r_d* is the research and development divided by fixed assets.

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Incash	Incash	Incash	Incash	Incash
<i>law_gen_highint</i>	0.301 (0.301)	0.296 (0.298)	0.346 (0.297)	0.356 (0.297)	0.367 (0.297)
<i>gen_highint</i>	-1.038 (0.887)	-1.009 (0.880)	-1.143 (0.875)	-1.176 (0.875)	-1.207 (0.875)
<i>law_highint</i>	-0.461 (0.291)	-0.442 (0.288)	-0.495* (0.287)	-0.506* (0.287)	-0.516* (0.287)
<i>lablaw_gender</i>	0.0770 (0.178)	-0.0457 (0.176)	-0.0276 (0.176)	-0.0400 (0.176)	-0.0470 (0.176)
<i>genderdummy</i>	-0.246 (0.523)	0.100 (0.519)	0.0457 (0.516)	0.0823 (0.516)	0.104 (0.516)
<i>highint_dummy</i>	1.575* (0.858)	1.489* (0.852)	1.625* (0.848)	1.658* (0.847)	1.689** (0.847)
<i>ept_v1</i>	-0.869*** (0.187)	-0.564*** (0.185)	-0.489*** (0.185)	-0.462** (0.185)	-0.456** (0.184)
<i>lnassets</i>		0.308*** (0.00966)	0.337*** (0.00969)	0.340*** (0.00970)	0.338*** (0.00972)
<i>roa</i>			0.0153*** (0.000617)	0.0155*** (0.000618)	0.0156*** (0.000618)
<i>ltliab_assets</i>				0.0552*** (0.00922)	0.0543*** (0.00922)
<i>r_d</i>					0.227*** (0.0539)
Constant	16.42*** (0.545)	10.62*** (0.571)	9.738*** (0.569)	9.576*** (0.570)	9.589*** (0.570)
Observations	75,824	75,824	75,824	75,824	75,824
R-squared	0.034	0.049	0.058	0.059	0.059
Number of cid	11,679	11,679	11,679	11,679	11,679
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
CEO gender	Male	Male	Male	Male	Male

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

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BI Norwegian Business School

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1.1 Introduction

Research question:

How does flexibility of labor contracts affect corporate cash holding?

Bates, Kahle and Stulz (JF2009) documents a huge rise of corporate cash holding for US firms. Several papers have studied the reason behind cash holdings for US firms and other economies. However, there is no evidence on how labor laws affect corporate cash holding. As we have encountered in all of the macro courses at BI, a firm's output, put simply, is determined by capital and labor multiplied by a constant (level of technology). A higher level of cash holdings reduces the firm's investments and lowers the level of capital in production. In general equilibrium theory firms can reduce and increase their labor force as they see fit, and hence do not need to take into account the affect on the labor force of getting laid off. But in the real world labor unions and labor protection laws reduces a firm's power to easily get rid of unwanted labor. In this thesis we will investigate how much of corporate cash holdings are due to changes in labor protection laws.

There is next to no research on this topic while corporate cash holdings have been widely researched and both theoretical and empirical papers on the subject are available. In addition the available papers are investigating the US and other major markets, while we are planning to investigate the Norwegian market and to some extent link it with US. We believe our thesis will be a useful tool for public firms in Norway and business schools (professors and students) researching corporate cash holdings as it will offer new insights and could be linked up to other factors affecting cash holdings. The thesis can also prove to be useful for new entrants whom wish to establish in Norway (mainly labor intensive firms) as they can include the research in their forecasts.

The fact that it is very little research available on the topic is highly motivational for us, as we have the opportunity to test a hypothesis that could very well be a main reason behind corporate cash holdings.

1.2 Literature review

As mentioned in the introduction, there is no specific research on the subject; however we have found some excellent papers on related questions. These are published in highly renowned journals, featuring on Financial Times top 45 list.

1.2.1 Determinants of corporate cash policy: Insights from private firms

An empirical paper published in 2013 in the Journal of Financial Economics by Gao, Harford and Li discusses a large comparison done in the US market regarding cash holdings of private and public firms. The paper is published in a highly renowned paper, and cited 8 times. However two of the authors Harford and Li, are cited over 6000 and 16000 times, respectively. These facts indicate a very insightful paper, which is yet to be discovered by the researching world.

The authors found that public firms on average holds double the amount of cash as private firms, even though public firms are generally more diversified. They argue that the high number of cash held is due to the occurring agency costs. Cash holdings in public firms have been increasing in recent years, and amounted to 20.45% in 2011. It was also found evidence of higher cash holdings when investor protection protocols and laws were weak. This is an interesting linkage we are planning to check thoroughly and use in our research. Financing costs, agency costs and level of investor protection are identified as the main determinants of public and private firms.

1.2.2 Why do firms hold so much cash? A tax-based explanation

A report published by Foley, Hartzell, Titman and Twite about why firms hold so much cash shows that US corporations tend to hold significant amounts of cash in their balance sheets. In the empirical paper they have developed and tested several hypotheses to examine the magnitude of US multinational cash holdings. Further, how that responds to tax costs associated with foreign income, and how firms facing higher repatriation taxes hold higher levels of cash.

The paper emphasizes transactions costs and how firms facing the difficulties associated with obtaining external finance. The paper also indicates that taxes have significant effects on the cash balances of US firms, where multinational firms would trigger for larger tax expenses by repatriating earnings tend to have higher consolidated cash holdings. Studies shows that firms that have domestic and foreign operations with repatriation tax burdens increase cash held abroad. It also indicate that affiliates in countries with low tax rates, and imply high tax costs of repatriating earnings are more likely to hold more cash than other affiliates of the same firm.

This paper was published in the Journal of Financial Economics in 2007, and has been cited 434 times. The authors are well known and cited over 1000 times, in particular Fritz Foley being cited over 5000 times.

1.2.3 The strategic use of corporate cash holdings in collective bargaining with labor unions

An article by Klasa, Maxwell and Ortiz-Molina published in the Journal of Finance in 2009 discusses the use of corporate cash holdings in collective bargaining with labor unions. The article provides evidence that firms in industries with strong labor unions tend to hold smaller amounts of cash to increase their bargaining power. The idea is to hold low reserves of cash to make a more credible case that a risk of low liquidity threatens the firm's competitiveness and hence it cannot meet the union's demands.

Prior work by Mikkelson and Partch (2003) shows that firms with high level of cash holdings enjoys the benefit of being able to fully invest in growth opportunities. Hence, a direct consequence of the cash holding vs. bargaining power trade-off strategy is that the firm has less cash available to fully invest in new projects with high growth opportunities. The article also shows a positive correlation between increased cash holdings and higher probability of strikes for unionized firms.

The paper was published in 2009 in the Journal of Financial Economics, and has been cited 133 times. The authors are affiliated with respected business schools in the US, but are not as well known as the authors of our previous papers.

1.3 Theory

When labor laws become strict (i.e. when firms cannot hire temporary workers or fire them easily), firms have to keep more cash to reduce the probability of bankruptcy in case of facing a downturn or a reduction in revenue. Therefore, we expect that more flexible labor laws (in favor of employees) should increase corporate cash holding. Bates, Kahle and Stulz (JF2009) lists up four main motives behind a firm's decision for cash holdings.

1.3.1 The transaction motive

In line with classical finance models an optimal amount of cash must be held as firms incur transaction costs and have to make payments. Economies of scale indicate that bigger firms need to hold less cash.

1.3.2 The precautionary motive

Quite obviously, reasonable firms hold cash as a precautionary measure to cope with recessions. Among others, a paper by Opler, Pinkowitz, Williamson and Stulz (1999) show that the amount of precautionary cash holdings increase with costlier access to capital markets and risky cash flows. This motive also indicates that firms with better investment opportunities tend to hold more cash as adverse shocks and financial distress is more costly for them. Riddick and Whited's (2009) research shows a positive relationship between a firm's exposure towards risk and its cash holdings.

1.3.3 The tax motive

Firms must hold an amount of cash to be able to pay any outstanding tax within the due dates. Foley, Hartzell, Titman and Twite (2007) shows that US firms repatriating foreign earnings holds higher levels of cash as it is taxable. Hence, multinational firms have higher level of cash holdings.

1.3.4 The agency motive

Jensen (1986) argues that entrenched managers would rather hold excess cash than to increase payouts to shareholder in case of poor investment opportunities. Dittmar, Mahrt-Smith and Servaes (2003) doing cross-country research found evidence of higher cash holdings in countries with higher agency problems. Hence, agency problems are positively correlated with corporate cash holdings. Research by Harford, Mansi and Maxwell (2008) suggest that entrenched managers tend to build up excess cash balances and also spend them relatively quick. Hence, the excess cash does not provide much security.

The interesting part valid for our research question is the precautionary motive, as we discuss the affect of an exogenous factor, labor laws, on corporate cash holdings. Reading up on relevant articles and using the acquired knowledge from being students at BI for half a decade, we are able to conclude that any reasonable entity (company) will try to manage it's exposure towards risk factors. Labor protection laws are not a risk factor in particular; on the contrary the strength of these laws will give employees a feeling of insurance and safety. However, in time of distress and financial crisis the strength of these contracts could potentially mean business going belly-up.

Based on equilibrium macro economic models, a company hires and fires staff according to productivity and demand. But when labor laws and contracts are involved in the process, a company cannot simply lay off employees at all or without a form for compensation. The strength of the labor laws determines the level of power between a firm and the staff. A reasonable owner/manager would take into account wage and fixed expenses that must be paid in all states of the economy. Hence, the firm must keep a certain level of liquid assets (cash or short term government bonds) to be able to meet the required payments in time of distress. Bearing these facts and theories in mind, we have arrived at the following hypotheses.

1.3.5 Hypothesis 1

When labor laws strengthen, the corporation will increase its cash holding.

This is to have a buffer in case of lower demand for firm's products or financial distress. The cash would be used to compensate laid off staff and pay wages to retained staff in the wait for the economy to recover.

1.3.6 Hypothesis 2

As the cash holdings increase due to labor laws, the firm's investments will decrease.

This is quite obvious as a part of the assets that was intended to use in production/investments now have to be converted to cash and held liquid. This hypothesis have been tested and confirmed in articles we have used in our research.

1.3.7 Modigliani-Miller theorem

The Modigliani-Miller theorem developed by Franco Modigliani and Merton Miller is a cornerstone for modern corporate finance. According to their theorem developed in a world without taxes, they state that conditions under a firm's financial decisions do not affect its value. Hence, in the modern thinking on capital structure the theorem states that under certain market price process of taxes, bankruptcy costs, agency costs, asymmetric information and efficient market is not affected by how the firm is financed.

1.3.8 Labor Law

The International Labor Organization (ILO) was created in 1919, and was developed to provide a system of international labor standards to protect a particular issue, for instance providing working women with maternity protection, or ensuring safe working conditions for agricultural workers. Aiming to give women and men opportunities to obtain decent and productive works, which are regulated according to freedom, equity, security and dignity. By creating international standard require representatives from several parties such as, governments, workers, and employers from around the world.

The International Labor Office is therefore responsible for preparing a report that analysis the laws and practices. In order to adapt a standard it needs to have two-

third majority of votes by conference participants. Furthermore, ILO member states are required to submit any convention adopted at the International Labor Conference their national competent for relevant legislation or other action. Since we are in a globalized economy, international labor standards has huge impact and are an essential component in the international framework for ensuring that the growth of the global economy provides benefits to all parts.

1.3.9 Labor Union Laws

Since 1935 the Congress have passed the National Labor Relations (NLRA), the intention was to encourage a more stable and healthy relationship between workers and their employers in the private-sector. Intuitively, employers were not obligated to recognize a union, but by establishing a union gives employees´ basic rights to join and opportunity to engage in collective bargaining. Furthermore, Congress also hoped that the union could help to reduce the work stoppages, strikes and other conflicts that may arise between labor and management that had often occurred in violence.

The National Labor Relations Board (NLRB) was also created by the act in order to enforce the NLRA. Most importantly, the NLRA allowed unions to represent employees according to the law. They were also enforcing to accomplished three significant tasks. First, allowing workers to vote and decide if they if they wanted to be represented. Second, establishing laws protecting employees from discrimination, which is based on union or group-related activities. Third, NLRB was created as an administration organization to enforce the law.

1.3.10 Bargaining power against labor unions

In studies by Klasa, Maxwell and Ortiz-Molina they used a firm´s industry unionization rate as a primary proxy to examine whether the firm is likely to bargain with a powerful union that represents a large number of the firm´s employees. They were aiming to examine how important for firms are likely to gain bargaining power advantage over unions, and also to test the negative relation between unionization and corporate cash holdings. In general, where firms that have labor costs that represent a significant percentage of the total costs,

and how important it is to gain a bargaining advantage against unions, in order to control and minimize labor costs for the firm.

1.4 Methodology

1.4.1 Panel data analysis

We aim to use panel data analysis for the thesis, as we are going to examine changes in firms' behavior regarding corporate cash holdings given the strength of labor protection laws. The method is used when researcher have access to observations of same individuals/firms over a given time period, and can than run a regression on two dimensions. This analysis seems to fit for our purpose as we have access to observations for firms between 1990s and 2013. We will mainly use Stata to run regressions and perform hypothesis test, but may also take advantage of other programs such as Excel, E-views or Matlab. Hausman's test will be used to determine whether we should run fixed-effect (FE) or random-effect regression, although the theory and past research suggests a fixed-effect regression for this type of problems.

$$Y_{i,t} = \alpha + \beta X_{i,t} + \varepsilon_{i,t}$$

Y is the endogenous variable and X is the exogenous (independent) variable. Beta measures the effect of X on the output Y, and alpha is a constant term. The subscripts define the given firm and time period. Since we are dealing with fixed effect regressions, the error term is assumed to vary non-stochastically over time or firms (implying a non-random walk). FE regression is used as we are only interested in analyzing the impact of predictor (labor laws) on outcome (variations in cash holdings) as they vary over time, within an entity (company).

The regression also allows for certain characteristics within the entity that could, in addition to the predictor, have an impact on the outcome. These characteristics are individual for entities such as which industry the firm belongs to, certain policies and type of management. This is the rationale behind the assumption of checking for the correlation between the firm's error term and the predicting

variable. The regression removes the effects of time-invariant factors on the outcome, and the researcher is able to analyze the net effect of predicting variable on the outcome. FE assumes non-correlation between the time-invariant characteristics of firms, and correlation suggests we should use another model (Hausman's test).

A possible model we can use to examine FE is the Least squares dummy variable model (LSDV). The model uses a dummy for each firm, and allows estimating the pure effect of predictor variable, controlling for the unobserved heterogeneity.

FE regression controls for all time-invariant differences, hence the estimated coefficients cannot be biased because of omitted (time-invariant) variables. FE cannot be used to investigate the time-invariant variables affect on the dependent variable, but this does not seem to be a problem for us at this stage. The FE models are designed to study the causes of changes within a firm, and that is our aim.

1.4.2 Tobin's q model

Another method that we may use in our study is Tobin's q model, which has become common practice in several finance literatures. The purpose is to calculate the ratio by comparing the market value of a firm equity and liabilities with its corresponding book values and to test how that are related to firms' cash holdings. We are also aiming to test the relation between risk, labor costs and cash holdings. By constructing a direct measure factor of volatility and cross-divisional correlation in labor cost and cash flow.

1.5 Data

We have access to several academic articles related to our thesis, which we have already used in the preliminary report. For the explicit data gathering, to be able to do an empirical study, we will access the databases given below.

We will be using the CCGR (Center for Corporate Governance Research) database, which holds the accounting data for the universe of firms in Norway from 1990s and up till date. The CCGR is quality controlled by BI's Department of Finance with devices such as a commitment to publish in reputable academic journals, close interaction with Norwegian businesses and regulators and a policy of publishing the findings to the general public through media. Hence, we can be confident that the available data is accurate and legitimate.

Data regarding labor protections laws will be obtained from the OECD database (Organization for Economic Co-operation and Development). The OECD is an organization for economically developed countries such as Norway, and promotes economic and social welfare. The database houses very thorough data on member countries regarding almost every economic aspect, and OECD is a frontrunner for transparency and integrity. Hence, it is a secure data mining source for our thesis.

There have been a lot of changes in labor protection laws from 1990s and onwards, and we are planning to exploit them to study changes in corporate cash holdings. We may therefore have to use databases regarding labor and corporate law to get a deeper insight into the topic.

The Norwegian Working Environment Act (Arbeidstilsynet) and the SSB (Central bureau of statistics) databases could also be of interest for the thesis. These are professionally governed departments and offer a deep insight into the Norwegian economy and labor market. We believe that exploring the above listed databases should offer us the data we need do our study to the full extent. We may also take use of certain books and articles published in reputable academic journals recommended by our supervisor.

1.6 Reference

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