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# The Motherhood Wage Penalty: A Varieties of Capitalism Approach

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This paper aims to relate the issue of the Motherhood Wage Penalty to the institutional framework "Varieties of Capitalism." Using data from the Luxembourg Income Study, we perform cross-national analyses on the discrepancy in wages between mothers with young children and females without children. The second step of the analysis entails four different measures with relevance to both the institutional framework and our applied gender focus. We find that when nations exhibit features in line with "coordinated market economies," characterized by relatively stubborn employment protection, smaller degree of general inequality, more concentrated wage bargaining, and higher rate of unionization, mothers are relatively more penalized in monetary terms compared to "liberal market economies." The results add valuable insight to the limited gender literature within the framework and propose follow-up questions for expanding the efforts of gendering the Varieties of Capitalism.

Keywords: Varieties of Capitalism, Motherhood Wage Penalty, Gender Economics, Institutional theory, Labor Economics

JEL: J16, J31, J50, D02, P10

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## Overview of abbreviations, figures, and tables

### Abbreviations

CLM: Classical Linear Model

CME: Coordinated Market Economy

LIS: Luxembourg Income Study

LME: Liberal Market Economy

MWP: Motherhood Wage Penalty

OECD: Organization for Economic Co-operation and Development

OJT: On-the-Job Training

OLS: Ordinary Least Squares

RWM: Relative Wages of Mothers (compared to non-mothers)

VoC: Varieties of Capitalism

Explanations for country codes can be found in table A11 in **10. Appendix**.

### Figures and tables

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## 1. Introduction

Despite numerous attempts from policy makers and regulators to promote policies such as paid parental leave and anti-discrimination laws, the motherhood wage penalty (MWP) is a persistent feature of both advanced and developing economies. The MWP is represented by the relatively lower wages of mothers compared to childless females (commonly referred to as non-mothers in the literature). Found by Crittenden (2001), is that for women younger than 35, the motherhood wage gap in the US is actually larger than the gender wage gap. As will become apparent from the background and literature review sections, the phenomenon of the MWP has been studied extensively with most countries exhibiting a significant discrepancy in the wages of females with and without children.

A less developed perspective, though, is one linking the MWP to the Varieties of Capitalism (VoC) framework (Hall, Soskice 2001). It is used to characterize economies as liberal market economies (LMEs) or coordinated market economies (CMEs) based on how firms in a given nation coordinate their relationship to other actors within the economy. Based on the VoC framework, a set of different aspects of market economies regarding areas such as the unionization rate (trade union density) and the income dispersion in a country and how they relate to coordinated and liberal market economies, respectively, can be put forward.

In this thesis we investigate the MWP in relation to the VoC framework through a cross-country comparison. We want to increase our understanding of wage inequality and its connection to institutional settings as described by the VoC framework. This is believed to be of use as this can add insight to if, and in which direction, institutions affect the relative wages of mothers, and in turn what measures could be taken in correcting the wage penalty. However, prescribing policy adjustments is outside the scope of our thesis as that would require extensive knowledge of state policies and their implications. Currently, the gendering of the VoC framework has had occupational sex segregation as a main focal point rather than actual wage inequality. Our goal is to expand the currently limited gender section of VoC with working mothers being the center of the analysis. The results will give an indication of how the variation in the MWP fit with the characteristics underlying the VoC, and the framework itself. The purpose of our thesis can be condensed into two research questions with regards to what we have set out to examine:

(i) *Does the presence and extent of the MWP within each country relate to the VoC framework's dichotomy?*

*(ii) Does the presence and extent of the MWP within each country relate to the characteristics inherent to the two types of capitalism in the framework?*

The thesis is structured in the following way: first, we account for the common theories used to explain the basis for the MWP and what has been found in previous research, in order to shed light on some of the prescribed reasons as to why it is a persistent feature on the labor market. Then we present the VoC framework and review the current state of the art on the connection between VoC and gender economics. We then put forth our hypothesis, based on the information covered in the background sections. In the following section, our dataset and the variables in our regressions are introduced. Data from the Luxembourg Income Study is used to find the MWP in a set of different countries for a number of years that are classified as liberal or coordinated market economies. In a second step, the MWP for a larger set of countries is estimated as well, treading outside the VoC framework. The calculated MWP for the different countries are then used to see whether a relationship can be found between the CME/LME dichotomy and the MWP, as well as between certain characteristics of the market economies and the MWP. In the succeeding section, we discuss our results, the implications they may pose, and propose questions for further research. Lastly, we review the limitations of our research and offer some concluding remarks.

## 2. Background and literature review

The following section lays out previous findings relating to the MWP as well as an extensive overview of the VoC framework. The literature examined makes up the basis for the hypothesis and the manner in which the analyses are carried out.

### 2.1. The Motherhood Wage Penalty

To explain the wage penalty for motherhood, both economic and sociological theories have been put forth. They will be reviewed below together with previous research.

#### 2.1.1. Economic theories

*The human capital theory*

One theory commonly used to explain the wage penalty for motherhood is the human capital theory. Becker proposes that by labor division and human capital investment specialization into

either the market or the household sector, parties in a household can achieve maximal efficiency and utility. Normally, there is sexual division of labor in all societies between the household and the market sector. The division of labor is partly based on comparative advantage, that it is optimal to invest in one kind of human capital only, and partly based on biological differences as women carry the heavy load in reproduction. Becker claims that women are prone to put a lot of effort into the rearing and caring for children as they want to make sure their biological investment pays off. He points out a complementarity between bearing and rearing children; mothers are able to bear additional children while taking care of the household and the ones she already has. The wage difference between women and men, as well as women with children and women without children is then partially because of women's (mothers') lesser investments in market capital and higher investments in household capital in this stylized setting. The more a woman has invested in household human capital, the more efficient it becomes for her to keep investing. The same is applied for men's (non-mothers) investments in market human capital (Becker 1991, Chapter 2).

*The allocation of work-effort theory*

Another theory put forth is the work-effort theory which slightly overlaps the human capital theory but focuses on the effort exerted by employees when at work.

The later part of the 20$^{th}$ century saw a remarkable increase in labor force participation of married women and mothers which according to the human capital theory should have led to women making bigger investments in the market sector and thus, increased their salaries. However, labor force participation and the same number of hours worked in itself does not entail salaries for women and men being on the same levels. Due to gender roles, women tend to take bigger responsibility for household work and child caring than men. These time- and energy-consuming activities have mainly two consequences: women have less energy to exert when working as well as less access to jobs demanding travel or long/odd work hours. The lower salary of mothers relative to childless females and men is because of a lower amount of energy spent at work and lower investments in human capital, which dampen the labor force participation of mothers. The lesser participation rate, in a negative spiral, discourages the investment into market capital even further. Becker argues that in the US, full-time employed married women do more household work than unemployed or part-time employed married men as well as full-time employed married men. The amount of hours worked is also less for married women than married men, despite both working full-time. Furthermore, women with children

tend to seek occupations that are less energy-consuming and have more flexibility. These jobs, often in female-dominated sectors, are generally connected to lower average salaries (Becker 1991, Supplement to chapter 2).

### 2.1.2. Sociological theories

In addition to the (micro-) economic theories, there are also a number of sociological theories explaining the MWP.

*The status characteristic theory*

The status characteristic theory is based on the conception of mothers being less committed to their employment and less competent than females without children. The theory is somewhat self-fulfilling as workers perceived more competent and committed are given access to higher-status occupations which reinforces the notion of mothers not being suited for such employment simply because there are not many mothers that can pose as examples. The cultural interpretation of an ideal worker (a person that is committed to his or her job and is able to put in all effort required) does to some extent stand at odds with the expectations of motherhood where a woman is supposed to put the care for her children first, and employment second. Employers will therefore, consciously or unconsciously, discriminate against mothers and choose to employ childless females or men rather than mothers (Correll, Benard & Paik 2007).

*The normative discrimination theory*

Somewhat connected to the status characteristic theory, is the theory based on normative discrimination where the traits of caring and thoughtfulness are normatively stereotyped to describe women whereas men are stereotypically perceived as more determined and intelligent. This results in men getting access to leadership roles and higher positions whilst women are considered unfit for such occupations. Descriptive stereotypes (what individuals *are*) can be posed against prescriptive stereotypes (how individuals *should act*). If only descriptive stereotypes were at play, women (cf. mothers) should "simply" imitate the traits of men (cf. non-mothers) to lessen the discrimination against them. Because of prescriptive stereotypes, however, when women (mothers) act as men (non-mothers), they go against how societal norms prescribe they ought to act and are therefore discriminated against due to this. The

normative discrimination theory presents a catch 22 for working mothers on the basis that they *should* act as non-mothers (focus on their career and aspire to reach high-level positions), but when they in fact do, they are considered to be "bad" mothers and penalized and discriminated against. A "good" mother, in the eyes of society, is one who sets the care of her children first and therefore is less inclined to prioritize their employment (Correll, Benard & Paik 2007; Kricheli-Katz 2012; Rudman, Glick 2001).

There is one additional sociological theory of the MWP, *the motherhood as a status of choice theory* (see e.g. Kricheli-Katz 2012). However, we make no use of this in our thesis and have hence chosen not to delve further into it.

### 2.1.3. Previous research

Although much previous research has been US-centered, the MWP has been found to exist in a large number of countries. Lundberg (2012) uses data from the Luxembourg Income Study to study the cross-national variation of the MWP in eight industrialized countries and finds that mothers are paid less in all countries studied (Belgium, France, Luxembourg, Germany, the Netherlands, the UK, Canada and the US), apart from the Netherlands. Livermore, Rodgers & Siminski (2011) use panel data to study the MWP in Australia. They find a wage gap of circa five percent for the first child, which grows to nine percent for a mother with two or more children. In addition, results from the study indicate that wages are affected mainly through lower growth rather than as a direct wage drop after bearing a child. Gupta & Smith (2002) analyze the effect of children on mothers' wages in Denmark. They demonstrate that holding job experience fixed, there seems to be no persistent effect of becoming a mother on the wage. Rather, the predominant consequence of bearing children appears to be the lessened investment in human capital. In Germany, Buligescu et al. (2009) find a maternal leave wage penalty ranging between ten to fourteen percent. However, their results point to the wages of mothers being back on comparable levels with non-mothers five years after the end of the maternal leave.

Due to lack of more recent data, many papers use data from the 1980's up to the early 2000's. One factor that justifies the use of less up-to-date data is presented in Avellar & Smock (2003) whose findings propose that the MWP in the US has not decreased over time in a comparison between samples from 1975–1985 and 1986–1998. Somewhat contradictory to their discoveries, Petersen, Penner & Høgnes (2010) examine the within-job MWP in Norway

between the years 1979 and 1996 and discover that the wage gap for mothers declined during the period studied. The disaffirming results can be an effect of national policies attempting to correct the negative wage bias for mothers in Norway.

The human capital theory is explored by Meurs, Pailhé & Ponthieux (2010) who look at the MWP in France. Using longitudinal data, they compare the wages of women who have child-related career interruptions to the wages of women who have not. Their results indicate that a large part of the wage difference (about two thirds) arises due to the lesser actual work experience of women with career-interruptions as well as the negative return of taking time away from work for child-caring. Budig & England (2001) identify the disruption in full-time job experience and tenure due to child-bearing as being one clear cause of the MWP in the US. In a study of British wages of women in their thirties, Joshi, Paci & Waldfogel (1999) on the other hand discern that lower investment in human capital became less important in explaining the MWP than low wages in part-time employment in a comparison between 1978 and 1991.

Also explored by Budig & England (2001) is the work-effort theory, whether mothers accept lower wages in exchange for occupations that are more "mother-friendly," for which they do not find any significant evidence. Somewhat at odds with Budig & England, Anderson, Binder & Krause present evidence for the work effort theory based on the conclusion that the MWP should decrease when the children grow older as less energy will be exerted on child care and can be redirected into work effort instead. A wage penalty of 2.7 percent is found when the children are between 0–2 years old, which diminishes to 1.1–1.7 percent for mothers with older children. The MWP does, however, endure even as the children grow older. Anderson et al. note that the work effort theory is not likely to explain the entire wage gap, based on their results on the wage penalty difference within education groups. For example, no wage penalty is found amongst college-educated mothers despite their jobs being prone to require much effort. The largest wage gap is found for high-school educated mothers for which the proposed explanation is that high-school graduates are likely to be constrained to take employment during office hours, rather than them exerting less effort when working (Anderson, Binder & Krause 2003).

Correll, Benard & Paik (2007) study the validity of the status characteristic theory through a laboratory experiment in a US setting. Their hypothesis is that mothers will be seen by employers as less promotable and proposed lower starting salaries than childless females, despite having the same qualifications. The hypothesis is tested through fabricated job

applications in one laboratory and one audit study, respectively. They find that childless women are considerably higher-rated in terms of competence and commitment than mothers. Mothers were also deemed to be less hirable and deserve a starting salary of approximately seven percent less in comparison to non-mothers. The results of the audit study show a lower call-back rate of mothers relative to the call-back rate of non-mothers. Noteworthy, although beyond the scope of this thesis, is that the authors find no similar wage penalty for fathers.

Explored by Buchmann & McDaniel (2016) is the effect of sex segregated professions on the MWP. In male-dominated professions, such as law, STEM (science, technology, engineering and mathematics), business and medical professions, compared to female-dominated professions (e.g. librarians and social workers), mothers face a lower wage penalty. Within STEM and medical professions, mothers actually experience a wage premium compared to non-mothers.

## 2.2. Varieties of Capitalism

### 2.2.1 An overview of the framework

The Varieties of Capitalism-approach to the political economy was first posed by Hall & Soskice (2001). The idea behind VoC is that developed economies can be divided into either Coordinated Market Economies (CME) or Liberal Market Economies (LME). The dichotomous division is primarily based on five spheres, each representing and explaining the different relationships firms must form to solve coordination problems relating to their core competencies.

The first sphere relates to industrial relations, i.e. how bargaining processes are coordinated. The measure of interest here is the degree of centralization in wage bargaining. The wage bargaining tends to be more fragmented in LMEs and more centralized in CMEs. The second sphere relates to how skills are formed, either specific to an industry/company or more portable and general. Corporate governance is the third sphere, where companies' access to finance is dependent upon either short-term or long-term returns on investments. Inter-firm relations is the fourth sphere where countries differ in how firms cooperate with each other, either through mostly formal contracting in a highly competitive environment or through more informal connections characterized by contracts that take on a more incomplete or relational form. Finally, the fifth sphere encompasses the relations between management and employees. The issue emphasized here is how much influence employees have in decision-making.

LMEs, generally speaking, coordinate employee-related activities based on a hierarchical system with formalized contacts with other firms where mechanisms of the market is the main coordinator based on supply and demand conditions for workers and firms.

In CMEs, on the other hand, firms rely more on non-market modes of coordination. This means that companies are more prone to develop inter-firm relationships within networks, where otherwise proprietary information is shared between companies. This means that CMEs are generally characterized by a "reliance on collaborative, as opposed to competitive, relationships to build the competencies of the firm." (Hall, Soskice 2001, pp. 8) According to Hall and Soskice, this means that in comparison to LMEs, where the competitive forces of supply and demand determine firm behavior and market equilibrium outcomes, companies in CMEs have a tendency to coordinate through strategic interaction between the economy's firms and other key players.

One obvious caveat is that firms in LMEs do not necessarily depend completely on market coordination in all cases. However, the dichotomous division is made on the basis of systematic variation in these measures regarding primary coordination. Furthermore, it is claimed that firms within different countries will shift their ways of coordination depending on the institutional support present in each country. For instance, it is mentioned that for firms to coordinate efforts differently from LMEs it is important that institutions support such behavior. One main issue exemplifies this, namely the one of "collaborative vocational training schemes" (Hall, Soskice 2001, pp. 10), related to on-the-job training (OJT). Here it is said that firms need assurance that the time and money invested in employees will bring companies benefits through long-term employments. This issue in particular has been subject to previous gender research within the VoC framework (Estévez-Abe 2006).

Below in Table 1, 17 OECD countries that are classified as either LMEs or CMEs are presented. Most of these countries, subject to data availability, serve as our main sample in this thesis. A larger sample containing country-year observations from the OECD will also be used for further analysis.

Table 1. Countries classified in the Varieties of Capitalism framework. Adapted from Hall and Soskice (2001)

| **LMEs** | **CMEs** |
|---|---|
| *Australia* | *Austria* |
| *Canada* | *Belgium* |
| *Ireland* | *Denmark* |
| *New Zealand* | *Finland* |
| *United Kingdom* | *Iceland* |
| *United States* | *Germany* |
| | *Japan* |
| | *The Netherlands* |
| | *Norway* |
| | *Sweden* |
| | *Switzerland* |

There are four main factors behind the division in VoC that are of interest to our analysis: the trade union density, the process of wage bargaining and the level of income inequality. These measures, we believe, are the ones most important to analyze as union density, wage bargaining and employment protection are closely connected to firms' employee-related endeavors. The Gini coefficient is included as it is of interest to examine the possible connection between the MWP and overall levels of inequality. The measures are summarized in Table 2 below, indicating differences between the two types of capitalism. Other measures, we believe, are less important to wage inequality as seen through the VoC-lens as they mostly deal with issues of comparative advantage, a feature of the VoC that is outside the scope of our chosen topic.

Table 2. Factors for CMEs and LMEs as determined by the VoC-theory. Adapted from Hall and Soskice (2001)

| **Measures of interest** | **LME** | **CME** |
|---|---|---|
| Trade union density | *Low* | *High* |
| Wage bargaining | *More fragmented* | *Centralized* |
| Income distribution | *Less equal (High Gini)* | *More equal (Low Gini)* |
| Employment protection | *Weak* | *Strong* |

In Table 3 under **5.2. Relationship between the explanatory variables and the Varieties of Capitalism framework**, we show that a significant relationship can be found between the VoC-classification (LME/CME) and the measures listed in Table 2.

### 2.2.2 Criticism

The dichotomous layout of the VoC has received criticism, and the assumption of stability in the classification over time has been questioned by many. Schneider & Paunescu (2012) have developed a more encompassing model where market economies are classified into five

different groups, taking into account re-classifications over time. Further criticism relates, for example, to the framework being too focused on institutional coherence as a necessity for comparative advantage (see e.g Schröder, Voelzkow 2016; Witt, Jackson 2016; Streeck 2012; Deeg, Jackson 2007).

Deeg & Jackson (2007) mention that the way VoC is presented is problematic, given that the theory emphasizes institutional stability and neglects change over time. The criticism mainly stems from issues pertaining to increased internationalization. The implication is that the usefulness of the national boundaries viewpoint is questioned.

Given the criticism of the framework, one could ask whether carrying out cross-national analyses with the framework in mind is a worthwhile exercise. We believe that in spite of the resounding critique, the VoC is an important starting point for any discussion of institutional settings and their effects on people and organizations. As previously mentioned, the gender section of VoC is rather limited, and our findings will provide important implications for the framework's viability from such a perspective. However, to expand the scope of analysis, we have made the choice to further examine measures pertaining to the framework itself. By carrying out the regressions in these two steps, we mitigate possible problems with the manner in which the framework was originally developed while still maintaining an institutional focus.

### 2.2.3. Gender aspects of the Varieties of Capitalism framework

One author, Estévez-Abe, has made a particular contribution to the literature in her efforts of gendering the Varieties of Capitalism. The heart of the analysis is the presence of occupational sex segregation (vertical and horizontal) in advanced industrial countries. Vertical segregation applies to the phenomenon of female underrepresentation in prestigious occupations in the top layers of the organization and female overrepresentation in low-status occupations. Patterns with under- and overrepresentation across sectors of the economy, i.e. horizontal segregation, can also be distinguished (Estévez-Abe 2006).

Estévez-Abe develops a model that seeks explanations for cross-country differences in occupational sex segregation, focused mainly on microeconomic rational thinking. Agents behave in ways that minimize risks pertaining to future employment as seen through the security of skill investments. Risk assessment of investments are believed to be affected by institutions (e.g. through employment protection). Men and women hold different risk profiles

of investments parallel to how employers perceive riskiness in employee investments, where the gender of the potential employee reveals the level of risk the employers expose themselves to.

Furthermore, a division in types of work-related skills is made where the portability of said skills matter greatly for the riskiness in their investments. Three types of skills are identified; firm-specific, industry-specific and general, where portability is the lowest for firm-specific skills and highest for general skills (especially when certified through e.g. a diploma). In economic downturns, general skills are believed to be the only "safe" ones to invest in.

As the model proposes that institutions can alter risks associated with skill specificity, strong employment protection will change risk assessments among actors and thus make them more prone to invest in specific rather than general skills. The implication from this is that when there is no or little institutional protection for employees, a risk-averse worker should invest in general skills enabling portability to the largest extent possible. Portability, seen as more safe from the employee's perspective, is associated with a larger risk for employers, as they run the risk of losing the investments they have made in the employees' human capital if the employees were to leave the firm.

The gender perspective enters the model through the premise of women-specific risks arising as a result of the biological differences between the sexes, as well as the traditional gender division of labor at home. These risks include issues of not obtaining jobs due to employers' risk assessment of parental leave, the risk of losing monetary compensation for retained skills due to parental obligations, and risks associated with interrupted skill formation resulting from said leave. *Ceteris paribus,* this means that women are less likely than men to invest in skills with low portability. Another implication here is that policies strengthening employment protection will benefit male skill investments relative to female skill investments. Thus, Estévez-Abe hypothesizes that strong employment protection institutions will aggravate the occupational sex segregation. Skill formation is also believed to affect segregation, as when employers are involved in skill formation through e.g. OJT, women will be discriminated against as risk-averse employers would prefer to make such investments in males.

Furthermore, Estévez-Abe proposes that policies such as paid maternal leave can lead to even larger problems with sex segregation, as employers have to bear indirect costs associated with long leaves (such as hiring and, in the case firm-specific skills are paramount, educating

replacement workers as well as arranging a frictionless reintegration of returning workers). It should be mentioned that the empirical findings do not support this view.

One of her conclusions is that CMEs tend to exhibit a larger sex segregation than LMEs, and Scandinavian countries with institutional support for working mothers do not exhibit a lower level of gender segregation compared to other CMEs.

## 3. Hypothesis

Given our research question, the basis for the hypothesis is rather limited due to the current state of the art for gender research within the VoC. We can however make predictions of the outcome based on implications from previous findings on occupational sex segregation (Estévez-Abe 2006) and results found in previous MWP research.

Given the different characteristics of CMEs and LMEs mentioned earlier, one would be tempted to quickly jump to the conclusion that mothers ought to be paid relatively less than women without children in LMEs. This intuitive line of reasoning is based on the aforementioned status characteristic theory (Correll, Benard & Paik 2007) and the normative discrimination theory (Correll, Benard & Paik 2007; Kricheli-Katz 2012; Rudman, Glick 2001). Both theories are similar in explaining why the MWP occurs, with the basis being societal norms of characteristics mothers exhibit and should exhibit. The relatively unprotected labor market, high degree of general inequality and low level of unionization present in the LMEs would therefore seemingly put working mothers at a larger disadvantage compared to childless women. Predatory employers seeking to maximize the output of their workers would make choices to not employ mothers when they have the choice whether or not to do so. Furthermore, the level at which wage bargaining occurs could be even more detrimental for mothers as employers could exert downward pressure on the wages of working mothers more easily than in CMEs, exacerbating the MWP. One would thus at first glance assume that the MWP is greater in LMEs.

Nevertheless, postulating a hypothesis purely on the basis of these characteristics would mean neglecting the results found by Estévez-Abe (2006), which are to some extent at odds with the reasoning put forth above. Even though her work effort pertains to an arguably different gender aspect of the VoC, her results regarding occupational sex segregation have important implications for wage inequality for women in general. If it is true that CMEs exhibit a higher degree of occupational sex segregation, with women being expatriated to traditionally female

fields of work (which disputes the expectations outlined previously), this would imply that women are at a disadvantage on the labor market to a greater extent in CMEs than in LMEs. So, if women in general are relatively disadvantaged in CMEs, do we expect women with young children to be punished to a greater extent here as well, relative to childless women? *Ex ante*, this is difficult to predict. Women who are already punished monetarily based on risk-minimizing behavior from employers and employees, partly in line with the sociological theories of the MWP, might not be exposed to the same type of punishment for having children, given that the risk that female employees will leave the workplace for an extended period of time should already be accounted for in wages of women in general. Thus, Estévez-Abe's research on the gender aspect of the VoC does not necessarily imply that the segregation levels in CMEs are directly related to the extent to which mothers are punished for having young children.

However, findings on occupational sex segregation and the connection to the MWP (Buchmann, McDaniel 2016) do hint toward what one can be expected to find regarding its connection to the VoC framework. Given that women with children seem to be punished to a lesser extent in male-dominated professions, we would expect the MWP to be relatively smaller in economies exhibiting a smaller degree of occupational sex segregation, i.e. LMEs. This expectation is derived from the argument that a larger amount of women in historically male professions should compensate for the persistent MWP found in historically female occupations. It should be noted that the phenomenon found is not explained by the authors, more than in speculative terms. Follow-up research has focused on the effects of long work hours in explaining MWP differences (Weeden, Cha & Bucca 2016), but this explanation lacks relevance as we control for hours worked.

It is not crystal clear whether women with children will be at a greater disadvantage in either CMEs or LMEs based on the information we have, as different articles imply different expectations. This makes the task of postulating a hypothesis quite cumbersome. However, the fact that previous research has found a link between the MWP and occupational sex segregation coupled with findings of larger segregation in CMEs leads us to believe that the MWP is larger in these coordinated economies relative to the liberal ones. But this hypothesis does not exhibit perfect coherence with what one can expect to find regarding the highlighted differences in the analyzed characteristics.

Based on the hypothesis, the entire set of independent variables *should* be negatively correlated with the MWP, with the exception of the Gini coefficient as this measure increases with increased inequality. These implications are derived from the fact that CMEs are characterized by relatively more centralized wage bargaining, stronger employment protection, and a higher unionization rate, while the Gini coefficient is generally smaller. It could of course be the case that some of these measures lack explanatory value regarding the extent of the MWP or that some measures exhibit correlations in the opposite direction. We believe this is possible, as the implications from the hypothesis seem strange at first glance. For instance, there is ambiguity regarding the Gini coefficient's connection to the MWP (Lundberg 2012). However, it would be very difficult to argue that higher levels of general inequality would mitigate the MWP. Additionally, it is plausible that the coordination of wage bargaining is positively correlated with the MWP, i.e. that when wage bargaining is more centralized (the coordination of wage bargaining index taking on higher values), the income dispersion shrinks. This relates to the earlier argument, namely that when individual employers are given more freedom in their wage setting, they are able to discriminate the wages of mothers more abundantly than when wages are set in a centralized fashion. It is, however, hard to say *ex ante* if this will be evident in the data.

To conclude, our first hypothesis is that countries within the CME category will exhibit a larger wage penalization for mothers compared to their liberal counterpart. Our second hypothesis states that the independent variables, or characteristics of the framework, are associated with worse outcomes for mothers when taking on values more aligned with the CME type.

## 4. Empirical method

### 4.1. Data and method

To calculate the extent of the MWP and make cross-country comparisons, we use data from the Luxembourg Income Study Database (LIS) that compiles data from several upper- and middle-income countries. The database is the largest harmonized income micro-database and each dataset contains household- and individual-level data for a country in a given year on, for example, labor income, demography and employment. The LIS data is collected in several waves and is appropriate for cross-sectional analysis only as there are no links between individuals or households across data waves. Individual-level data is used in calculating the MWP for each respective country studied. Of the 17 OECD countries classified as CMEs or

LMEs by the VoC framework, LIS provides data on 15 of them. The countries without available LIS data (New Zealand and Japan) are therefore excluded from our study. The datasets for Sweden and Norway do not contain information on necessary variables such as "Weekly hours worked" or variables that could be used as a proxy for the amount of hours worked, and are thus excluded as well.

Data on the Gini coefficient for a country in a given year is also provided by LIS.

Information on cross-country trade union density is collected from the OECD Labour Force Statistics database in which data for nearly all countries of interest is provided.

Furthermore, data on the employment protection index is provided by the OECD Employment Protection Database and is available for all countries studied. It should be noted that for some nations, no values are given for certain years. Given the relatively stable nature of the index over the years within the nations, we have chosen to assign index values for these years by using the ones available for adjacent country-year observations.

Lastly, the coordination of wage bargaining index is constructed by the Amsterdam Institute for Advanced Labour Studies (AIAS).

Our first step is to calculate the MWP for the VoC-classified countries. To increase the number of observations for economies classified in the VoC framework, which ultimately consists of only 13 countries, we have used several years of data for each country. This leaves us with a sample of 47 observations. For further discussion regarding the possible implications of this on our result, see **7.4. Small sample.**

As a second step, the MWP for a number of years for a larger set of countries outside the framework is calculated.

After calculating the MWP, we construct two separate datasets. One dataset includes only the observations for the VoC-classified countries and the other includes the observations for the full set of countries, i.e. both within and outside the framework.

To simplify the interpretation of the regressions, we will henceforth use the expression Relative Wages of Mothers (compared to non-mothers) (RWM) instead of MWP. However, the terms will be used interchangeably.

The calculated RWM is coupled with data on the Gini coefficient, the trade union density, and the employment protection index for a country in a given year in both datasets. For the dataset only including the VoC-countries, a dummy variable (LME) that takes on the value 1 if a country is an LME and 0 otherwise (i.e. representing CMEs) is added.

See Table A1 in **10. Appendix** for detailed country-year information on the Gini coefficient, the union density, the employment protection index, the coordination of wage bargaining index, and the RWM.

The constructed datasets are then used for regressions where the relationships between the RWM and the different measures, as well as the LME/CME-classification and the measures, are studied.

### 4.2. Variables

The RWM is calculated using multiple variable Ordinary Least Squares regressions (OLS-regressions) on a set of explanatory variables. To the largest extent possible, the same variables are used for all countries to improve the cross-country comparisons.

To only compare the wages of mothers to the wages of non-mothers, all men are excluded from the sample. To include only the working population, the age has been limited to range between 18 and 64, and only employed individuals are included. Furthermore, individuals with a recorded annual wage of $\leq 0$ are dropped, as these observations with negative incomes are likely to be data errors.

As previous research has pointed out that the RWM is likely to be the largest for mothers with young children (Anderson, Binder & Krause 2003; Gornick, Meyers 2003; Glass 2004), we have excluded mothers with children older than six years. This means that we compare the wages of mothers with children in the ages of 0 to 6 to the wages of females without children. The basis for the specific age division is based on the structure of the data provided by LIS.

In the calculation of the RWM, the log of annual income is used as the dependent variable. The annual income is measured as the monetary payments and value of non-monetary goods and services received from the dependent employment as well as the profits/losses and value of goods for own consumption from self-employment. We use the log of the annual income as wages generally are skewed in the direction of higher values.

For the mother/non-mother "status," we use a dummy (Parent) which takes on the value 1 if an individual has at least one child in the age of 0–6 years and 0 if an individual has no children. It could be argued that the number of children in the ages 0–6 should be accounted for under the assumption that a woman with more than one child in the age range studied would be more severely punished wage-wise. The rationale for not doing so is discussed in part **7.6. Choice of variables**.

Furthermore, as continuous variables, we use age, age squared, weekly hours worked, and the square of weekly hours worked. The square of age and weekly hours worked are included as we believe that the measures are subject to diminishing marginal utility. For Denmark, the measure of weekly hours worked is not available and thus, a dummy variable taking on the value 1 if a person is employed "full year, full time" (FYFT) is used instead. Furthermore, we code dummy variables for a person's highest completed education. We code one variable (Secondary education) that takes on the value 1 if an individual has completed secondary education and 0 otherwise, and one variable (Tertiary education) that takes on the value 1 if an individual has completed tertiary education (college or university). Individuals who have completed primary education are thus the reference category.

To capture the occupational status, we code two dummy variables based on a 3-category occupational classification. We have one dummy (Manager/professional) that takes on the value 1 if a person is a manager or professional (ISCO 1 and 2) and 0 otherwise. Another dummy (Skilled labor) is coded to take on the value 1 for persons in the category "other skilled workers" (ISCO 3–8), and 0 otherwise. The reference category is people in the category laborers/elementary professions (ISCO 9). Further information on what occupations each ISCO code represents is presented in Tables A2 and A3 in **10. Appendix**.

Additionally, a dummy variable (Single) that takes on the value 1 if a person is not single (lives with a partner) and 0 otherwise (does not live with, or does not have, a partner) is used as it is possible that single mothers might on average have incomes different from mothers with partners, for example because they may be unable to take on work requiring much travel or odd work hours.

The Gini coefficient is used as a proxy for income equality which is a measurement of the income dispersion within a country and a common inequality measure for cross-country comparisons. A Gini coefficient of 0 represents perfect equality whilst a Gini coefficient of 1 signifies maximal inequality. The Gini coefficient shows how the incomes vary relative to the

other residents of a nation. Income is measured as the residents' net income, i.e. income after taxes and transfers. The Gini coefficient does not capture whether a country is rich or poor, only the distribution of income among its population (Investopedia).

The trade union density is measured as the ratio of wage and salary earners within a given country that are members of trade unions to the total number of wage and salary earners.

The employment protection index is a weighted measure based on a number of different variables which "measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts." The index ranges from 0 to 6, where the strength of the employment protection increases continuously. For a full documentation of the measures included in the index, see Table A4 in **10. Appendix**.

The measure of coordination of wage bargaining is represented by an index taking on values between 1 and 5. A higher index value represents a more centralized bargaining structure, whereas a low number indicates a more fragmented wage setting structure where bargaining takes place largely in individual firms or at individual plants. As an example, both the US and the UK (LMEs) have an index value of 1, and Germany (CME) has an index value ranging between 3 and 4 depending on the year studied. However, there are no index data for Iceland which is thus excluded from the regressions in which the relationship between the VoC framework, the RWM, and the coordination index is studied.

### 4.3. OLS: Classical Linear Model Assumptions

To get valid results using the OLS-method, the Classical Linear Model (CLM) assumptions have to be fulfilled (Wooldridge 2016). MLR.1-4 need to be fulfilled in order to get unbiased estimators, i.e. $E(\widehat{\beta_j}) = \beta_j, j = 1, \dots, k$ for any values of the population parameters $\beta_j$. MLR.5-6 are needed in order to perform hypothesis testing using t- and F-tests.

*MLR.1: Linear parameters*

The model has to be linear in parameters, i.e.

$$y = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \cdots + \beta_k * x_k + u \qquad \textbf{(i)}$$

As presented below in part **4.4. Regressions**, all the tested models are linear in parameters which means MLR.1 is fulfilled.

*MLR.2: Random sampling*

A random sample of size n, $\left[\left(x_{i1}, x_{i2}, \ldots, x_{jk}\right); i = 1, 2, \ldots n\right]$ should be drawn from the population that satisfies equation **(i)** above.

LIS is a database building on harmonized micro-data from national governmental surveys, which ensures that sampling should have been made with respect to satisfying the randomness of samples.

*MLR.3: No perfect collinearity*

None of the independent variables should be constant. There should be no perfect collinearity between the independent variables.

In the regressions for RWM for each given country and year, we have controlled for multicollinearity, hence ensuring the fulfillment of MLR.3.

In Tables A5 and A6 in **10. Appendix**, the correlation between the independent variables for both the smaller set of countries (VoC-classified market economies) and the larger set can be seen. The correlation is less than perfect for all variables in both sets. Note that the collinearity is near perfect for some of the interaction variables. However, this is not uncommon and is usually not regarded as an issue. MLR.3. is thus fulfilled.

*MLR.4: Zero conditional mean*

Given any value of the independent variables, the error term, u, has an expected value of zero, that is, $E(u|x_1, x_2, \ldots, x_k) = 0$ which in turn implies $E(u) = 0$.

This assumption is generally accepted to hold, and will not be prone to further scrutiny.

*MLR.5: Homoscedasticity of standard errors*

The variance of the standard errors should be constant, i.e. $E(u^2|x_1, x_2) = E(u^2) = \sigma^2$.

With respect to the problem of possible heteroscedasticity of standard errors, the regressions have been performed with robust standard errors throughout. This corrects the standard errors for eventual heteroscedasticity of standard errors present in the data.

*MLR.6: Normally distributed standard errors*

The population error is independent of the explanatory variables $x_1, \dots, x_k$ and is normally distributed with mean zero and variance $\sigma^2$. Conversely, $u \sim N(0; \sigma^2)$.

When the sample size is "large," generally N > 100 observations, this assumption is considered to be fulfilled. Thus, the regressions for the country-year RWM are in no need of further examination as the smallest sample consists of 231 observations. In Figure 1 and 2, respectively, histograms on the residuals from the full-size regressions of RWM on the set of explanatory variables are presented. The distribution of the residuals, although not perfectly, approximate normal distributions (represented by the red line in the figures). Furthermore, Jarque-Bera tests has been performed for the distribution of the standard errors from the regressions in each respective dataset in which we are unable to reject the null hypotheses of normally distributed standard errors.

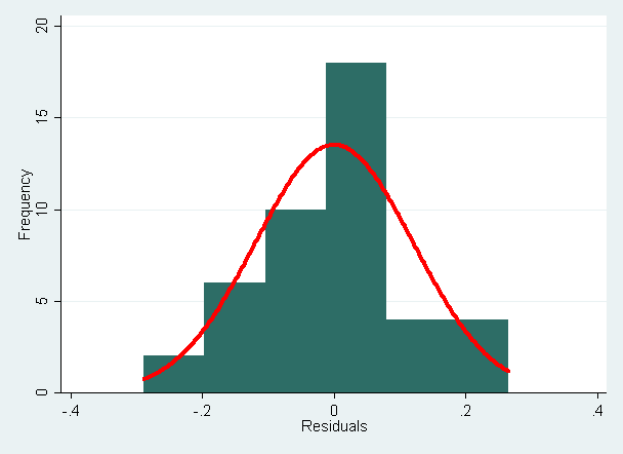


Figure 1. Histogram of the residuals for the regression of RWM on the explanatory variables for the VoC-countries

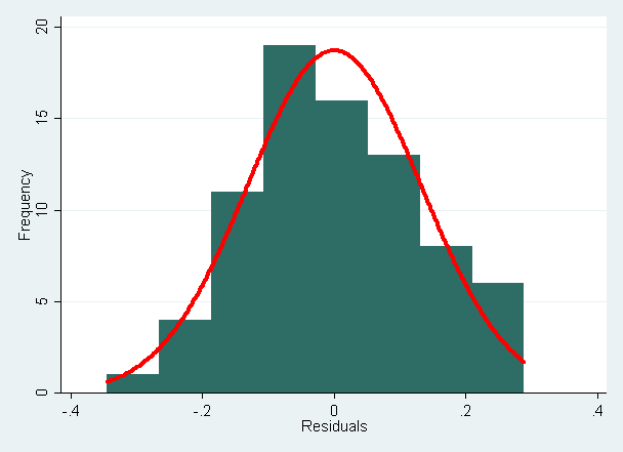


Figure 2. Histogram of the residuals for the regression of RWM on the explanatory variables for the full set of countries

### 4.4. Regressions

*"lwage_tot"* represents the logarithmic wages based on the set of independent variables, where the coefficient for *parent* will capture the RWM.

The RWM for each respective country in a given year, apart from Denmark, is estimated using regression (ii) below.

$$lwage_{tot} = \beta_0 + \beta_1 * parent + \beta_2 * age + \beta_3 * age_{sq} + \beta_4 * hours + \beta_5 * hours\_sq + \beta_6 * educ\_sec + \beta_7 * educ\_tert + \beta_8 * mng\_prof + \beta_9 * skill + \beta_{10} * single \quad \textbf{(ii)}$$

For Denmark, where the measurement weekly hours worked is not available, we have instead estimated the RWM using regression (iii).

$$lwage_{tot} = \beta_0 + \beta_1 * parent + \beta_2 * age + \beta_3 * age_{sq} + \beta_4 * FYFT + \beta_5 * educ\_sec + \beta_6 * educ\_tert + \beta_7 * mng\_prof + \beta_8 * skill + \beta_9 * single \quad \textbf{(iii)}$$

We believe the inclusion of the "FYFT" variable will suffice as a control, as weekly hours worked and a dummy for full year, full time employment ought to capture the same effects. Hence, the interpretation will not differ when comparing to the other nations.

Further specifications for the variables used in the regressions can be found in Tables A7 and A8 in **10. Appendix.**

The methodology for calculating the RWM is mainly based on Becker's human capital theory (Becker 1991, Chapter 2) described previously. This is taken into account with the variables for weekly hours worked, the occupational status dummies, and the dummies for highest level of completed education. The "Single" variable partly pertains to the allocation of work-effort theory (Becker 1991, Supplement to chapter 2), as it is probable that being single limits the effort possible to exert at work, as well as how flexible an employee can be with regards to occupations requiring odd work hours or much travel.

The regressions for the attempt of capturing the relationship between the RWM and the different explanatory variables described in **4.2. Variables** above, are provided in Tables A9 and A10 in **10. Appendix**.

# 5. Results

The results section starts with a summary statistics section for the LMEs and CMEs, respectively, as well as for the whole set of countries. Thereafter, an overview of the findings on the RWM in the countries analyzed is presented, which is followed by tables covering the relationship between the four measures and the VoC dichotomy as well as their relationship to the RWM. The section concludes with a table displaying the results for the RWM in connection to the independent variables for the larger set of country-year observations, including nations outside the VoC framework.

## 5.1. Summary statistics

In Tables 3-6 below, summary statistics for the LMEs and CMEs, as well as the whole set of countries, can be seen. There is a separate summary statistics table for Denmark as that regression includes the variable "FYFT" as a substitute for "hours" and "hours_sq". One thing that can be noticed is that the average amount of observations is greater in the LMEs than in the CMEs. This is an effect of the LMEs, on average, being larger than the CMEs. The distribution of the variable "parent" is quite similar between the LMEs and the CMEs, and the same goes for the variables capturing education level.

Table 3. Summary statistics for the LMEs

| LMEs | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **lwage_tot** | 10079.00 | 9.889385 | 0.954955 | 3.002895 | 13.23987 |
| **parent** | 10086.05 | 0.305525 | 0.455525 | 0 | 1 |
| **age** | 10086.05 | 38.74204 | 12.57892 | 18 | 64 |
| **age_sq** | 10086.05 | 1661.672 | 1037.088 | 324 | 4096 |
| **hours** | 9339.316 | 34.03811 | 12.02064 | 0.431579 | 89.57895 |
| **hours_sq** | 9339.316 | 1308.574 | 845.3863 | 0.492632 | 8291.474 |
| **educ_sec** | 10086.05 | 0.394922 | 0.475889 | 0 | 1 |
| **educ_tert** | 10086.05 | 0.478782 | 0.486349 | 0 | 1 |
| **mng_prof** | 10086.05 | 0.260712 | 0.369008 | 0 | 0.789474 |
| **skill** | 10086.05 | 0.469606 | 0.386045 | 0 | 0.789474 |
| **single** | 10086.05 | 0.658227 | 0.467240 | 0 | 1 |

Table 4. Summary statistics for the CMEs

| CMEs | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **lwage_tot** | 2427.625 | 10.70212 | 0.935182 | 4.292035 | 13.24403 |
| **parent** | 2430.750 | 0.263531 | 0.432174 | 0 | 1 |
| **age** | 2430.750 | 39.23030 | 12.74719 | 18.08333 | 64 |
| **age_sq** | 2430.750 | 1707.459 | 1043.696 | 327.0833 | 4096 |
| **hours** | 2278.542 | 33.71756 | 11.97806 | 1.466667 | 92.01667 |
| **hours_sq** | 2278.542 | 1290.475 | 827.5174 | 3.3225 | 8526.037 |
| **educ_sec** | 2430.750 | 0.496412 | 0.487694 | 0 | 1 |
| **educ_tert** | 2430.750 | 0.337790 | 0.462414 | 0 | 1 |
| **mng_prof** | 2430.750 | 0.253450 | 0.428748 | 0 | 1 |
| **skill** | 2430.750 | 0.620961 | 0.478557 | 0 | 1 |
| **single** | 2430.750 | 0.689752 | 0.455023 | 0 | 1 |

Table 5. Summary statistics for Denmark (CME)

| Denmark | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **lwage_tot** | 24279.75 | 12.29871 | 0.745241 | 4.893889 | 15.35215 |
| **parent** | 24279.75 | 0.289096 | 0.453330 | 0 | 1 |
| **age** | 24279.75 | 40.92055 | 13.10126 | 18 | 64 |
| **age_sq** | 24279.75 | 1846.363 | 1102.595 | 324 | 4096 |
| **fyft** | 24279.25 | 0.576893 | 0.493620 | 0 | 1 |
| **educ_sec** | 24279.75 | 0.427200 | 0.494207 | 0 | 1 |
| **educ_tert** | 24279.75 | 0.380484 | 0.483908 | 0 | 1 |
| **mng_prof** | 24279.75 | 0.250969 | 0.419452 | 0 | 1 |
| **skill** | 24279.75 | 0.571360 | 0.489195 | 0 | 1 |
| **single** | 24279.75 | 0.721376 | 0.448245 | 0 | 1 |

Table 6. Summary statistics for the whole set of countries (excluding Denmark)

| Whole set of countries (excl. Denmark) | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| **lwage_tot** | 4716.613 | 10.55727 | 0.930139 | 4.649482 | 13.37837 |
| **parent** | 4743.738 | 0.303856 | 0.442952 | 0 | 1 |
| **age** | 4743.738 | 38.49494 | 12.11374 | 18.2 | 63.95 |
| **age_sq** | 4743.738 | 1637.791 | 992.6243 | 331.625 | 4089.675 |
| **hours** | 4516.750 | 35.82519 | 11.51415 | 1.6675 | 90.28375 |
| **hours_sq** | 4516.750 | 1432.679 | 842.1742 | 6.01375 | 8286.939 |
| **educ_sec** | 4743.738 | 0.440682 | 0.470013 | 0 | 1 |
| **educ_tert** | 4743.738 | 0.349400 | 0.457528 | 0 | 1 |
| **mng_prof** | 4743.738 | 0.237916 | 0.404431 | 0 | 0.95 |
| **skill** | 4743.738 | 0.595798 | 0.453383 | 0 | 0.95 |
| **single** | 4743.738 | 0.663857 | 0.459967 | 0 | 1 |

## 5.2. Overview of the results

Table 7 below shows an example of the regression for the RWM in an individual country, in this case United Kingdom (UK) in year 2007. The individual regressions for each country and year can be made available upon request.

Table 7. An example of an individual country-regression for the RWM (UK 2007)

| **Country** | **UK** |
|---:|---:|
| **Year** | 2007 |
| **Parent** | -0.0674523*** (0.0241669) |
| **Age** | 0.0653608*** (0.0044869) |
| **Age squared** | -0.0007506*** (0.0000556) |
| **Hours** | 0.080577*** (0.0027229) |
| **Hours squared** | -0.0006864*** (0.0000407) |
| **Secondary education** | 0.1000384*** (0.0235053) |
| **Tertiary education** | 0.374782*** (0.0290579) |
| **Manager/professional** | 0.549505*** (0.0295464) |
| **Skilled labor** | 0.2745661*** (0.0209505) |
| **Single** | -0.0132691 (0.0145162) |
| **Constant** | 5.931467*** (0.0809638) |
| ***R-squared*** | *0.5218* |
| ***n*** | *7492* |

In Figures 3 and 4 below, a graphical presentation of the relative wages of mothers on a year basis is presented for the VoC set of countries and the full set of countries, respectively. Explanations for country codes can be found in Table A11 in **10. Appendix**.

When examining the RWM through a multiple regression for the countries studied, we find a significant wage penalty in most observed nations within the VoC framework (see Figure 3). However, looking at the possible correlation between the RWM and the dichotomy, we do not discover a significant difference between the two types of economies. This could be due to the fact that we only make use of data for 13 countries, although for several years, making it difficult to see distinct discrepancies. What can be noted, though, is that the dispersion of the

RWM seems to be larger for the CMEs (blue circle), than the LMEs (red square).

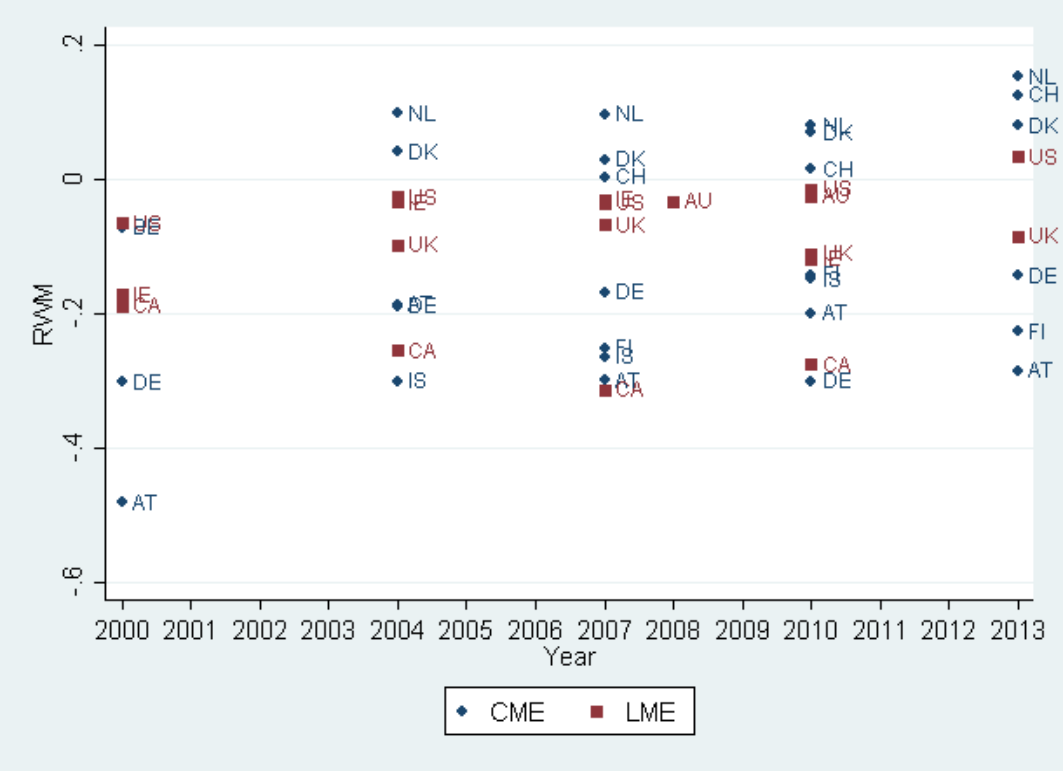


Figure 3. Graphical representation of the country-year RWM for the VoC-countries

A total of 13 observations in the extended sample (see Figure 4) show a wage premium for working mothers with young children. Eight of these results come from the years analyzed in Denmark and the Netherlands, being the only countries consistently exhibiting such a pattern. The other positive results are found in individual years for Switzerland, the Czech Republic, Estonia, Mexico, Slovakia, and the United States. All other country-year data points consecutively show a penalization of mothers with regards to their wages.

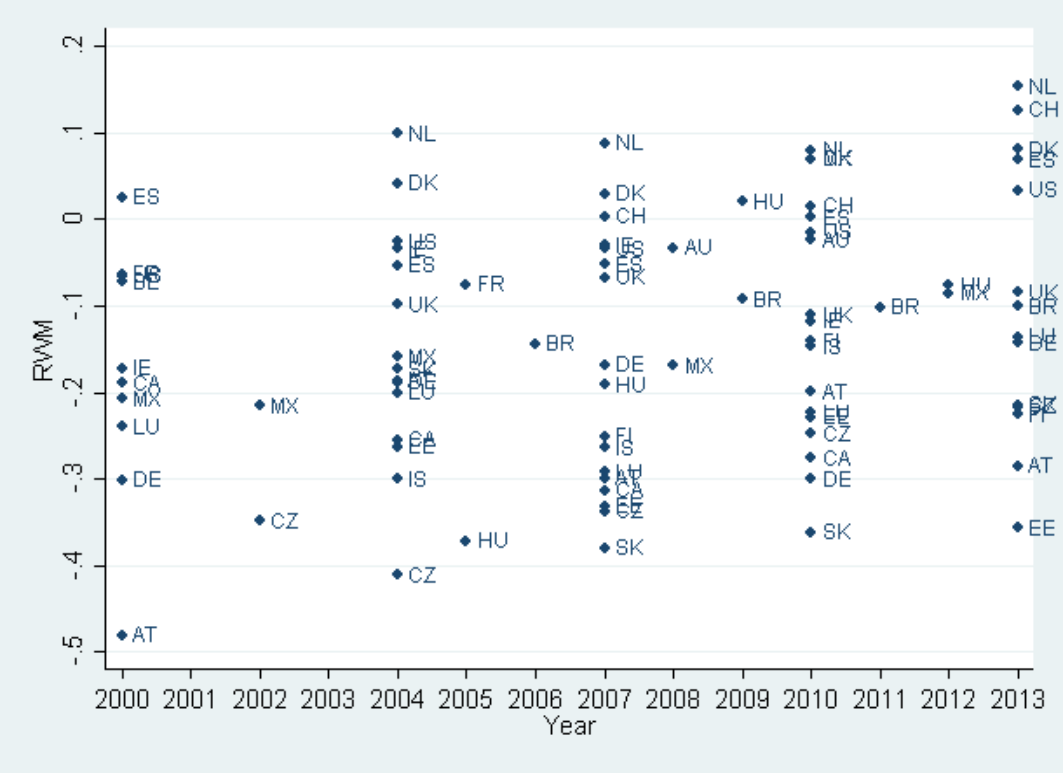


Figure 4. Graphical representation of the country-year RWM for the full set of countries

### 5.3. Relationship between the explanatory variables and the Varieties of Capitalism framework

As presented in Table 8 below, there is a significant relationship between the VoC-dichotomy (represented by the LME dummy variable) and the independent variables on a significance level of less than 1 %. Note that the observations for Iceland have been excluded as there are no values for the coordination of wage bargaining index for Iceland in any year studied.

Wage bargaining in LMEs is less centralized, more fragmented, and occurs relatively more on individual firm level than in CMEs. The coefficient for the employment protection index implies that employment protection in general is stronger in CMEs than in LMEs. The Gini coefficient is on average higher in LMEs than in CMEs which points to a larger degree of income dispersion in LMEs than CMEs. Furthermore, LMEs tend to have lower union density than CMEs. The coefficients for LME all have the signs expected according to the VoC dichotomy.

Table 8. Shows the relationship between each of the independent variables (coordination of wage bargaining, employment protection, Gini, and union density) to the VoC-classification

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **VARIABLES** | **Coordination of wage bargaining** | **Employment protection** | **Gini** | **Union density** |
| **LME** | -2.103***<br>(0.357) | -1.399***<br>(0.135) | 0.0646***<br>(0.00664) | -0.133***<br>(0.0480) |
| **Constant** | 3.840***<br>(0.111) | 2.351***<br>(0.0812) | 0.269***<br>(0.00356) | (0.0437) |
| ***Observations*** | *44* | *44* | *44* | *44* |
| ***R-squared*** | *0.504* | *0.728* | *0.710* | *0.129* |

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

## 5.4. Results for the Varieties of Capitalism-countries

In Table 9 below the RWM has been regressed directly on the LME dummy variable without taking into account the possible effect of the other explanatory variables. As is also portrayed in Figure 3 above, there seems to be no clear difference between CMEs and LMEs when it comes to the relative wages of mothers. Just using the LME/CME-classification also has extremely low explanatory value in the variation of the relative wages of mothers looking at the R-squared of 0.002.

Table 9. Shows the relationship between the RWM and the LME dummy variable

| **VARIABLES** | **RWM** |
|---|---|
| **LME** | 0.0132<br>(0.0391) |
| **Constant** | -0.113***<br>(0.0312) |
| ***Observations*** | *47* |
| ***R-squared*** | *0.002* |

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

Table 10 further down shows the results from the multiple variable regressions performed for the VoC-classified countries between the relative wages of mothers compared to non-mothers, and the different independent variables. The first regression is done with only four explanatory variables, and then the model is expanded step by step with additional independent variables. Note that effects on the dependent variable are interpreted as changes in the relative wages of mothers in comparison with the wages of non-mothers.

In regression 1, the independent variables union density, Gini, coordination of wage bargaining, and employment protection are used to explain the extent of the RWM. Apart from employment protection, which is significant on a less than 10 % significance level, none of the coefficients for the independent variables are significant. On average, when the employment protection increases by one (1) index point, the relative wages of mothers decrease with 10.3 percentage points, holding all other variables fixed.

In regression 2, the LME dummy variable is added as an independent variable to the list of independent variables from regression 1. The coefficients for the explanatory variables are insignificant with the exception of the coefficient for the employment protection index that is significant on less than 5 % significance level. An increase by one (1) index point on average entails a decrease of 11.7 percentage points of the RWM, *ceteris paribus*.

Regressions 3-6 take various interaction effects into account, where differences in the measures' effects on the RWM depending on country type analyzed can be distinguished. The key difference that seems to emerge here is the effect of changing levels of inequality as measured by the Gini coefficient, as this variable is negatively correlated (however, lacking significance) with the RWM in CMEs and positive in LMEs. Some variables exhibit changing levels of significance when interaction effects are added, as can be seen in the table.

In the seventh and final regression, we have included all of the interaction effects. The lion's share of the explanatory variables exhibit significance on at least 10 % significance level. The coefficients for the coordination of wage bargaining, the union density interaction variable, and the coordination interaction variable are not significant on any conventional level. A one (1) percentage point increase of the union density entails, on average, a decrease of the RWM (a higher wage punishment for mothers) of 0.407 percent. A one (1) percentage point increase of the Gini coefficient on average implies a decrease in the RWM of 5.416 percent. When the employment protection index increases by one (1) index point, this implies that the comparative wages of mothers decrease by 0.168 percentage points on average, which in turn means mothers earn less compared to non-mothers. The intercept of an LME in the aggregate is 2.620 percentage points lower than a CME, indicating that mothers are worse off in LMEs as a starting point. For LMEs, an increase of one (1) percentage point of the Gini coefficient entails a 0.765 percent smaller RWM compared to a CME. For an LME in which the employment protection index increase by one (1) point, the relative wages of mothers are on average 0.276 percentage points higher than in a CME, i.e. the RWM is higher in LMEs taking into account

the employment protection index. A country for which all variables take on the value zero (0), the RWM in fact takes the form of a motherhood wage premium, averaging 1.798 percent. Explanations for the coefficients of individual variables should be comprehended based on a *ceteris paribus* premise.

Overall, the $R^2$, i.e. how much of the variation in the dependent variable, RWM, can be explained by the independent variables, increases when more explanatory variables are added. For the initial set of independent variables (regression 1), the $R^2$ is 0.081, and for the final set of independent variables (regression 7), the $R^2$ is 0.306. The same pattern of increasing explanatory value is found when studying the adjusted $R^2$ which takes into account the number of explanatory variables. The fact that the adjusted $R^2$ is negative for the first two regressions is probable to be an effect of the small sample size.

Also noteworthy is that in regression 7, when all available explanatory variables are included and held fixed, the classification of LME/CME is statistically significant in explaining the extent of the RWM. Furthermore, one possible explanation for the lack of significance for some of the variables in the different regressions could be the low number of observations (44), although this is not clear *ex ante.*

It should be noted that a Chow test on the full set of variables used in regression 7 confirms we cannot reject the null saying that there is no difference in slope or intercept for LMEs and CMEs. This looks strange at first glance, given the seemingly large differences in the coefficients for the Gini and the employment protection index relative to the corresponding interaction effects. Again, the issue could be caused by the low number of observations and degrees of freedom. Regardless, we cannot make claims regarding differences in the variables' effects on the RWM, looking only at the countries available within the framework. We will thus move on to the expanded sample, and away from the VoC framework, to see if a pattern can still be distinguished with regards to the various measures and their possible effects on the RWM.

Table 10. Displays the various variables' effects on mothers' relative wages for the VoC-classified countries.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **VARIABLES** | **RWM** | **RWM** | **RWM** | **RWM** | **RWM** | **RWM** | **RWM** |
| **Union density** | -0.223<br>(0.152) | -0.206<br>(0.162) | -0.204<br>(0.164) | -0.321*<br>(0.166) | -0.201<br>(0.174) | -0.217<br>(0.163) | -0.407*<br>(0.201) |
| **Gini** | -1.711<br>(1.213) | -1.296<br>(1.443) | -2.460<br>(1.867) | -4.788<br>(2.953) | -1.248<br>(1.572) | -1.106<br>(1.587) | -5.416*<br>(2.799) |
| **Coordination of wage bargaining** | 0.0252<br>(0.0157) | 0.0238<br>(0.0144) | 0.0333**<br>(0.0164) | 0.0343**<br>(0.0150) | 0.0167<br>(0.0447) | 0.0222<br>(0.014) | 0.0272<br>(0.0498) |
| **Employment protection** | -0.103*<br>(0.0536) | -0.117**<br>(0.0566) | -0.0817<br>(0.0688) | -0.0828<br>(0.0675) | -0.116*<br>(0.0582) | -0.139*<br>(0.081) | -0.168*<br>(0.0978) |
| **LME** | | -0.0601<br>(0.0730) | 0.299<br>(0.289) | -1.687*<br>(0.883) | -0.0895<br>(0.207) | -0.158<br>(0.224) | -2.620***<br>(0.940) |
| **Union density interaction** | | | -0.897<br>(0.589) | | | | -0.371<br>(0.373) |
| **Gini interaction** | | | | 5.725*<br>(3.352) | | | 7.650**<br>(3.146) |
| **Coordination of wage bargaining interaction** | | | | | 0.00824<br>(0.0480) | | 0.00731<br>(0.0517) |
| **Employment protection interaction** | | | | | | 0.0531 | 0.276** |
| **Constant** | 0.584<br>(0.472) | 0.511<br>(0.509) | 0.702<br>(0.552) | 1.370*<br>(0.773) | 0.519<br>(0.503) | 0.521<br>(0.508) | 1.798** |
| ***Observations*** | *44* | *44* | *44* | *44* | *44* | *44* | *44* |
| ***R-squared*** | *0.081* | *0.090* | *0.143* | *0.217* | *0.090* | *0.095* | *0.306* |
| ***Adj R-squared*** | *-0.013* | *-0.030* | *0.004* | *0.090* | *-0.057* | *-0.052* | *0.123* |

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

## 5.5. Results for the large set of countries

In Table 11 below, the RWM is used as the dependent variable and regressed on a set of explanatory variables. The data sample consists of the full country-year dataset. Countries lacking data on one or more of the explanatory variables have been excluded (for further information, see Table A1 in **10. Appendix**). All coefficients for the explanatory variables with the exception of union density are significant on at least 10 % significance level. Somewhat contradictory to previous research (Lundberg 2012), a significant relationship can be found between the Gini coefficient and the comparative wages of mothers in contrast to the wages of non-mothers. An increase of one (1) percentage point of the Gini coefficient implies an increase in the RWM of 0.504 percent on average. This means that wages of mothers are more in line with the wages of non-mothers when the income dispersion is larger. When the coordination

of wage bargaining increases by one (1) index point, i.e. wage bargaining becomes more centralized, the relative wages of mothers increases by, on average, 0.0514 percentage points, pointing to mothers being less punished with regards to their wages. A one (1) index point increase of the employment protection entails a decrease of the RWM by 0.0731 percentage points on average. More rigorous employment protection is thus associated with the wages of mothers being lower than the wages of non-mothers. Finally, for a country where all explanatory variables take on the value zero (0), the relative wages of mothers in the aggregate are 0.256 percent. Coefficients of individual variables should be interpreted holding all other independent variables fixed.

In the regression with the larger set of countries, the $R^2$ is 0.195 which means that the chosen explanatory variables are able to explain nearly one fifth of the variation in the dependent variable, the wages of mothers compared to the wages of non-mothers. The adjusted $R^2$ is slightly lower than the non-adjusted $R^2$ which may be a result of the relatively small sample size compared to the number of explanatory variables.

Table 11. Displays the various variables' effects on mothers' relative wages for the large set of countries

| VARIABLES | RWM |
|---|---|
| **Union density** | -0.0661<br>(0.114) |
| **Gini** | 0.504*<br>(0.271) |
| **Coordination of wage bargaining** | 0.0514***<br>(0.0138) |
| **Employment protection** | -0.0731***<br>(0.0179) |
| **Constant** | -0.256**<br>(0.118) |
| ***Observations*** | *78* |
| ***R-squared*** | *0.195* |
| ***Adj R-squared*** | *0.151* |

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

## 6. Discussion

The results shown in Table 10 are in some need of disentanglement. An interesting pattern emerges across the regressions, seeing as most variables exhibit a stability in sign, but not in their significance.

The variable that exhibits the greatest fluctuation across the models is the Gini coefficient. This, as well as changes for the other variables, means that the correlation between the RWM

and the Gini show distinct differences depending on which type of economy one is analyzing. The coefficient for Gini is relatively small when the interaction is not included, and relatively large when it is included. Furthermore, we notice that the effect of increasing the general level of inequality actually is beneficial for mothers when looking at LMEs and detrimental in CMEs. The fact that the general effect of the Gini coefficient as seen in the first model is negative can be a result of the skewed sample, as most countries analyzed are classified as CMEs. When looking at Table 11, we see the aggregate effect as being positive, which is more in line with the size of the interaction coefficient in comparison to the original Gini regressor.

One major caveat regarding the discussion above is the aforementioned Chow test. Even though Table 10 makes it seem like there is a discrepancy in effects, this cannot be ascertained through the data made available to us. The fact that we cannot determine whether the various measures have different effects on the RWM also implies that the highly significant coefficient for the LME dummy variable is not indicative of a generally lower RWM in those countries, again possibly being a problem stemming from the small number of observations.

Given that we do not seem to find conclusive results in Table 10, we can move on to Table 11 to examine the correlations from a broader perspective. These findings are much in line with what the smaller sample's results show, seemingly reinforcing some of the less informative results previously found. The aggregate correlations seem to be in line with the hypothesis as based on Buchmann & McDaniel (2016) coupled with Estévez-Abe (2006), meaning that when nations exhibit features more in line with the CME-type (high union density, low Gini coefficient, high coordination of wage bargaining, and strong employment protection) the situation for mothers worsens with the exception of the coefficient for the coordination measure. However, to what extent our results for CME-like countries have external validity, i.e. are applicable to nations outside the analysis, is not clear beforehand. As previously stated, it is cumbersome to analyze these results as the reasoning attempting to rationalize them builds on arguments that researchers have not been able to fully explain. The MWP is less pronounced in male-dominated professions, meaning a larger participation within these occupations ought to mitigate the wage penalty. That reasoning, in connection to what has been found with regards to occupational sex segregation and the VoC, means these results fall in line with previous research. But in order to further expand the efforts of gendering the VoC, one needs to disentangle what drives the discrepancy in the MWP within different types of occupations.

Expanding the gendering of the theory within the premises of the framework might however not be possible, given the issues we have had in establishing a clear cut pattern for the countries originally included therein. The manner in which we attempt to mitigate this issue by allowing us to ascertain the relationships between the chosen measures and the RWM works well, but unfortunately it only provides us with indications toward what we expect to see across the different types of economies. It should also be noted that only the coordination of wage bargaining and employment protection index are highly significant, and the two of them are not heading in a definite direction based on the dichotomy. The rate of unionization and the Gini coefficient do not seem to carry much explanatory power (the Gini coefficient is significant, however at the 10 % level), meaning the conclusion that mothers are more likely to be penalized in CMEs presupposes a conclusive casting vote from the Gini coefficient. This is problematic, as mentioned earlier, due to the fact that a positive correlation between increased general inequality and relatively higher wages for working mothers is very difficult to vindicate. Further research is needed to examine these results to disentangle why this (rather strange) phenomenon appears in our data.

In connection to this, it is appropriate to mention the criticism put forth by Rubery (2009) in response to Estévez-Abe (2006). It is argued that the dichotomous framework is not useful in a discussion of women's participation in the labor market, due to the fact that most of the variation observed occurs within the CMEs, not across the two types of capitalism as originally laid out. This piece of criticism also seems relevant to a discussion of the MWP, as one can see when examining Figure 3. Most of the variation in mothers' relative wages occur within the CMEs, with Canada being the main outlier on the LME side. Their criticism, coupled with the results provided by Table 10, make the case for further research within CMEs (and possibly CME-like nations) with a focus on the variables that seem to carry the largest amount of explanatory power (coordination of wage bargaining, Gini coefficient, and the level of employment protection) in order to better ascertain or reject the correlations found in this paper.

Making an effort to determine causality between the measures and the RWM is also of interest, since it carries with it important implications with regards to policy adjustment pertaining to e.g. what level of employment protection or level of wage bargaining is appropriate to strengthen mothers' relative positions in the labor force. However, it is important to note that possible policy adjustments would have to be preceded by normative discussions regarding implications from such changes. Given that the correlations with regards to the MWP are in

line with what is found pertaining to occupational sex segregation (Estévez-Abe 2006), this does however strengthen the argument for having such conversations.

Finally, this thesis explores the MWP in a way that is relatively unique, with a focus on institutional settings and a framework which has not generally been subject to exploration of gender issues. We believe this study lays the foundations for more in-depth analyses, with the aforementioned focus on CMEs being a possible area for further research. Another area of interest is to investigate whether the fatherhood wage premium is as persistent a feature as the MWP, and whether the size of these male wage discrepancies can be related to the framework. In addition, it could be worthwhile to account for a possible re-categorization of some the VoC-countries within a larger time frame given that the framework was developed in 2001 and a lot of large, societal changes have taken place since then, for example due to the financial crisis, possibly changing the institutions that motivates the dichotomy's division. Another possible idea for further research is also to include more to than two country-classifications, such as the framework elaborated by Schneider and Paunescu (2012) that builds on the Varieties of Capitalism framework but contains five different categories rather than two, with a time-varying aspect. However, the problem with small sample size is probable to persist.

## 7. Limitations

Several factors pose as limitations for our thesis and our results. They will be reviewed below.

### 7.1. Lack of longitudinal data

Although the obtained dataset provides us with individual-level data, it lacks the longitudinal aspect. This prevents us from researching the wage development of mothers compared to non-mothers, i.e. the causal effect of becoming a mother on the wage. Instead, our thesis takes the form of a correlation study. Also, we are unable to resolve the eventual endogeneity problem, consisting of the risk that some women choose to become mothers just because they feel they have bad prospective outcomes on the labor market. The MWP is then not a consequence of motherhood in itself, but rather of some inherent characteristics of the females choosing to become mothers that would have led them to earn less regardless. This could have been taken into account through for example a fixed-effects model. An instrumental variable-method could be used to solve the issue of endogeneity. However, it is difficult to find such variables

given that it needs to be correlated with all explanatory variables whilst at the same time lacking correlation with the error term. This task is beyond the scope of our thesis.

### 7.2. Lack of variables

Yet another limitation pertains to the lack of data availability for several desired variables, such as years of work experience and tenure, which potentially has a large effect on an individual's wage and should, in an optimal setting, be tested for. However, many datasets for a large number of countries and years do not contain these variables. A proxy variable for working experience could be coded as the difference between an individual's age at the time of the survey and the age upon completion of education, the approach put to use by Lundberg (2012). The measure is imperfect and unable to account for periods of unemployment or sickness and hence, might not have added much explanatory value. For some countries, years of total work experience actually is available. Comparing the output for the regressions with work experience accounted for and the regressions without it shows that taking work experience into consideration does not change the estimated coefficients much. For example, for Canada in 2007, the RWM is -0.3135146 without account work experience, and -0.3004668 with it. The same pattern of small changes seems to exist for other countries where the variable is accessible. Also, the coefficients are not consistently larger or smaller, so the potential bias created by the lack of work experience has no clear direction.

In addition, we do not know if the samples are "balanced" with regards to the children's ages. We know that females with children in the age range of 0–6 fall within a certain category, but we don't know the exact age of the children within that sample. However, as the survey data LIS build on in all likelihood constitute representative samples of the population this should not pose a large issue.

### 7.3. Different years of data

The data from the OECD countries have not been collected at the same time. In our attempt to increase the sample size of our VoC-dataset as well as the full-country dataset, we have included as many observations as possible for each country. This means our data points for the RWM and the explanatory variables lie within the years 2000–2013. For the larger set of countries, this should not pose a problem as we are stepping outside the VoC framework. As

discussed in **7.5. Static classification** below, given the static classification, it is possible that this can partly explain our inconclusive results.

### 7.4. Small sample

The results presented in parts **5.1**–**5.5** is based on a relatively small number of observations, which might give rise to issues when making cross-national comparisons. This means it might be difficult to draw substantial conclusions on the level of difference in the RWM across the CME- and LME countries. The small sample size can also cause problems when it comes to hypothesis testing as the CLM assumptions require the standard errors to be normally distributed which is not perfectly the case as presented by Figures 1 and 2. If the sample is "large" (generally this implies N >100), the assumption can be considered to hold without further investigation. However, as the null hypotheses of normally distributed standard errors from the Jarque-Bera tests cannot be rejected, this will likely not affect our results.

### 7.5. Static classification

The classification of a country as an LME or CME has been adapted from Hall and Soskice (2001). We have chosen not to deviate from the original classification from 2001 (shown in Table 1), although it's possible that one or a few of the classified countries should be re-classified as a result of major macroeconomic and societal changes in the past years. If in fact a country should be re-categorized, then our results will be somewhat biased or more inconclusive than they could have been and may explain part of why the framework does not appear to have a direct correlation to the relative wages of mothers as shown in Table 9. One reason for not re-classifying countries comes from the fact that institutions change slowly and it's uncertain whether the institutions in a given country will have changed so much within our time scope (2000–2013) as to motivate a re-classification. Considered in part **6. Discussion** as an idea for further research is attempting to re-classify some of the countries, or adapting a more extensive framework with more than two classifications (see e.g. Schneider, Paunescu 2012).

### 7.6. Choice of variables

The manner in which we have chosen the variables used in the regressions for the RWM is based mainly on Lundberg (2012) as also he used the LIS database. However, the LIS datasets

include a large number of variables and it is possible that we have disregarded some that potentially are informative in explaining the relative wages of mothers compared to non-mothers. Leaving out important variables creates omitted-variable bias (OVB), which implies that the model over- or underestimates the effect of one of the other independent variables. In addition. OVB violates the OLS-assumptions of zero correlation between the independent variables and the error term. Nevertheless, given the aforementioned variable constraint (see **7.2 Lack of variables**), we cannot rationalize the use of other explanatory variables.

As previously discussed, the wages of non-mothers are compared to the wages of mothers with one child, or more, in the age range 0–6. However, the available data does not render us with the possibility to control for how many children a woman has and it is thinkable, in line with the predictions from the allocation of work effort theory, that mothers with more than one child are more severely punished than mothers with only one child. Part of the calculated wage penalty is in that case not an effect of being a mother or not, but instead an effect of *how many* children a mother has. On the other hand, one of the main takeaways from the allocation of work effort theory is that mothers are limited from taking employment requiring long work hours or much travelling. As we control for both the occupational status and weekly hours worked, we are most likely to capture this effect nonetheless.

Another important thing to mention is the usage of coefficients as main basis for the second step of the analysis. As these coefficients are estimations of the correlation between motherhood and wage discrepancies, the analysis could be flawed if the actual wage disparities differ from the estimated ones within the confidence interval. This issue could be mitigated by the usage of larger sample sizes, as the standard errors (and thus, the confidence interval) would shrink.

## 8. Concluding remarks

This thesis attempts to further elaborate the gender aspects of the Varieties of Capitalism framework, developed by Hall and Soskice (2001), as well as the institutional elements of the MWP. This is of interest as policy changes attempting to correct this wage discrimination of mothers need to take into account and understand the institutions they are meant to affect.

Building on previous research on the MWP as well as gender aspects of the Varieties of Capitalism framework we formulate a hypothesis predicting a larger MWP in countries classified as CMEs. We use data from the LIS database to calculate the relative wages of

mothers compared to non-mothers for a large set of countries and years. Our results show and reinforce previous findings of the MWP, as we find a significant discrepancy between the wages of mothers and non-mothers for the majority of the country-year observations. However, we do not find evidence for the two types of capitalism being predictors of the extent of the MWP. Furthermore, the CMEs exhibit the largest amount of variation concerning the MWP.

To expand the scope, we take a step outside the framework and look at individual features behind the VoC-classification such as the Gini coefficient, trade union density, strength of employment protection, and the level of coordination of wage bargaining. Additionally, we construct a larger data set including countries both within and outside the framework to see whether a more distinct pattern can be discerned between the relative wages of mothers compared to non-mothers and the aforementioned components.

We observe significant relationships between three out of four utilized framework measures and the MWP when conducting an analysis outside the borders of the VoC. On the aggregate, these results are in line with what has been found in research on occupational sex segregation, i.e. that mothers are seemingly worse off in countries exhibiting characteristics more in line with the CME-type, based on how these measures differ across the dichotomous framework. This conclusion is based on the Gini coefficient being positively correlated with higher relative wages for mothers - given that the coefficients for the employment protection index and the coordination of wage bargaining measure move in opposite directions - for which it is difficult to find an intuitive explanation.

To reconnect to the research questions at hand, the presence and extent of the MWP does not seem to be related to the VoC framework. There is however a relationship between the aggregate set of independent variables (characteristics) and the MWP, namely that the MWP worsens when the measures take on values more aligned with the CME type.

Some areas we believe are of interest for future research is further investigating the difference within CMEs with regards to the MWP, as well as re-classifying countries within the framework over time as suitable or adapting a more extensive framework with more than two categorizations.

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# 10. Appendix

Table A1. Data on the Gini coefficient, the trade union density, the employment protection index, the coordination of wage bargaining index, and the RWM for the entire sample of countries

| Country | Year | Gini | Union density | Employment protection index | Coordination of wage bargaining index | RWM |
|---|---|---|---|---|---|---|
| **AT** | *2000* | 0.279 | 0.374 | 2.75 | 4 | -0.4812324*** |
| | *2004* | 0.279 | 0.349 | 2.37 | 4 | -0.1860735** |
| | *2007* | 0.284 | 0.305 | 2.37 | 4 | -0.2991422*** |
| | *2010* | 0.269 | 0.29 | 2.37 | 4 | -0.1991162*** |
| | *2013* | 0.257 | 0.278 | 2.37 | 4 | -0.2850582*** |
| **AU** | *2008* | 0.33 | 0.186 | 1.17 | 2 | -0.0330568 |
| | *2010* | 0.33 | 0.184 | 1.67 | 2 | -0.0243876 |
| **BE** | *2000* | 0.28 | 0.562 | 1.85 | 5 | -0.0720957 |
| **BR** | *2006* | 0.45 | No data | 1.43 | 3 | -0.1437082*** |
| | *2009* | 0.46 | No data | 1.43 | 3 | -0.0929997*** |
| | *2011* | 0.47 | No data | 1.43 | 3 | -0.1021147*** |
| | *2013* | 0.49 | No data | 1.53 | 3 | -0.1005067 *** |
| **CA** | *2000* | 0.315 | 0.28 | 0.92 | 1 | -0.1889037*** |
| | *2004* | 0.318 | 0.278 | 0.92 | 1 | -0.2552653*** |
| | *2007* | 0.315 | 0.273 | 0.92 | 1 | -0.3135146*** |
| | *2010* | 0.317 | 0.272 | 0.92 | 1 | -0.276183*** |
| **CH** | *2007* | 0.273 | 0.185 | 1.60 | 3 | 0.0033922 |
| | *2010* | 0.268 | 0.171 | 1.60 | 3 | 0.0157023 |
| | *2013* | 0.311 | 0.162 | 1.60 | 3 | 0.1263967** |
| **CZ** | *2002* | 0.255 | 0.222 | 3.31 | 2 | -0.3484196*** |
| | *2004* | 0.266 | 0.21 | 3.31 | 2 | -0.4112626*** |
| | *2007* | 0.251 | 0.179 | 3.05 | 2 | 0.3376567*** |
| | *2010* | 0.256 | 0.166 | 3.05 | 2 | -0.247738*** |
| | *2013* | 0.258 | 0.127 | 2.92 | 2 | -0.2162954*** |
| **DE** | *2000* | 0.266 | 0.246 | 2.68 | 3 | -0.3017373*** |
| | *2004* | 0.278 | 0.222 | 2.68 | 4 | -0.1879459*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | *2007* | 0.289 | 0.199 | 2.68 | 4 | -0.1678509*** |
| | *2010* | 0.285 | 0.186 | 2.68 | 4 | -0.3007176*** |
| | *2013* | 0.291 | 0.181 | 2.68 | 4 | -0.1434409*** |
| **DK** | *2004* | 0.228 | 0.704 | 2.13 | 4 | 0.0417024*** |
| | *2007* | 0.238 | 0.679 | 2.13 | 4 | 0.0292726*** |
| | *2010* | 0.248 | 0.67 | 2.13 | 4 | 0.0693731*** |
| | *2013* | 0.249 | 0.668 | 2.20 | 4 | 0.0806681*** |
| **EE** | *2004* | 0.347 | 0.11 | 2.74 | 2 | -0.2630324*** |
| | *2007* | 0.312 | 0.076 | 2.74 | 2 | -0.3316711*** |
| | *2010* | 0.319 | 0.082 | 1.81 | 1 | -0.2285327*** |
| | *2013* | 0.352 | 0.057 | 1.81 | 1 | -0.3563053*** |
| **ES** | *2000* | 0.336 | 0.166 | 2.36 | 2 | 0.025443 |
| | *2004* | 0.316 | 0.154 | 2.36 | 4 | -0.0531211* |
| | *2007* | 0.307 | 0.155 | 2.36 | 4 | -0.524037* |
| | *2010* | 0.333 | 0.173 | 2.36 | 3 | 0.0022791 |
| | *2013* | 0.343 | 0.169 | 2.05 | 3 | 0.069228* |
| **FI** | *2007* | 0.264 | 0.705 | 2.17 | 3 | -0.2507122*** |
| | *2010* | 0.261 | 0.686 | 2.17 | 3 | -0.1413206*** |
| | *2013* | 0.259 | 0.69 | 2.17 | 5 | -0.2259886*** |
| **FR** | *2000* | 0.278 | 0.08 | 2.34 | 2 | -0.0637504** |
| | *2005* | 0.28 | 0.077 | 2.47 | 2 | -0.0753791*** |
| **HU** | *2005* | 0.289 | 0.175 | 2.00 | 2 | -0.3713654** |
| | *2007* | 0.274 | 0.151 | 2.00 | 2 | -0.191179 |
| | *2009* | 0.278 | 0.139 | 2.00 | 2 | 0.0206585 |
| | *2012* | 0.289 | 0.107 | 2.00 | 1 | -0.0761166 |
| **IE** | *2000* | 0.313 | 0.38 | 1.44 | 5 | -0.1717038** |
| | *2004* | 0.317 | 0.355 | 1.44 | 5 | -0.0340434 |
| | *2007* | 0.297 | 0.315 | 1.27 | 5 | -0.0302948 |
| | *2010* | 0.294 | 0.327 | 1.27 | 1 | -0.1180327** |
| **IS** | *2004* | 0.255 | 0.84 | 1.73 | No data | -0.3003194*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | *2007* | 0.276 | 0.848 | 1.73 | No data | -0.2636065*** |
| | *2010* | 0.245 | 0.854 | 1.73 | No data | -0.147931** |
| **LU** | *2000* | 0.262 | 0.425 | 2.25 | 2 | -0.2399882*** |
| | *2004* | 0.269 | 0.423 | 2.25 | 2 | -0.2008724*** |
| | *2007* | 0.276 | 0.387 | 2.25 | 2 | -0.2922799*** |
| | *2010* | 0.271 | 0.351 | 2.25 | 2 | -0.2231461*** |
| | *2013* | 0.283 | No data | 2.25 | 5 | -0.1362691*** |
| **MX** | *2000* | 0.486 | 0.156 | 2.19 | 1 | -0.2072046*** |
| | *2002* | 0.468 | 0.159 | 2.19 | 1 | -0.215863*** |
| | *2004* | 0.457 | 0.175 | 2.19 | 1 | -0.1595627*** |
| | *2008* | 0.469 | 0.157 | 2.19 | 1 | -0.1688203*** |
| | *2010* | 0.455 | 0.144 | 2.19 | 1 | 0.0696686** |
| | *2012* | 0.459 | 0.136 | 2.19 | 1 | -0.0858287* |
| **NL** | *2004* | 0.266 | 0.208 | 2.88 | 4 | 0.0990931*** |
| | *2007* | 0.274 | 0.193 | 2.88 | 4 | 0.0878639*** |
| | *2010* | 0.257 | 0.186 | 2.82 | 4 | 0.0799459*** |
| | *2013* | 0.264 | 0.178 | 2.82 | 4 | 0.1534513*** |
| **SK** | *2004* | 0.269 | 0.236 | 2.22 | 1 | 0.1733448*** |
| | *2007* | 0.248 | 0.188 | 2.22 | 2 | -0.3798313*** |
| | *2010* | 0.262 | 0.152 | 2.22 | 2 | -0.3618429*** |
| | *2013* | 0.268 | 0.133 | 1.84 | 3 | -0.214688*** |
| **UK** | *2004* | 0.344 | 0.29 | 1.26 | 1 | -0.0981438*** |
| | *2007* | 0.339 | 0.281 | 1.26 | 1 | -0.0674523*** |
| | *2010* | 0.334 | 0.266 | 1.26 | 1 | -0.1107778*** |
| | *2013* | 0.33 | 0.258 | 1.10 | 1 | -0.0841568*** |
| **US** | *2000* | 0.357 | 0.128 | 0.26 | 1 | -0.0655971*** |
| | *2004* | 0.364 | 0.12 | 0.26 | 1 | -0.0260146* |
| | *2007* | 0.371 | 0.116 | 0.26 | 1 | -0.034274*** |
| | *2010* | 0.367 | 0.114 | 0.26 | 1 | -0.0147431 |
| | *2013* | 0.377 | 0.108 | 0.26 | 1 | 0.0332407** |

Table A2. Representation of ISCO-08 (major group, and sub-major groups) (LIS Data Waves VII onwards, i.e. year 2009 onwards). Adapted from ISCO (ISCO 2010)

| **ISCO-08 Major Group Code** | **Sub-major groups** |
|---|---|
| 1 Managers | • Chief Executives. Senior Officials. and Legislators<br>• Administrative and Commercial Managers<br>• Production and Specialized Services Managers<br>• Hospitality. Retail. and Other Services Managers |
| 2 Professionals | • Science and Engineering Professionals<br>• Health Professionals<br>• Teaching Professionals<br>• Business and Administration Professionals<br>• Information and Communications Technology Professionals<br>• Legal. Social. and Cultural Professionals |
| 3 Technicians and Associate Professionals | • Science and Engineering Associate Professionals<br>• Health Associate Professionals<br>• Business and Administration Associate Professionals<br>• Legal. Social. Cultural. and Related Associate Professionals<br>• Information and Communications Technicians |
| 4 Clerical Support Workers | • General and Keyboard Clerks<br>• Customer Services Clerks<br>• Numerical and Material Recording Clerks<br>• Other Clerical Support Workers |
| 5 Services and Sales Workers | • Personal Services Workers<br>• Sales Workers<br>• Personal Care Workers<br>• Protective Services Workers |
| 6 Skilled Agricultural. Forestry. and Fishery Workers | • Market-oriented Skilled Agricultural Workers<br>• Market-oriented Skilled Forestry. Fishery. and Hunting Workers<br>• Subsistence Farmers. Fishers. Hunters. and Gatherers |
| 7 Craft and Related Trades Workers | • Building and Related Trades Workers (excluding electricians)<br>• Metal. Machinery. and Related Trades Workers<br>• Handicraft and Printing Workers<br>• Electrical and Electronics Trades Workers<br>• Food Processing. Woodworking. Garment. and Other Craft and Related Trades Workers |
| 8 Plant and Machine Operators and Assemblers | • Stationary Plant and Machine Operators<br>• Assemblers<br>• Drivers and Mobile Plant Operators |
| 9 Elementary Occupations | • Cleaners and Helpers<br>• Agricultural. Forestry. and Fishery Laborers<br>• Laborers in Mining. Construction. Manufacturing. and Transport<br>• Food Preparation Assistants<br>• Street and Related Sales and Services Workers<br>• Refuse Workers and Other Elementary Workers |

Table A3. Representation of ISCO-88 (major group, and sub-major groups) (LIS Data Waves I-VII, i.e. years 1978-2008). Adapted from ISCO (ISCO 2010)

| **ISCO-88 Major group code** | **Sub-major groups** |
|---|---|
| 1 Legislators. Senior Officials. and Managers | • Legislators and Senior Officials<br>• Corporate Managers<br>• General Managers |
| 2 Professionals | • Physical. Chemists. and Related Professionals<br>• Life Science and Health Professionals<br>• Teaching Professionals<br>• Other Professionals |
| 3 Technicians and Associate Professionals | • Physical and Engineering Science Associate Professionals<br>• Life Science and Health Associate Professionals<br>• Teaching Associate Professionals<br>• Other Associate Professionals |
| 4 Clerks | • Office Clerks<br>• Customer Services Clerks |
| 5 Service Workers and Shop and Market Sales Workers | • Personal and Protective Services Workers<br>• Models. Salespersons. and Demonstrators |
| 6 Skilled Agricultural and Fishery Workers | • Market-oriented Skilled Agricultural and Fishery Workers<br>• Subsistence Agricultural and Fishery Workers |
| 7 Craft and Related Trades Workers | • Extraction and Building Trades Workers<br>• Metal. Machinery. and Related Trades Workers<br>• Precision. Handicraft. Printing. and Related Trades Works<br>• Other Craft and Related Trades Workers |
| 8 Plant and Machine Operators and Assemblers | • Stationary-plant and Related Operators<br>• Machine Operators<br>• Drivers and Mobile-plant Operators |
| 9 Elementary Occupations | • Sales and Services Elementary Occupations<br>• Agricultural. Fishery and Related Laborers<br>• Laborers in Mining. Construction. Manufacturing. and Transport |

Table A4. Table of the measures for the employment protection index. Adapted from the OECD Employment Protection Database

| Note: Version 1 of the employment protection index used<br>*All indicators expressed on a scale of 0-6* | | | | |
|---|---|---|---|---|
| **Level 1** | **Level 2** | **Level 3** | **Level 4** | *Weight* |
| Regular contracts including additional provision for collective dismissals | Regular contracts (weight 1) | Procedural inconvenience (weight 1/3) | Notification procedures | 1/2 |
| | | | Delay involved before notice can start | 1/2 |
| | | Notice and severance pay for no-fault individual dismissal (weight 1/3) | Length of the notice period at 9 months tenure | 1/7 |
| | | | Length of the notice period at 4 years tenure | 1/7 |
| | | | Length of the notice period at 20 years tenure | 1/7 |
| | | | Severance pay at 9 months tenure | 4/21 |
| | | | Severance pay at 4 years tenure | 4/21 |
| | | | Severance pay at 20 years tenure | 4/21 |
| | | Difficulty of dismissal (weight 1/3) | Definition of justified or unfair dismissal | 1/4 |
| | | | Length of trial period | 1/4 |
| | | | Compensation following unfair dismissal | 1/4 |
| | | | Possibility of reinstatement following unfair dismissal | 1/4 |
| | | | Maximum time to make a claim of unfair dismissal | - |

Table A5. Shows the correlation between the independent variables (Gini, union density, employment protection, coordination of wage bargaining, LME, and the interaction variables) for the VoC-set of countries

| | **Gini** | **Union density** | **Employment protection** | **Coordination of wage bargaining** | **LME** | **Gini interaction** | **Union density interaction** | **Employment protection interaction** | **Coordination of wage bargaining interaction** |
|---|---|---|---|---|---|---|---|---|---|
| **Gini** | 1.00 | | | | | | | | |
| **Union density** | -0.61 | 1.00 | | | | | | | |
| **Employment protection** | -0.83 | 0.29 | 1.00 | | | | | | |
| **Coordination of wage bargaining** | -0.73 | 0.41 | 0.75 | 1.00 | | | | | |
| **LME** | 0.84 | -0.36 | -0.85 | -0.71 | 1.00 | | | | |
| **Gini interaction** | 0.88 | -0.38 | -0.88 | -0.73 | 1.00* | 1.00 | | | |
| **Union density interaction** | 0.61 | -0.19 | -0.65 | -0.50 | 0.90 | 0.86 | 1.00 | | |
| **Employment protection interaction** | 0.55 | -0.17 | -0.52 | -0.43 | 0.84 | 0.80 | 0.94 | 1.00 | |
| **Coordination of wage bargaining interaction** | 0.43 | -0.12 | -0.44 | 0.00 | 0.67 | 0.64 | 0.77 | 0.76 | 1.00 |

*0.9955

Table A6. Shows the correlation between the independent variables (Gini, union density, employment protection, and coordination) for the full set of countries

| | **Gini** | **Union density** | **Employment protection** | **Coordination of wage bargaining** |
|---|---|---|---|---|
| **Gini** | 1.00 | | | |
| **Union density** | 0.40 | 1.00 | | |
| **Employment protection** | 0.46 | 0.04 | 1.00 | |
| **Coordination of wage bargaining** | -0.52 | -0.35 | -0.41 | 1.00 |

Table A7. Specifications for variables used in regressions for RWM (excluding Denmark)

| **Variable** | **Specification** |
|---|---|
| lwage_tot | The log of the annual income from labor |
| parent | A dummy variable taking on the value 1 if an individual has a child between 0-6 years old, and 0 if an individual has no children |
| age | A person's age at the time of the survey |
| age_sq | A person's age at the time of the survey, squared |
| hours | Weekly hours worked given by the respondent |
| hours_sq | Weekly hours worked given by the respondent. squared |
| educ_sec | A dummy variable taking on the value 1 if an individual has completed secondary education, and 0 otherwise |
| educ_tert | A dummy variable taking on the value 1 if an individual has completed tertiary education (college/university), and 0 otherwise |
| mng_prof | A dummy variable taking on the value 1 if an individual holds a professional or managerial occupation, and 0 otherwise |
| skill | A dummy variable taking on the value 1 if an individual works as a "skilled laborer," and 0 otherwise |
| single | A dummy variable taking on the value 1 if an individual lives with a partner, and 0 otherwise |

Table A8. Specifications for variables used in regressions for RWM (for Denmark)

| **Variable** | **Specification** |
|---|---|
| lwage_tot | The log of the annual income from labor |
| parent | A dummy variable taking on the value 1 if an individual has a child between 0-6 years old, and 0 if an individual has no children |
| age | A person's age at the time of the survey |
| age_sq | A person's age at the time of the survey, squared |
| FYFT | A dummy taking on the value 1 if an individual has worked full year full time, and 0 otherwise. |
| educ_sec | A dummy variable taking on the value 1 if an individual has completed secondary education, and 0 otherwise |
| educ_tert | A dummy variable taking on the value 1 if an individual has completed tertiary education (college/university), and 0 otherwise |
| mng_prof | A dummy variable taking on the value 1 if an individual holds a professional or managerial occupation, and 0 otherwise |
| skill | A dummy variable taking on the value 1 if an individual works as a "skilled laborer," and 0 otherwise |
| single | A dummy variable taking on the value 1 if an individual lives with a partner, and 0 otherwise |

Table A9. Regression and variable specification for the relationship between the RWM and the independent variables for the VoC-countries

| **Regression (equivalent to regression 7 in Table 7)** | |
|---|---|
| $\boldsymbol{RWM = \beta_0 + \beta_1 * Union\ density + \beta_2 * Gini + \beta_3 * Coordination\ of\ wage\ bargaining + \beta_4 * Employment\ protection + \beta_5 * LME + \beta_6 * Union\ density\ interaction + \beta_7 * Gini\ interaction + \beta_8 * Coordination\ of\ wage\ bargaining\ interaction + \beta_9 * Employment\ protection\ interaction}$ | |
| **Variable** | **Specification** |
| Union_density | The union density in a given country in a given year measured in percent (taking on values between 0 and 1) |
| Gini | The Gini coefficient in a given country in a given year measured in percent (taking on values between 0 and 1) |
| Coordination of wage bargaining | The coordination of wage bargaining index in a given country in a given year, taking on values between 1 and 5 |
| Employment protection | The employment protection index in a given country in a given year, taking on values between 0 and 6 |
| LME | A dummy variable taking on the value 1 if a country is classified as an LME, and 0 otherwise (a country is classified as a CME) |
| Union density interaction | Interaction variable capturing the effect of the LME/CME-classification and the union density |
| Gini interaction | Interaction variable capturing the effect of the LME/CME-classification and the Gini coefficient |
| Coordination of wage bargaining interaction | Interaction variable capturing the effect of the LME/CME-classification and the coordination of wage bargaining index |
| Employment protection interaction | Interaction variable capturing the effect of the LME/CME-classification and the employment protection index |

Table A10. Regression and variable specification for the relationship between the RWM and the independent variables for the full set of countries

| **Regression (equivalent to regression 7 in table 7)** | |
|---|---|
| $\boldsymbol{RWM = \beta_0 + \beta_1 * Union\ density_{it} + \beta_2 * Gini + \beta_3 * Coordination\ of\ wage\ bargaining + \beta_4 * Employment\ protection}$ | |
| **Variable** | **Specification** |
| Union_density | The union density in a given country in a given year measured in percent (taking on values between 0 and 1) |
| Gini | The Gini coefficient in a given country in a given year measured in percent (taking on values between 0 and 1) |
| Coordination of wage bargaining | The coordination of wage bargaining index in a given country in a given year. taking on values between 1 and 5 |
| Employment protection | The employment protection index in a given country in a given year. taking on values between 0 and 6 |

Table A11. Explanation of country codes

| **Abbreviation** | **Country** |
|---|---|
| **AT** | Austria |
| **AU** | Australia |
| **BE** | Belgium |
| **BR** | Brazil |
| **CA** | Canada |
| **CH** | Switzerland |
| **CZ** | Czech Republic |
| **DE** | Germany |
| **DK** | Denmark |
| **EE** | Estonia |
| **ES** | Spain |
| **FI** | Finland |
| **FR** | France |
| **HU** | Hungary |
| **IE** | Ireland |
| **IS** | Iceland |
| **LU** | Luxembourg |
| **MX** | Mexico |
| **NL** | Netherlands |
| **SK** | Slovakia |
| **UK** | United Kingdom |
| **US** | United States |