Wage-Setting Institutions and Wage Inequality in the OECD: An Examination of the Effects of Liberalization of Wage-Setting Institutions and Membership in the EU and EMU on Wage Inequality

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Abstract

Centralized wage-setting institutions are considered to be more effective at reducing wage inequality. In this paper, I offer an expansive cross-national analysis of the effects of recent liberalization in wage-setting institutions on wage inequality in the OECD, taking into special consideration the effects of EU and EMU membership. A qualitative comparison of liberalization occurring within EU, and expressly EMU, and non-EU OECD countries provides deeper insight into the institutional changes occurring across the OECD and within the EU and EMU. New data resources offer the potential to examine the fuller effects of wage-setting institutions due the inclusion of additional components, such as the use of opening clauses and other forms of derogation that add greater flexibility to collective bargaining agreements. These components are reflective of the efforts of trade unions' and firms' efforts to adjust to the pressures of global economic integration. Specifically, I examine the effects of changes in wage bargaining coverage, union concentration, centralization and coordination of wage setting, government intervention, the use of opening clauses, and EU and EMU membership on wage inequality between the years 2000-2013. The results show EU membership is associated with an increase in wage inequality at the 90/50 wage differential, while EMU membership similar effects are noticeable for both the 90/10 and 90/50 wage differentials. Wage bargaining centralization only matters in regards to the 50/10 wage differential, and the effect is in the opposite direction of what is expected. Wage bargaining coverage is inconsequential, contrary to much of the literature. The use of opening clauses during periods of crisis matters in regards to the 90/10 and 90/50 wage differentials. Importantly, government intervention and union centralization demonstrate significant importance at all wage differentials. Knowing this information will serve to facilitate policy-making and the determination of which arrangements of wage-setting institutions best serve to address wage inequality in light of increasing global pressures to liberalize.

Introduction

While the connection between wage-setting institutions and wage inequality is well examined, in the last decade and a half substantial liberalization of wage-setting institutions has occurred throughout the OECD (Visser 2015), and in particular in the European Union (EU) and European Monetary Union (EMU) (Höpner and Lutter 2014; Speckasser et al. 2015). At the same time, there has been great variation in wage inequality, with increases across many countries, relatively unchanged in some, and even declining in others (OECD 2012).[1] Liberalization is broadly considered the loosening of not only economic and labor market regulations, but also social policy (Emmenegger et al. 2012). More specifically, liberalization in wage-setting institutions can take a variety of forms, such as greater flexibility in wage bargaining agreements (Visser et al. 2014).[2] The effect of this recent liberalization of wage-setting institutions on wage inequality across all wage dispersions throughout the OECD, a more specifically the effect of EU and EU membership, has not yet been explored. Specifically, opening clauses and other forms of deviation from collective bargaining agreements have become more commonly used (Speckasser et al. 2015)[3] and wage-setting institutions in general are moving towards further decentralization (Visser 2015).[4]

[1] See Appendix 1C for graphs on changes in wage-setting institutions and wage inequality.

[2] Liberalization in wage-setting institutions is associated with decentralization in wage bargaining, declining union density (Dahl et al. 2013), decreased coordination between pivotal actors, trade unions and employers' associations, and greater flexibility in wage bargaining agreements (Visser et al. 2014). Decentralization itself can also be further understood as organized or disorganized, where the latter serves to enhance the disintegration of collective bargaining more profoundly[2] (Dahl et al. 2013; Visser et al. 2014). Hence, liberalization in wage-setting institutions is multi-faceted.

[3] Opening clauses offer firms a means to depart from collective bargaining agreements and thus they are affiliated with more decentralized wage bargaining. Most popularly associated with Germany, the use of opening clauses has become more common throughout the OECD. Originally, opening clauses consisted of working-time adjustments, though increasingly they concern wage reductions. Derogation clauses offer additional means to break away from national or sector level minimum wages. Importantly, such clauses may be most relevant where collective bargaining is not yet fully decentralized. Further, opening clauses come in a variety of forms such as generalized use

Much of the literature on wage-setting institutions either focuses on specific case studies or has been previously limited in scope by availability of data. Among the range of studies found in the literature are those on select advanced industrialized democracies (Iversen 1998; Oskarsson 2005; Wallerstein 1999), OECD countries (Afonso 2016; Calmfors and Driffell 1988; Braconier and Ruiz-Valenzuela 2014; Kahn 2000; Keoniger et al. 2004), Nordic countries (Wallerstein and Golden 1997; Vona and Zamparelli 2014), the European Union (Afonso et al. 2013; Bosch 2015; Boeri and Burda 2009; Höpner and Lutter 2014; Speckasser et al. 2015), and even comparisons between different varieties of capitalism (social market economies and liberal market economies) (Rueda and Pontusson 2000). Most commonly, studies on wage inequality focus on the 90/10 wage differential (see for example: Busemeyer and Iversen 2011; Rueda and Pontusson 2000; Wallerstein 1999). [5] Only a few earlier studies touch upon the 90/50 and 50/10 wage differentials (see for example Pontusson et al. 2002). [6] Of late, more studies have surfaced that explore the variations in the 90/50 and 50/10 wage differentials (see for example Braconier and Ruiz-Valenzuela 2015; Grimshaw et al. 2014). [7] Overall, there is agreement that wage-setting institutions do have an effect on wage inequality (Ibid.). In particular, while there is not

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or those used under more extraordinary circumstances, such as in times of crisis (Speckasser et al. 2015; also see: OECD 2010 as referenced here).

[4] Some characteristics of decentralized wage-setting include negotiations between employers and firms at the level of the firm (as opposed to sectoral agreements), fragmented and uncoordinated wage bargaining, lack of government intervention, and lack of inter- and intra-union coordination – i.e. unions that represent different pay/skill levels (Visser 2014).

[5] In general, the wage differential measures wage dispersion between earnings for full-time workers at different decile groups of the earnings distribution. For instance, the 90/10 wage differential measures the average earnings for full-time workers in the top (90^{th}) decile in proportion to average earnings for full-time workers in the bottom (10^{th}) decile (OECD Earnings Database 2016).

[6] Pontusson et al. (2002) consider the effects of partisanship and select components of labor market institutions, union density and wage bargaining centralization, on wage inequality at all wage dispersions. [Author's note: This is discussed later in more detail in the section on wage-setting institutions and wage inequality.]

[7] Braconier and Ruiz-Valenzuela (2015) focus on the macroeconomic determinants - preeminently skill-biased technological change. This is shown to have a significant, positive effect on the 90/10 and 90/50 wage dispersions (serving to increase wage inequality).

agreement on which components and combination thereof produce the optimal outcomes, two stand out as having a consistent effect on wage inequality*: wage bargaining centralization* and *wage bargaining coverage*, or inclusiveness (Visser 2013).

Earlier studies were also limited by availability of data on wage dispersion, though the collection of such data has been more rigorous of late. Hence, coverage of a greater number of years is now available on gross earnings dispersion from the OECD database. Moreover, great efforts have been made towards accumulating data on measures of wage-setting institutions. As such, Visser's (2014) Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts, 1960-2014 (ICTWSS 5.0 database) offers the most comprehensive data set to date, enhancing the possibility of more expansive cross-national comparative examinations. Furthermore, the inclusion of many new variables permits an assessment of the more intricate facets of liberalization. Some recent studies do utilize the availability of this data (for example Braconier and Ruiz-Valenzuela 2015; Speckasser et al. 2015),[8] although not in the manner set forth here in regards to wage inequality at all wage dispersions.

Recent shifts towards economic integration and the implementation of neoliberal policies across the OECD, and more specifically in the EU and EMU, solidify the significance of this

[8] For example, utilizing Viserr's (2014) database, Speckasser et al. (2015) investigate the effect of wage bargaining coordination on nominal wage growth. They find that coordination of any type and more centralized wage bargaining (level at which bargaining takes place) are associated with lower pay outcomes. Moreover, reserved use of opening clauses has limited impact. Use of crisis related opening clauses are associated with higher nominal compensation per employee, but lower nominal collectively agreed wages. Alternate means of deviations are related to lower pay outcomes. Braconier and Ruiz-Valenzuela (2015) incorporate the use of adjusted bargaining coverage in studying the effects of skill-biased technological change on wage inequality.

research. Understanding that the pressures towards liberalization[9] will likely only continue to grow, it is relevant to empirically examine the link between these institutional changes and variations in wage inequality across the OECD and whether EU and EMU membership matters. Moreover, a comparative analysis of how such facets vary between EU, EMU, and non-EU OECD countries will add greater depth to the literature. Furthermore, this study is warranted in light of new evidence that wage restraint may not even be a sufficient tool to accommodate these pressures in the EU (Stockhammer and Onaran 2012).[10]

While this study will only be able to cover the years 2000 through 2013, it is expected this research will set the stage for further comparison once new data becomes available. Additionally, as wage-setting institutions may offer a basis for implementing systems in newly democratized countries, understanding the impact of these regimes should be considered vital. Not to be forgotten, economic inequality is a well-known attribute of many countries throughout the world and labor market policies are a known contributor (Emmenegger et al. 2012). Throughout the OECD and even in the EU, the increasing divide is evident; inequality has been rising since the 1970s and presents a variety of threats such as severely restricting generational upward mobility (Ibid). Developing and establishing the best possible institutions to ensure a more egalitarian wage distribution should be of precedence due to the unavoidable necessity of global economic integration.

[9] To reiterate, liberalization in wage-setting institutions is associated with decentralization in wage bargaining, declining union density (Dahl et al. 2013), decreased coordination between pivotal actors, trade unions and employers' associations, and greater flexibility in wage bargaining agreements (Visser et al. 2014).

[10] Stockhammer and Onaran (2012) discuss that the tendency in orthodox economics is to charge inflexible labor markets with high wages and thus ensuing high unemployment levels in the Euro area. However, the authors find that unemployment has persisted regardless of falling wage shares. Hence, the authors assert wage moderation is not a useful tool to address such macroeconomic pressures. Instead, the authors propose that demand in the Euro area is wage led and call for a return to centralized wage bargaining.

The argument in this paper is that liberalization in wage-setting institutions in any form will have a negative effect on wage inequality. On the other hand, it is expected that the centralization of unions, wage bargaining coverage, and government intervention will serve to reduce wage inequality. Additionally, I argue that EU, and in particular EMU, membership will place a greater strain on wage inequality due to increasing pressures to liberalize wage-setting institutions. The results produce some expected and unexpected findings.

The results demonstrate that EU membership only matters for the 90/50 wage dispersion, while EMU membership is a significant factor for both the 90/10 and 90/50 wage dispersions, where membership is associated with an increase in wage inequality. Neither EU nor EMU membership are significant for the 50/10 wage dispersion. The positive association between wage bargaining centralization and wage inequality for the 50/10 wage dispersion seems fit somewhere into the realm of insider-outsider theories, such as labor market dualization, labor market segmentation, and labor market polarization.[11] Wage bargaining coverage, wage bargaining coordination, and wage bargaining centralization (except in the case noted just previously) do not demonstrate any association with wage inequality. Yet, government intervention[12] is linked to a significant decrease in wage inequality for all wage dispersions, as is union centralization. However, the effects of the latter two facets are much less pronounced for the 50/10 wage dispersion. Again, this signals towards a link between the insider-outsider theory

[11] As per Emmenegger et al. (2012), labor market dualization is considered to be the result of political processes that treat insiders and outsiders disparately, either serving to reinforce existing institutional dualisms or leading to the emergence of newly created institutional dualism. This acts to reinforce or reignite dualism in social policy. A feedback loop is said to occur. Labor market dualization is distinct from labor market segmentation in that segmentation indicates a demarcation between subgroups in the labor market with limited mobility between them. Labor market polarization refers to the growth in both well-paid professional occupations and low-paid service jobs, while also resulting in the disappearance of middle level, medium skill-related and clerical jobs.

[12] This hints towards the recent findings of Bosch (2015) on the instrumental role of the state in how much of an effect certain facets of wage-setting institutions have on wage inequality.

of labor market segmentation and wage inequality. The use on opening clauses during periods of crisis is associated with an increase in wage inequality for the 90/10 and 90/50 wage dispersions. This is not surprising considering that such opening clauses may generally take the form of wage adjustments. Moreover, the multi-faceted nature of wage-setting institutions may be further differentiated in the effects such regimes have on different wage dispersions. Understanding this multi-faceted nature of decentralization in wage-setting institutions, it is imperative to look at which facets have been previously associated with wage inequality, how these facets facilitate wage bargaining in a variety of manners, and what the implications may be as wage-setting institutions succumb to the pressures to liberalize.

This paper is organized as follows: First, I discuss the literature up to date on the study of wage-setting institutions. Then, I discuss the pressure to liberalize such institutions in the OECD and how such pressure is unique to the EU and EMU. Following this, I put forth my hypotheses and expectations. Next, I reveal the variables, measurements, and method of analysis. I then present and discuss the data and results in relation to previous literature and expectations. I follow this with some concluding remarks and touch upon some future research directions.

Wage-Setting Institutions and Wage Inequality

Background

Rising wage inequality in the 1980s initially led to studies that either took a labor economics approach, focusing solely on labor supply and demand factors such as the female participation rate and skill-biased technological change (Rueda and Pontusson 2000), or focused on the effects

of unionization (Card et al. 2003; Wallerstein 1999). [13] For instance, Kahn (2000) finds a positive relationship between unionization levels and wage inequality across 15 OECD countries between 1985-1994 and further adds the dually positive effect unionization has on unemployment levels.[14] The focus on this single component of wage-setting institutions, unionization levels, on wage inequality continued throughout the mid to late-1990s, with the level of unionization consistently demonstrating a direct and negative relationship with changes in wage inequality (Wallerstein 1999; Kahn 2000).

At the other end of the spectrum, in the early to late 1980s the main focus for studies on wage bargaining centralization were its effects on macroeconomic performance, such as unemployment levels (Calmfors and Driffill 1988; Calmfors 1993; Roberts 1997)[15] and economic growth (Eichengreen and Iversen 1999). During this period of time the most influential ideas and empirical studies supported the idea that centralized wage-setting institutions in combination with flexible, Keynesian-style macroeconomic policies would best serve to produce optimal macroeconomic conditions, with the goal of full employment at the forefront (Iversen 1998). On the other hand, the alternate theory at the time proposed that optimal macroeconomic conditions would be best achieved via more restrictive macroeconomic policies (i.e. low inflation) in conjunctions with greater flexibility in labor market institutions (Ibid.). Furthermore,

[13] For instance, in comparing the U.S., U.K., and Canada, Card et al. (2003) find that unionization reduces wage inequality among men, but not women. Variation between the three countries demonstrates that unionization can explain cross-national variation in wage inequality.

[14] According to Kahn (2000) higher levels of unionization serve to increase relative pay, while also leading to lower relative employment.

[15] Calmfors and Driffill (1988) find that either highly centralized wage bargaining systems at the national level or highly decentralized systems at the local level perform best in regards to reducing unemployment. Middle levels of centralization are shown to have the worst outcome on unemployment levels. Roberts (1997) finds that both highly centralized bargaining and decentralized systems can be Pareto-optimal. However, fully decentralized systems have a more beneficial impact on macroeconomic performance.

centralization came to be seen as an impediment to economic growth (Eichengreen and Iversen 1999).

Expanding upon the literature on unionization and the macroeconomic effects of wage bargaining centralization, researchers began to investigate the effect of wage-setting institutions on wage inequality (Rueda and Pontusson 2000; Wallerstein 1999). This field of research studies the many components of wage-setting institutions, such as the level at which collective bargaining takes place, the coordination of bargaining among employers and unions, the level of government intervention in wage bargaining, the reach of collective bargaining coverage, and union concentration. To be sure, unionization is still a vital contributor to the studies of wage-setting institutions and wage inequality today, as are the components common to labor economics studies on wage inequality (Afonso et al. 2013). Moreover, the relevance of wage-setting institutions in relation to macroeconomic conditions is still prevalent throughout the literature (Afonso 2016; Speckasser et al. 2015) and vital to understanding efforts towards liberalization of wage-setting institutions in the EU, and more specifically the EMU (Höpner and Lutter 2014; Speckasser et al. 2015). In order to review the literature further in these regards and develop an argument, an understanding of the components of wage-setting institutions in relation to wage inequality is fundamental.

Wage-setting Institutions & Wage Inequality Measures

Wage inequality is measured by utilizing the 90/10, 90/50, and 50/10 decile ratios of gross earnings (OECD Earnings Database 2016). Studies demonstrate the value in using these indices to measure wage inequality and they are commonly used throughout the literature (Antonzyck et al. 2010; Braconier and Ruiz-Valenzuela 2014; Busemeyer and Iversen 2011; Oskarsson 2005; Rueda and Pontusson 2000; Wallerstein 2000). On the other hand, the gini coefficient is another

well-established measure of income inequality for which multiple sources exist. However, it is commonly known that the gini coefficient is more responsive to middle-income inequalities (De Maio 2007), while also exhibiting greater measurement error at the extreme ends of the income distribution (Wallerstein 2000). In this sense, the gini measurement may not offer the most accurate results in the case of wage inequality. Additionally, even the most comprehensive and well-developed inequality data sets, such as those by the OECD and the Luxembourg Income Study (LIS) present gaps in data records that are often difficult to reconcile when selecting cases. This is especially so when attempting to put forth a comprehensive cross-national comparison over time. For the purposes of this study the more generally accepted measure of wage dispersion is utilized. A foremost matter to keep in mind, as the gross wage dispersions exclude part-time and temporary workers, the results will tend to underestimate the effects of the independent variables on wage inequality (Pontusson et al. 2002).

Consistent throughout the literature, *wage bargaining centralization*[16] (not to be confused with centralization of unions, but comparable in some respects to coordination and type of bargaining) refers to the level at which collective bargaining takes place (Camfors and Driffill 1988; Kenworthy 2001; Pontusson et al. 2002; Wallerstein 1999). Centralization of wage setting is commonly thought to reduce wage differentials between both firms and sectors as wage agreements become more unified (Pontusson et al. 2002). While centralization also may serve to compress wages by increasing the bargaining power of unions, this may be dependent upon the joint nature of the bargaining; where joint bargaining by low-wage and high-wage unions serves to override market forces more readily than disjointed bargaining (Pontusson et al. 2002;

[16] In regards to wage-setting institutions, the independent variables are described further in Appendix 1A. Details of any composite measures are also specified in the appendix.

Wallerstein 1999). The indicator utilized in this paper is more complex and highly developed than the original measure it is based upon, which only looks at the prevailing level at which bargaining takes place (ranging from local or company level bargaining to central or cross-industry bargaining). The new measure is a compilation based on the previous measure, plus an additional set of factors that attempt to delineate a more precise account of bargaining over wages and working hours. The new variables measure "the frequency and scope of additional enterprise bargaining in the market sector within the framework of sectoral or cross-sectoral agreements; the articulation of multi-level bargaining; the legal or contractual basis for derogation; general opening clauses in in sectoral agreements, and crisis-related hardship clauses in agreements of any type" (Visser 2014: 5). Calmfors and Drifill (1988) demonstrate that wage bargaining centralization, or the level at which bargaining takes place, exhibits a non-linear relationship with real wages, which then results in changes in labor demand. This relationship has been confirmed throughout the literature (Drifill 2006) and contested (Caju et al. 2008; Speckasser et al. 2015). Hence, while wage bargaining centralization is commonly considered to be a determinant of wage inequality, some variation exists in the literature on how this mechanism works.

Wage bargaining coordination refers to the degree to which wage setting is coordinated between actors (i.e. employers' associations, industries, firms, unions, and government) and wage bargaining levels throughout an economy, where the external economic implications are taken into great consideration by the actors involved (Caju et al. 2008). In other words, coordination refers to the how harmonized wage policies are between different players at all levels of wage bargaining, or the degree to which less influential players follow in line with more influential ones (Visser 2013; see also, as referenced here, Soskice 1990; Traxler and Brandl

2012; Kenworthy 2001). To be clear, coordination is also determined by union concentration and the reach of employers' associations (Visser 2013). This measures the degree of coordination by accounting for the centralization of wage setting, the formality of centralization, the synchronization of such arrangements, and the regularity and extensiveness of such, with without the engagement of the government, and considering all patterns of association (Visser 2015). For instance, horizontal coordination means that actors within the same level of bargaining are synchronized, while vertical coordination means that coordination is across bargaining levels for the purpose of achieving common macroeconomic goals (Caju et al. 2008). Importantly, it is not clear whether coordination is preferable regarding macroeconomic outcomes (Caju et al. 2008). However, some evidence shows that coordination at any level tends to offer moderation in wage increases, while uncoordinated wage-setting serves to result in higher pay outcomes when looking at the *type of coordination* (Speckesser et al. 2015). Also relevant to consider it that coordination may or may not have non-linear relationship (Driffill 2006). In Driffill's study (2006) coordination is a combined measure of employer coordination and union coordination, and neither coordination nor its square measure exhibit a significant relationship with unemployment levels and the non-linear relationship theory does not hold except for under a population weighted least squares analysis. It is asserted that high levels of centralization are closely comparable to high levels of coordination (see Soskice 1990, as referenced by Visser 2013). Yet, these two can be combined in a variety of manners, such low levels of coordination with high levels of centralization (Visser 2013).

As per Visser (2014), *government intervention* is based on a combination of sources (see Hassel 2006; Golden and Lange 1996; Golden, Lange, and Wallerstein 2006 as referenced here) with some modifications based on these previous measures and the addition of original updates.

The modifications permit discernment between cases of non-intervention, where either government offers strong backing of sectoral unions and agreements, or alternatively where the government largely backs fragmented and local bargaining (Visser 2014). A recent study by Bosch (2015) emphasizes the instrumental role of government intervention in enhancing the effectiveness of statutory minimum wages and collective bargaining on minimizing income inequality. Similarly, Visser (2015) asserts that government policies play a central role in backing the inclusiveness of wage-setting institutions[17]. *Minimum wage setting* is considered a central means of government intervention (Visser 2014). As such this is included in the analysis. Minimum wage setting measures whether a national, statutory minimum wage exists, none at all, or some other level of binding or extension of a national minimum wage (Ibid.).

Union centralization (concentration) measures how coordinated wage-setting efforts are between workers in distinct firms or distinct industries (Wallerstein 1999). This composite variable measures the concentration of trade unions, intra- and inter-organizational cohesiveness, and the extension of authority of both union confederations over affiliates and affiliates over their members (Visser 2014). The methodology is based on Iverson's work (1999) (as referenced in Visser 2014). In comparing nations, higher levels of union concentration have shown to have a stronger ability to reduce wage inequality than collective bargaining coverage (Rueda and Pontusson 2000; Wallerstein 1999). However, as noted above, how unified the front is between low-wage and high-wage unions may be of special importance in the ability of union centralization to have an effect on wage inequality (Pontusson et al. 2002; Wallerstein 1999).

[17] For example, government policies can provide the legal groundwork by which both unions and employers are equally recognized, while also encouraging collective bargaining and ensuring it remains intact (Visser 2015).

Wage bargaining coverage provides a measure of the number of employees covered by wage bargaining agreements in proportion to the total number of wage and salary earners with the right to bargaining (Wallerstein 1999). While union density is commonly used throughout the literature, the similarity between this measure and collective bargaining coverage is not consistent between countries across the OECD (Wallerstein 1999). For instance, as indicated by the data, union density declined moderately since 1999 in Australia, Austria, and Denmark, yet coverage remains fairly stable (Visser 2015). A more substantial decline in union density is seen in the Czech Republic (OECD 2016), but coverage remains more or less stable here as well (Visser 2015). On the other hand, union density and coverage have both remained more or less the same in Canada and Belgium (OECD 2016). Furthermore, government extensions in European countries often result in a higher number of wage and salary earners covered (Wallerstein 1999). To be sure, there is still substantial variation in coverage between countries, thus offering a useful measure. While unadjusted bargaining coverage, which measures the number of employees covered as a proportion of all wage and salary earners in the workforce, might offer greater insight the data is too limited to be useful for this study (Visser 2015). The downside of utilizing the adjusted bargaining coverage measure is that the data is also somewhat limited in availability, though not to the extent on unadjusted bargaining coverage and not enough to limit the number of observations too greatly (Ibid.).

Flexibility in Labor Market Institutions

Decentralization and liberalization of wage-setting institutions can take a variety of forms. Not only does this include the initially (and continued to date) examined effects of declining unionization levels, but also fragmentation and localization of wage bargaining, shifts in

coordination and government intervention, changing union influence in general, and the utilization of new tools to add greater flexibility in collective bargaining agreements.

Initially, the shift did not appear to be moving towards greater decentralization in the EU. In Northern and Central Eastern Europe between 1950-1992, where corporatist systems are known to have institutionalized collective bargaining, powerful and far-reaching unions, and highly centralized bargaining, wage-setting institutions appeared to withstand emerging global pressures (Wallerstein et al. 1997).[18] Only a unique case emerged in this region during this period from the Nordic countries; specifically, decentralization in Sweden undermined the bargaining position of unions (Wallerstein and Golden 1997). However, many still expected that global pressures such as technological developments and economic integration would lead to decentralization of corporatist regimes (Wallerstein et al. 1997). In fact, as reiterated by Iverson (1998), Katzentein, Krasner, and others at the time emphasized the importance of readjustments and flexibility in light of increasing international exposure, requiring strategic institutional change. These approaches are both utilized throughout what are considered to be coordinated market economies (CMEs) (Iversen 1998).[19] While many scholars asserted that the corporatist model was no longer able to withstand the pressures of globalization, and thus no longer a viable alternative to the liberal model, it may be more that the corporatist model had merely undergone

[18] Wallerstein et al. (1997) examine the following components of wage-setting institutions across eight corporatist countries (Austria, Belgium, Denmark, Finland, Germany, the Netherlands, Norway, and Sweden): union density, union coverage, union concentration, statutory authority of unions confederations and affiliates, statutory authority of employers' confederations, and centralization (measured by government and confederal involvement in wage setting. Across the time period covered while some decentralization is apparent, in the more recent years any observable changes were not uniform and overall strength of such institutions was apparent.

[19] Iversen (1998) follows in line with Soskice's classification of CMEs. In the OECD this includes Austria, Belgium, Denmark, Finland, Germany, Japan, Netherlands, Norway, Sweden, and Switzerland. In Hall & Soskice (2001) the remaining classifications are: liberal market economies - Australia, Canada, Ireland, New Zealand, UK, and US; coordinated market economies – see previous and Iceland; the remainder (France, Greece, Italy, Portugal, Spain) are somewhat obscure.

changes that have led to less egalitarian outcomes (Baccaro 2014). Baccaro (2014) attributes this to the changing relationship between unions and governments, with increasing emphasis on utilizing democratic processes to legitimize their positions.

In general, a larger set of countries began to move towards greater decentralization in wage-setting beginning in the 1990s (Visser 2015). To be clear though, in countries outside of the EU and EMU, such as the United States, United Kingdom and Japan the lineage of decentralization can be traced much further back (Ibid.). Most recently, liberalization has been exacerbated by the 2008 economic crisis (Ibid.). Following the institution of the euro, studies came to examine the relationship between changes in collective bargaining in the EMU and the shift towards a European Central Bank (Sosckice and Iversen 2001). At first, despite decreasing unionization levels (and thus union coverage) in many countries, collective bargaining coverage in the EMU remained high overall (Soskice and Iversen 2001). However, since the institutionalization of the euro in 1999, the EU has placed an increasing emphasis on members' adaptation of wage-setting institutions to macroeconomic pressures, such as reducing unemployment and maintaining high levels of economic growth, to ensure macroeconomic stability within the EMU (Speckesser et al. 2015). These changes are taking place in a rapidly evolving environment characterized by increasing competition (Speckasser et al. 2015) and have only increased following the 2008 economic crisis (Visser et al. 2015).

The increasing prevalence of wage bargaining coordination within member states in the 1980s prompted scholars to theorize that the formation of the EMU would lead to greater competition for labor markets and assert the necessity of retaining a competitive edge in order to reach optimal macroeconomic conditions, such as full employment (Speckasser et al. 2015; Visser et al. 2015). In later years, the effect of EU integration, and particularly the EMU, came

under even greater scrutiny (Visser 2005). Although these institutions were praised for their resilience and ability to adapt to the changing economic climate and integration, adaptation is often plagued by the use of opening clauses, which serve to undermine collective rights (Ibid.).

For example, due to the more extreme liberalization in wage-setting institutions in Germany, many researchers examine the effect of wage bargaining decentralization and wage bargaining coverage, which includes components such as opening clauses, moves towards greater labor market flexibility, and the institution of active labor market policies on wage inequality (Antoncyzk et al. 2010; Dustman et al. 2014). A decline in collective wage bargaining (Antonczyk et al. 2010), and more specifically changes at the level of the firm due to external and internal economic pressures has led to shifts in wage policies that have contributed towards increasing wage inequality in Germany (Antoncyzk et al. 2010; Dustman et al. 2014). In the German case, shifts towards liberalization in wage policies have been exhibited by the inclusion of opening or hardship clauses in collective bargaining agreements (Boni 2009; Brandle and Heinbach 2013; Dustman et al. 2014). The use of opening clauses is associated with a negative relationship with wage levels (Heinbach 2007). In France and Italy, other methods of decentralization in collective bargaining have taken place, in various forms that offer greater flexibility in and deregulation of the labor market (Boni 2009). On the same note, in the Nordic cases centralized wage setting is shown to offset the effects of active labor market policies (Vona and Zamparelli 2014). [20]

[20] Active labor market policies are those based on a direct approach towards countering labor market challenges, such as unemployment and skill-based inconsistencies, while evading inflation (macroeconomic) based approaches. In later studies, active labor market policies are reported to include (Berry 2014; Calmfor and Lang 1995). Active labor market policies were also relevant in the German case (Dustmann et al. 2014).

Pressures to liberalize labor market institutions are also evident outside of the EU and alternatively within the EU, but outside the EMU. Countries such as the United States, the United Kingdom, and Japan have been associated with decentralized wage bargaining for some time (Speckasser et al. 2015). In Japan, neoliberal institutional change developed amidst similar exogenous pressures, although the process by which this occurred came from policy entrepreneurs from within (Watanabe 2015). In Norway, where the wage-setting regime is considered highly centralized, increased flexibility emerged earlier in the local public sector in 1990, which has been empirically linked to increases in the wage dispersion in this sector (Falch and Strøm 2002). In Denmark, decentralized wage bargaining is shown to be a favorable environment for skilled laborers, while also leading to greater wage dispersion (Dahl et al. 2013).

While it is clear that there is pressure across the OECD, and not only within the EU and EMU, to liberalize wage-setting regimes, the disparate consequences of such liberalization on the various wage dispersions has not yet been surveyed across OECD countries and taking into account the effects of EU and EMU membership. For instance, evidence shows that price indexes and labor productivity are influential on collective bargaining agreements across European nations, but also in regards to wage setting in Japan and the United States (Caju et al. 2008). However, efforts to accommodate certain macroeconomic outcomes within the EU may not be so easily achieved. More specifically, currency unions such as the EMU have fixed exchange rates, which are considered a double-edged sword (Höpner and Lutter 2014). While fixed exchange rates offer certainty, they also eliminate the ability to utilize a vital macroeconomic policy tool – manipulation of nominal exchange rates (Ibid.). This places greater emphasis on the ability to harmonize price inflation instead, which is closely linked to nominal unit labor costs (NULC) (Ibid.). These costs are indicative of wage-related competiveness and

thus it is expected to keep wages from outpacing labor productivity (and NULC from increasing) (Speckesser et al. 2015). Yet, harmonizing price inflation requires the ability to harmonize nominal labor unit costs, which proves more challenging since such costs are in part determined by the particularities of wage-setting institutions (Höpner and Lutter 2014). In fact, Soskice and Iversen (1998) foresaw that the demands of adapting to European inflation targets set by the European Central Bank, as opposed to national ones, would delimit the ability of EMU members to utilize the vital tool of wage restraint in a similar manner, necessitating a shift towards negotiated social contracts as a means to accommodate. However, it is not even clear that wage moderation is sufficient to address macroeconomic problems such as unemployment in the EMU (Stockhammer 2007).

Given the evidence in the previous discussion, I present seven hypotheses. In general, I argue that liberalization of wage-setting institutions will be associated with increases in wage inequality across all wage dispersions. I expect that EU and EU membership will also be associated with greater wage inequality across all wage dispersions.

H1: As the centralization of wage bargaining decreases, wage inequality will increase across all wage differentials.

H2: As coordination of wage bargaining decreases, wage inequality will increase across all wage differentials.

H3: As government intervention increases, wage inequality will decrease across all wage differentials.

H4: As union centralization increases, wage inequality will decrease across all wage differentials.

H5: As wage bargaining coverage increases, wage inequality will decrease across all wage differentials.

H6: The use of crisis-related opening clauses increases will be associated with an increase in wage inequality across all wage differentials.

H7: EU and EMU membership will be associated with an increase in wage inequality across all wage differentials.

Statistical Procedures

Data

For the dependent variable, wage inequality, I utilize the 90/10, 90/50, and 50/10 decile ratios of gross earnings (OECD Earnings Database 2016). The base numbers refer to the average earnings for full-time workers in the top, median, and bottom (90^{th}, 50^{th}, and 10^{th} respectively) deciles of the earnings distribution. The ratios measure the average wage in the respective deciles relative to the other deciles average wage. These measures are in logarithmic form to correct for error terms that do not meet to standard of a normal distribution (Wallerstein 1999). Hence, the variables can range from negative infinity (where the average wages from the respective deciles are equal) to positive infinity; the results are not sensitive to this transformation (Ibid.).

The central independent variables under consideration as representative of wage-setting institutions are the *centralization (level) of wage bargaining, wage bargaining coordination, government intervention, minimum wage setting*, and *wage bargaining coverage*. Measurements for all of these variables are obtained from Visser's (2015) "Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 51 countries between 1960 and 2014" (ICTWSS 5.0). This database is a compilation that is founded on well-established and reliable data resources, including but not limited to the OECD, European Industrial Relations Online (EIRO), and the International Labor Organization (ILO) (Visser

2015). This exhaustive database offers the best possible data availability covering the most extensive number of years and countries as required for this examination. Furthermore, each measure is founded on previous research and data resources that are preeminent throughout the literature.

Importantly, I include two dummy variables for EU and EMU membership. For both of these variables, 1 denotes that the country is a member in the EU or EMU and 0 denotes non-membership, respectively. In light of the evidence put forth in the qualitative analysis, inclusion of these two dummy variables may offer insight into the variation in wage inequality between OECD members. The variables do not exhibit collinearity (~.40) to the extent the results would be disadvantaged.

The indicator for *wage bargaining centralization* is a composite measure that ranges from 1 to 5, where 5 indicates the highest level of centralization in wage bargaining. The indicator *wage bargaining coordination* measure ranges from 1 to 5, where 1 denotes highly fragmented bargaining, largely at the plant or firm level, and 5 denotes highly coordinated bargaining in a variety of combinations. The indicator for *government intervention* runs from 1 to 5, where 5 denotes high government involvement in wage bargaining in the form of direct control over outcomes (Visser 2014). The indicator for *minimum wage setting* runs from 0 to 8, where 0 denotes no statutory minimum wage, whether at the national or sectoral level, and 8 denotes a government imposed statutory minimum wage (Ibid.). The indicator for *wage bargaining coverage* is measured from 0 to 100, where 100 indicates a higher level of collective bargaining coverage. This variable is utilized in log form in order to normalize the distribution. The indicator for *union centralization* runs from 0 to 1, where 1 indicates greater union centralization

(Ibid.). Details for each variable, including the components of composite measures, are given in Appendix 1A.

I also include a number of control variables in order to ensure the validity of the results. This includes the following variables: *trade openness, employment protection legislation, left government,* and *tax wedges*. Particular variables such as trade openness and government ideology (Boeri 2012; Oskarsson 2005; Pontusson et al. 2002; Wallerstein 1999) are present throughout previous literature. A variable for left government, which has previously been shown to have a dampening effect on wage inequality (Pontusson et al. 2002), is utilized to control for government ideology. Trade openness is measured as the sum of exports plus imports as a proportion of total GDP (OECD 2016). This variable is measured on a scale of 0 to 100, where 100 indicates greater trade openness. The variable is utilized in log form in order to minimize the effect of a skewed distribution.

In the EU, research shows that skill-biased technological change, education, and immigration put upward pressure on wage inequality when comparing wages of individuals with secondary and tertiary educational attainment (Afonso et al. 2013). More recent studies on the OECD provide empirical evidence that the effect of skill-biased technological change on wage inequality is tempered by education levels, while weaker wage-setting institutions and structural policies both place stress on wage inequality (Braconier and Ruiz-Valenzuela 2014). However, skill-biased technological change data is not readily available and requires complex mathematical procedures beyond the scope of this paper. Data on education levels, such as tertiary educational attainment, is rather limited in availability (OECD 2016). Inclusion of this variable would limit the number observations to a great extent and is thus omitted. Regarding structural policies, *employment protection legislation* is shown to have a negative relationship

with the male wage inequality in particular (Keoniger et al. 2007). This variable is measured on a scale of 0 to 6, where higher numbers indicate more restrictive legislation in regards to employee dismissals (CPDS 2015). Further, the weakening of employment protection in recent years is shown to put further strain on wage inequality, where the effects employment protection legislation are significant specifically in regards to the 90/10 and 50/10 wage dispersions (Braconier and Ruiz-Valenzuela 2014). Higher tax wedges serve to increase employers' labor costs and decrease gross earnings, thus limiting the number of low wage employees and lowering wage differentials (Braconier and Ruiz-Valenzuela 2014). The variable for tax wedges is measured as the taxes paid by single, employed individuals with no children in proportion to the employers' total labor costs (OECD 2016). This serves to measure how much downward pressure labor income taxes place on employment (Ibid.). This variable is measured on a scale of 0 to 100, where movement towards 100 indicates a higher tax wedge.

Methods

In this study I perform a series of regressions utilizing cross-sectional panel data, with the number of observations per country ranging from 1 to 14. A listing of the countries included can be found in Appendix 1B. The unit of observation is country-years of the dependent and independent variables. This type of analysis permits insight into variation both between and within countries (Pontusson et al. 2002). The inclusion of dummy variables for EU and EMU membership accounts for country-group specific effects that are not controlled for in the analyses (Green and Livanos 2015), similar to the benefits of utilizing a fixed-effects model. Since these are both dummy variables, the regressions are performed with random effects, with added tests for robustness to account for serial autocorrelation.

Results and Discussion

The results clearly demonstrate that the centralization of wage bargaining (again, which is mitigated by factors such as the level at which bargaining takes place, the use of general opening clauses, the frequency and scope of additional bargaining, formalization of such bargaining, the level of possible derogation of agreements) has a positive and highly significant effect on wage inequality for the 50/10 wage dispersion. This is the opposite of what was expected in hypothesis 1, as increases in the centralization of wage bargaining is associated with an increase in wage inequality. Since the possibility of a non-linear relationship between the level of bargaining and macroeconomic factors is noted throughout the literature, the regressions were also run with the centralized wage bargaining variable squared. The results only demonstrated minor differences that do not distort interpretations made here and will be included in the final paper with added discussion.

Coordination of wage setting demonstrates that the level of coordination or fragmentation of wage setting does not have a significant effect on wage inequality for any of the wage dispersions. This is not altogether surprising considering the lack of consensus on this factor's effects. Government intervention, where higher numbers signify increased intervention in wage bargaining, signals towards a strong, negative and significant effect for the 90/10, 90/50, and 50/10 wage dispersions, which serves to minimize wage inequalities. Government intervention has a moderate, negative and significant effect on the 50/10 wage dispersion. Union centralization demonstrates the most powerful relationship and is significant for all wage dispersions, where it serves to reduce wage inequality most for the 90/50 wage dispersion. Across the board, minimum wage setting and the number of left government seats do not demonstrate any relationship with changes in wage inequality. Remarkably, adjusted union

coverage appears only to be influential on the 50/10 wage dispersion, where it has a moderate and significant effect serving to reduce wage inequality.

Taking into consideration the overall results regarding wage-setting institutions leads to an unexpected conclusion. According to the insider-outsider theory of labor market dualization, outsiders are those in the workforce that depart from norm of the "industrial blueprint of protected, stable, full-time, and fully insured insider employment" (Häusermann and Scwander 2012: 28). The percentage of outsiders is on the rise and the repercussion of belonging to said classification include several drawbacks, such as financial hardship, bleak job prospects, among other problems (Häusermann and Scwander 2012). In fact, the effect of welfare state systems on labor market segmentation is more complicated; welfare states may also serve to enhance or strengthen labor market segmentation (Ibid.). Decentralization of wage bargaining is also linked to labor market stratification between insiders and outsiders, which leads to more conservative training implementation (Busemeyer and Iverson 2011). Hence, it may be useful in the future to investigate preemptively from this perspective.

Tax wedges demonstrate a significant relationship with all wage dispersions, where higher tax wedges serve to reduce wage inequality. This is consistent with previous findings in the literature. Since tax wedges have an impact on labor costs for employers (see previous references), it is possible that there is a focus on retaining high skilled employees. This will be

Table 1: Wage-setting Institutions and Wage Inequality in the OECD (2000-2013)

	ln(D9/D1)	ln(D9/D5)	ln(D5/D1)
Centralization of Wage Bargaining	-0.001 (-0.001)	0.004 (-0.011)	0.013*** (-0.005)
Opening Clauses during Crisis	0.040*** (-0.015)	0.055** (-0.027)	0.017 (-0.012)
Coordination	0.014 (-0.011)	0.010 (-0.012)	-0.008 (-0.007)
Government Intervention	-0.024*** (-0.008)	-0.035*** (-0.008)	-0.010* (-0.005)
Union Centralization	-0.747** (-0.319)	-0.897*** (0.053)	-0.296** (-0.115)
Minimum Wage Setting	0.001 (-0.002)	----	-0.001 (-0.002)
lnAdjusted Coverage	0.055 (-0.046)	-0.035 (-0.069)	-0.064** (-0.032)
lnTaxWedge	-0.121** (-0.052)	-0.206** (-0.087)	-0.095** (-0.047)
Employment Protection Leg	0.014 (-0.025)	-0.054 (0.006)	0.040 (-0.039)
lnTrade	-0.012 (-0.052)	0.006 (-0.047)	0.054** (-0.021)
Left Government Seats	----	----	----
EU member	-0.001 (-0.009)	0.033* (-0.020)	0.021 (-0.013)
EMU member	0.037** (-0.015)	0.037** (-0.019)	0.007 (-0.009)
Number of Observations	133	145	145
Number of Countries	24	25	25
R-Squared	0.41	0.47	0.39

Note: Point estimates from random-effects, robust cross-sectional time-series regression. The standard errors (in parenthesis) are adjusted for clusters. Countries included and time coverage are detailed in the appendix. Variable descriptions and sources are also detailed in the appendix. *,**,*** denote significance at the .10, .05, and .01 level, respectively.

examined further in the future when discussing insider/outsider theories regarding collective bargaining negotiations. Employment protection legislation demonstrates a positive, but insignificant effect on wage inequality. It is important to note that one particular factor that demonstrates no effect on the 90/10 and 90/50 wage dispersions, which is trade, is significant for the 50/10 wage dispersion. This may also feed into the insider-outsider theories, in that trade as a macroeconomic factor may be connected to increasing pressure to liberalize wage-setting institutions.

Importantly, it is relevant to discuss the effects of being a member of the EU and EMU. For the 90/50 and 90/10 wage dispersions, EMU membership has a significant and positive effect, serving to increase the level of wage inequality. Yet, EU membership is only significant for the 90/50 wage dispersion. These results preempt thoughtful consideration into why membership in the EU and EU has varying effects on the wage dispersions. It might be hypothesized that for the 50/10 wage differential it matters not where this inequality is occurring and only that institutions are becoming more inclusive. Regardless, this should not be taken lightly. Why is it that wage bargaining centralization and trade openness would overall serve to increase wage inequality for the 50/10 wage dispersion, while EMU membership would affect the 90/10 and 90/50 wage dispersion? This may point towards insider-outsider theories of the labor market. Additionally, pressures to harmonize policies throughout the EU, and especially the EMU should also be examined further. The differences between the effects of the factors explored here on the different wage dispersions warrant much further investigation and discussion. Many intricacies could explain these differences, especially those that differ between EU, EMU, and OECD members. This will be developed in a later study.

Conclusion

In conclusion, the results show that wage bargaining centralization only matters in regards to the 50/10 wage differential, and the effect is in the opposite direction of what is expected. Wage bargaining coverage is inconsequential, contrary to findings in much of the literature. The use of opening clauses during periods of crisis matters in regards to the 90/10 and 90/50 wage differentials. Importantly, government intervention and union centralization demonstrate significant importance at all wage differentials. Knowing this information will serve to facilitate policy-making and the determination of which arrangements of wage-setting institutions best serve to address wage inequality in light of increasing global pressures to liberalize.

The impact of EU and EMU membership on wage inequality is varied by wage dispersion. Additional evidence shows that in the EU, and specifically the EMU, that aggregate demand is wage-led and greater flexibility in wage-setting institutions has not effectively addressed macroeconomic concerns; hence, a return to coordinated bargaining and wages that keep up with productivity is in order (Stockhammer and Onaran 2012). Bosch (2015) proposes that while collective bargaining is more influential on combating wage inequality, statutory minimum wages retain importance; overall though, the relevance of government intervention is key to precluding further degradation of wage-setting institutions. However, as the results in this study indicate, a return to greater centralization of wage bargaining may be most relevant to the wage dispersion between workers in the lowest earnings deciles, where it would not have the desired effect should the aim be to reduce wage inequality.

It would serve this study to include additional variables in the future to further test the robustness of the results. For one, as discussed earlier skill-biased technological change is prominent throughout the literature. However, as the study by Braconier and Ruiz-Valenzuela

(2014) demonstrates skill-biased technological change is notoriously difficult to measure and require methods beyond the scope of this study. Similarly, a measure of education (i.e. tertiary) should be included as a measure in the future. GDP per capita may also be instrumental in minimizing wage inequality. For instance, Bigsten and Munshi (2014) find that the positive relationship between trade and financial openness and wage inequality is mitigated by GDP per capita, such that the effects are less felt in countries where GDP per capita is high. However, this relationship may only be a mitigating one, as other research finds that the relationship between GDP per capita and wage inequality for all measures of wage dispersion while negative is not significant (Braconier and Ruiz-Valenzuela 2014). Furthermore, some evidence shows that unions may even prefer the decentralization of wage setting when pressures of outsourcing are great enough (Gaston 2002). This relationship should be explored further in regards to the decentralization of wage-setting institutions and outcomes of such.

Appendix 1A: Wage Setting Measures

Source: ICTWSS 5.0 Codebook

Coordination of Wage-setting:

5 = maximum or minimum wage rates/increases based on
   a) centralized bargaining by peak association(s), with or without government involvement, and/or government imposition of wage schedule/freeze, with peace obligation
   b) informal centralization of industry-level bargaining by a powerful and monopolistic union confederation
   c) extensive, regularized pattern setting and highly synchronized bargaining coupled with coordination of bargaining by influential large firms

4 = wage norms or guidelines (recommendations) based on
   a) centralized bargaining by peak associations with or without government involvement
   b) informal centralization of industry-level bargaining by a powerful and monopolistic union confederation
   c) extensive, regularized pattern setting coupled with a high degree of union concentration

3 = negotiation guidelines based on
   a) centralized bargaining by peak associations with or without government involvement
   b) informal centralization of industry-level bargaining
   c) government arbitration or intervention

2 = mixed industry and firm-level bargaining and relatively weak elements of government coordination through the setting of minimum wage or wage indexation

1 = fragmented wage bargaining, confined largely to individual firms or plants

Centralization of Wage Bargaining: Actual level at which bargaining takes place

LEVEL - (fAEB+OCG)/4(=max value) + (Art+DR-1)/5(=max value)

Level: The *predominant* level at which wage bargaining takes place

5 = bargaining predominantly takes place at central or cross-industry level and there are centrally determined binding norms or ceilings to be respected by agreements negotiated at lower levels;

4 = intermediate or alternating between central and industry bargaining;

3 = bargaining predominantly takes place at the sector or industry level;

2 = intermediate or alternating between sector and company bargaining;

1 = bargaining predominantly takes place at the local or company level

[Note: A level is 'predominant' if it accounts a minimum of two-thirds of the total bargaining coverage rate in a given year and country. If it accounts for between one-third and two-thirds of the coverage rate, we have a mixed or intermediate situation, between two levels. This also occurs when bargaining levels rotate and/or it is not feasible to estimate which of the two contributes more to actual regulation of employment relations.]

fAEB: Frequency or scope of additional enterprise bargaining

3 = additional enterprise bargaining on wages is common

2 = additional enterprise bargaining on wages occurs only in large firms

1 = additional enterprise bargaining on wages is rare even in large firms.

0 = no additional enterprise-level bargaining on wages (or does not apply, if 'level'=1)

Art: Articulation of enterprise bargaining
3 = disarticulated bargaining: additional enterprise bargaining on wages when it happens is informal and suppressed or restricted by law or sectoral agreement
2 = articulated bargaining: additional enterprise bargaining on wages is recognized and takes place under control of union (same signatory as sector agreement)
1= disarticulated bargaining; additional enterprise bargaining on wages when it happens is, formally or infor- mally, also conducted by non-union bodies (not under union control)
0 = does not apply (level = 1)

DR: Derogation
3 = favourability is anchored in law and strictly applied, no derogation
2 = favourability principle is anchored in law, derogation possible under conditions
1 = relationship between agreements is matter for contracting parties (not defined in law)
0 = favourability is inversed, enterprise agreements favoured over higher-order agreements.

[Note: Derogation refers to deviation from norms as established in higher-order (generally sector level) agreements. Usually this is accompanied by a compromise, such as other benefits or guarantees.]

OCG: General Opening clauses in collective agreement
1 = agreements contain general opening clauses, defined as renegotiation of contractual provisions at lower levels, under specified conditions
0 = agreements contain no opening clauses

Government Intervention:
5 = the government imposes private sector wage settlements, places a ceiling on bargaining outcomes or suspends bargaining;
4 = the government participates directly in wage bargaining (tripartite bargaining, as in social pacts);
3 = the government influences wage bargaining outcomes indirectly through price-ceilings, indexation, tax measures, minimum wages, and/or pattern setting through public sector wages;
2 = the government influences wage bargaining by providing an institutional framework of consultation and information exchange, by conditional agreement to extend private sector agreements, and/or by providing a conflict resolution mechanism which links the settlement of disputes across the economy and/or allows the intervention of state arbitrators or Parliament;
1 = none of the above.

OCT: Crisis-related, temporary opening clauses in collective agreement
1 = agreements contain crisis-related opening clauses, defined as temporary change, renegotiation or suspension of contractual provisions, under defined hardship conditions
0 = agreements contain no opening clauses

Minimum Wage Setting
0 = No statutory minimum wage, no sectoral or national agreements
1 = Minimum wages are set by (sectoral) collective agreement or tripartite wage boards in (some) sectors;
2 = Minimum wages are set by national (cross-sectoral or inter-occupational) agreement ("autonomous agreement") between unions and employers;
3 = National minimum wage is set by agreement (as in 1 or 2) but extended and made binding by law or Ministerial decree;
4 = National minimum wage is set through tripartite negotiations;
5 = National minimum wage is set by government, but after (non-binding) tripartite consultations;
6 = Minimum wage set by judges or expert committee, as in award-system;
7 = Minimum wage is set by government but government is bound by fixed rule (index-based minimum wage);
8 = Minimum wage is set by government, without fixed rule.

[Note: "this coding reflects the (increasing) degree of government intervention and discretion in setting the minimum wage, or – reversely – the degree to which the government is bound in its decisions by unions and employers, and/or fixed rules."]

Adjusted Bargaining (or union) Coverage Rate
(0-100) = employees covered by collective (wage) bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining, expressed as percentage, adjusted for the possibility that some sectors or occupations are excluded from the right to bargain = WCB*100/(WSEE-WStat).

Union Centralization
(0-1) = given by $\sqrt{}$[(Cfauthority*DEME*Hcf) + (Affauthority*DEMI*Haff)], weighting the degree of authority or vertical coordination in the union movement with the degree of external and internal unity, and union concentration or horizontal coordination, taking account of multiple levels at which bargaining can take place and assuming a non-zero division of union authority over different levels (see Visser, 1990; Iversen, 1999). Taking the square root serves to magnify the differences at the low end of this scale (cf. Iversen, 1999: 53)

[Note: This is a summary measure of centralization of wage bargaining, taking into account both union authority and union concentration at multiple levels (derived from Iversen's centralisation index)]

Cfauthority: authority of confederation over its affiliates
(0-1): additive measure over Cfrep, Cfappt, Cfagr, Cffund and Cfveto, divided by maximum score (=10).

DEME: External demarcations between union confederations
2 = sharp (political, ideological, organisational) cleavages associated with conflict and competition 1.5 = moderate (occupational, regional, linguistic, religious) cleavages, limited competition
1 = no cleavages – united confederation

Hcf: Membership concentration at central or confederal level (Herfindahl index at central or peak level)
(0-1) = given by ∑i n (pi2), where pi is the proportion of total membership organized by the *ith* confederation and is the total number of confederations.

Haff: Membership concentration at the industry level, within confederations (Herfindahl index at sectoral level)
(0-1) = given by Σ i n (pi2), where pi is the proportion of total membership organized by the *ith* affiliate and n is the total number of affiliates. Σ Aff1 n (pi2), where p denotes the fraction of total membership organized by the *ith* affiliate and n is the total number of affiliates. This variable measures the degree of concentration or fragmentation regarding bargaining units at the industry or occupational level.

Unauthority: authority of union (affiliate) over their local or workplace branches and representatives .
(0-1): additive measure over Unagr, Unappt, Unfin, Unfund and Unveto, divided by maximum score (=10).

Appendix 1B: Case Information

OECD COUNTRIES

Non-EMU/EU	EMU	EU
Australia	Austria (1999)	Austria (1990)
Canada	Belgium (1999)	Belgium (1958)
Japan	Finland (1999)	Czech Republic (2004)
New Zealand	Germany (1999)	Denmark (1973)
US	Greece (2001)	Finland (1995)
	Ireland (1999)	France (1958)
	Italy (1999)	Germany (1958)
	Netherlands (1999)	Greece (1981)
	Portugal (1999)	Hungary (2004)
	Slovakia (2009)	Ireland (1973)
	Spain (2009)	Italy (1958)
	Luxembourg (1999)	Luxembourg (1958)
		Netherlands (1958)
		Poland (2004)
		Portugal (1986)
		Slovakia (
		Spain (1986)
		Sweden (1995)
		Slovakia (2004)
		Spain (1986)
		UK (1973)

Country-Years

Australia	2000, 2008
Austria	2005, 2008, 2010, 2013
Belgium	2000, 2002, 2008, 2013
Canada	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2012 (no data for 90/10 wage differential)
Czech	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Denmark	2009, 2010, 2013
Finland	2000, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013
France	2004, 2008, 2009, 2012
Germany	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011
Greece	2004, 2005, 2006, 2008, 2011
Hungary	2001, 2003, 2005, 2007, 2012
Luxembourg	2010
Ireland	2000, 2005, 2009
Italy	2000, 2010
Japan	2000, 2005, 2006, 2007, 2008, 2010, 2011, 2012
Netherlands	2002, 2006, 2010
New Zealand	2000, 2001, 2002, 2003, 2007, 2010, 2011
Norway	2002, 2006, 2009
Poland	2007
Portugal	2006, 2008, 2010, 2011
Slovakia	2002, 2004, 2006, 2007, 2008, 2009, 2011, 2013
Spain	2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012
Sweden	2000, 2002, 2005, 2007, 2011
Switzerland	2010, 2012
UK	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2012, 2013
US	2000, 2001, 2003, 2005, 2008, 2009

Appendix 1C

Figure 1: Centralization of Wage Bargaining

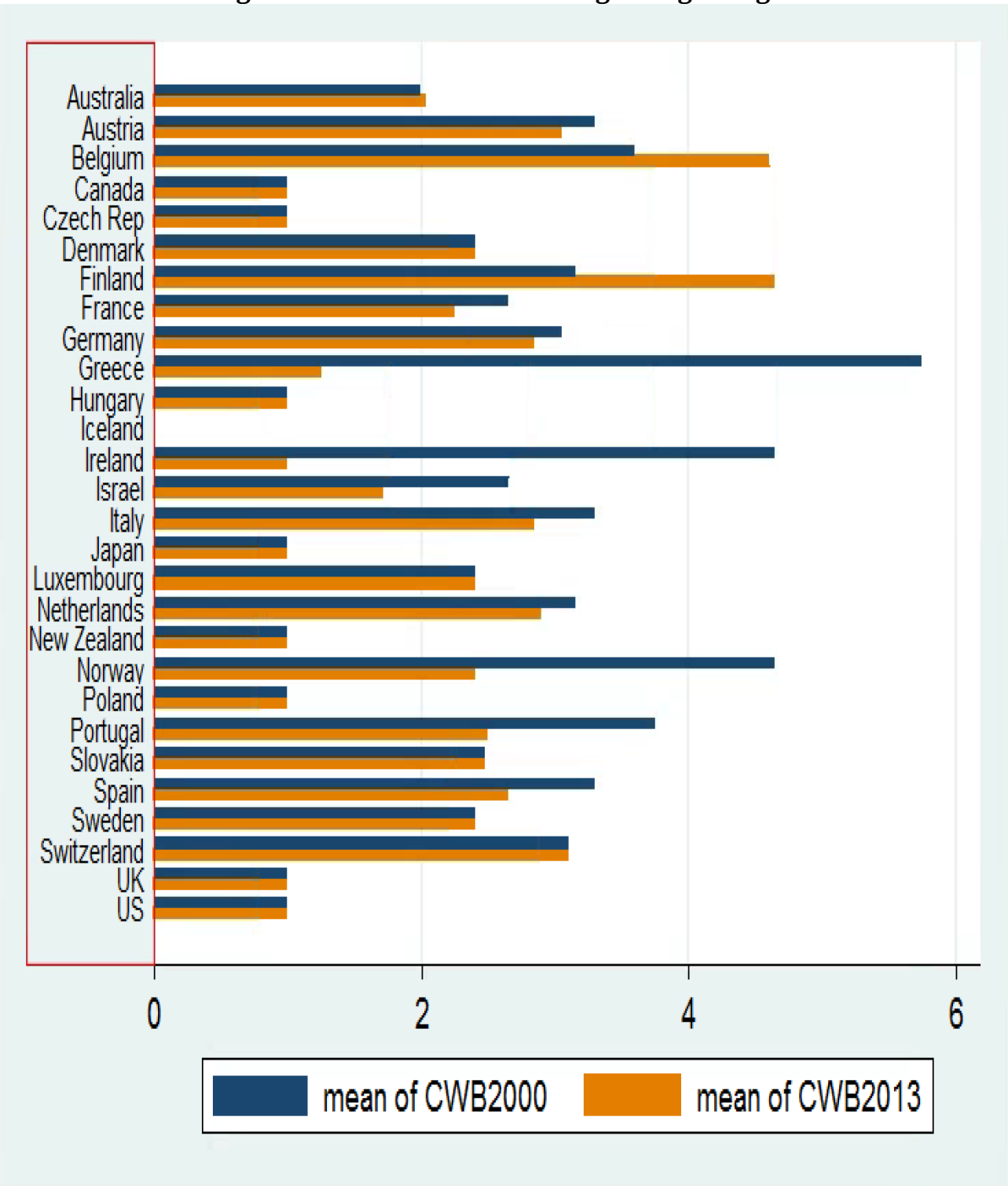


Figure 2: Government Intervention

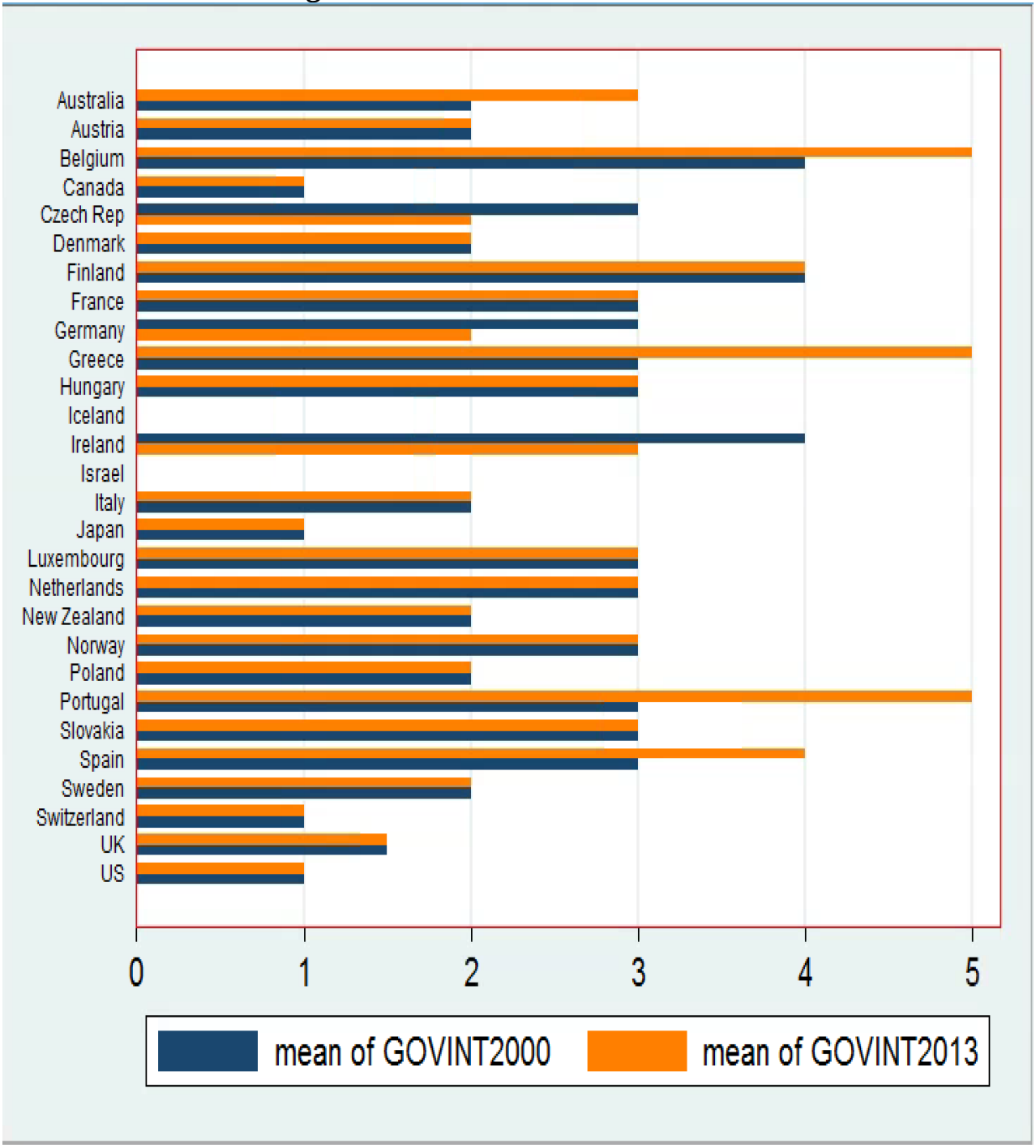


Figure 3: Coordination of Wage Bargaining

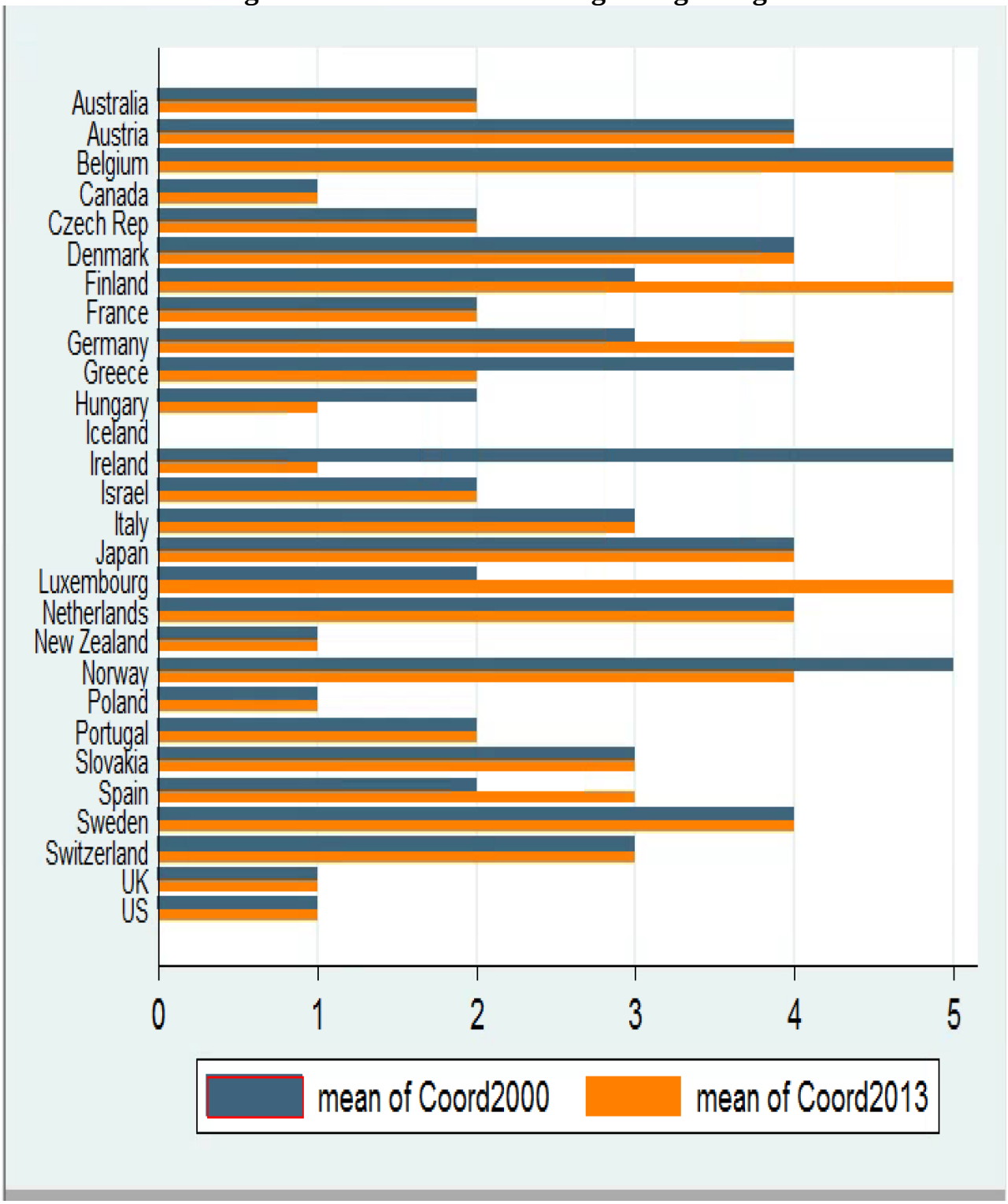


Figure 4: 50/10 Wage Dispersion

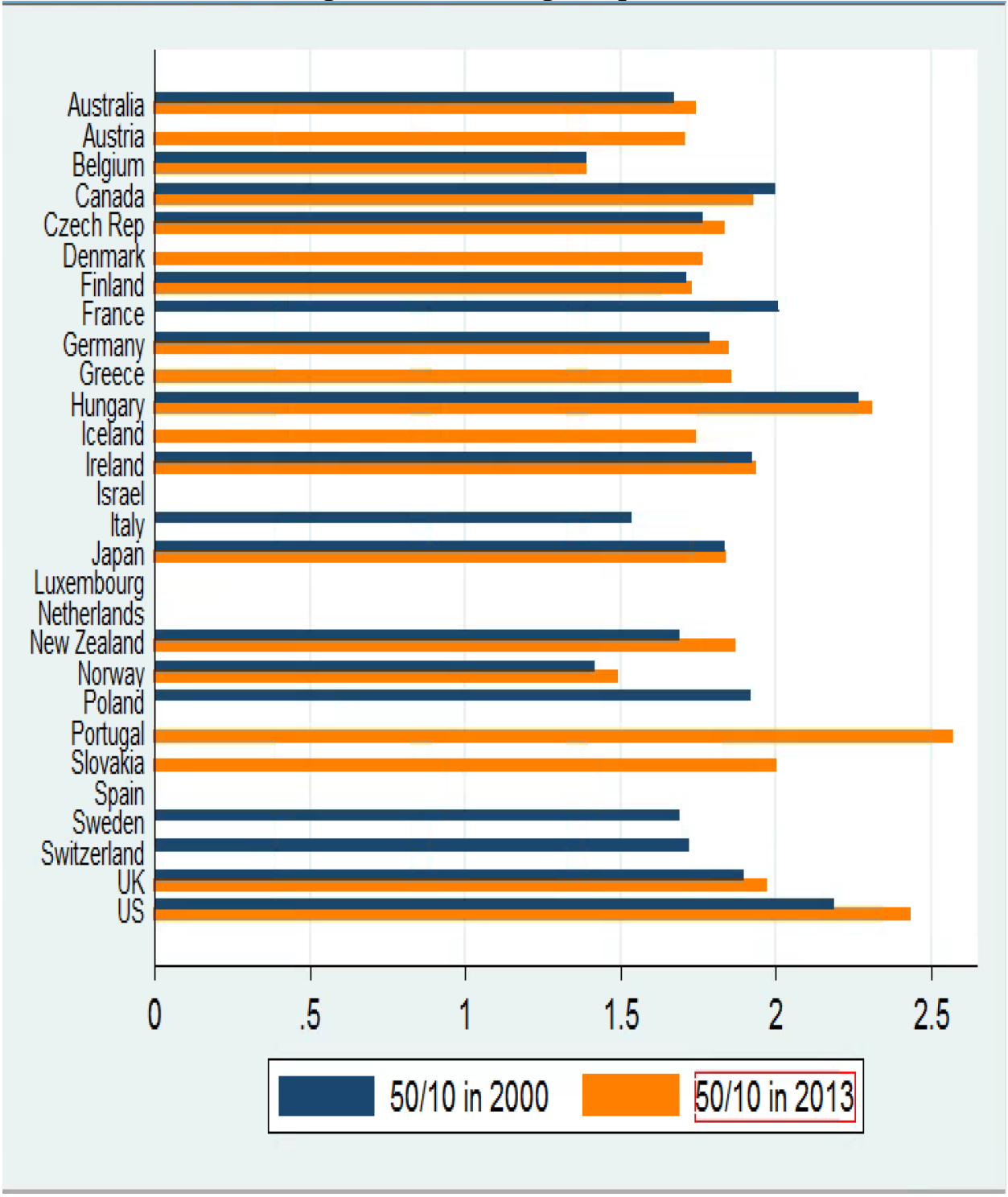


Figure 5: 90/50 Wage Dispersion

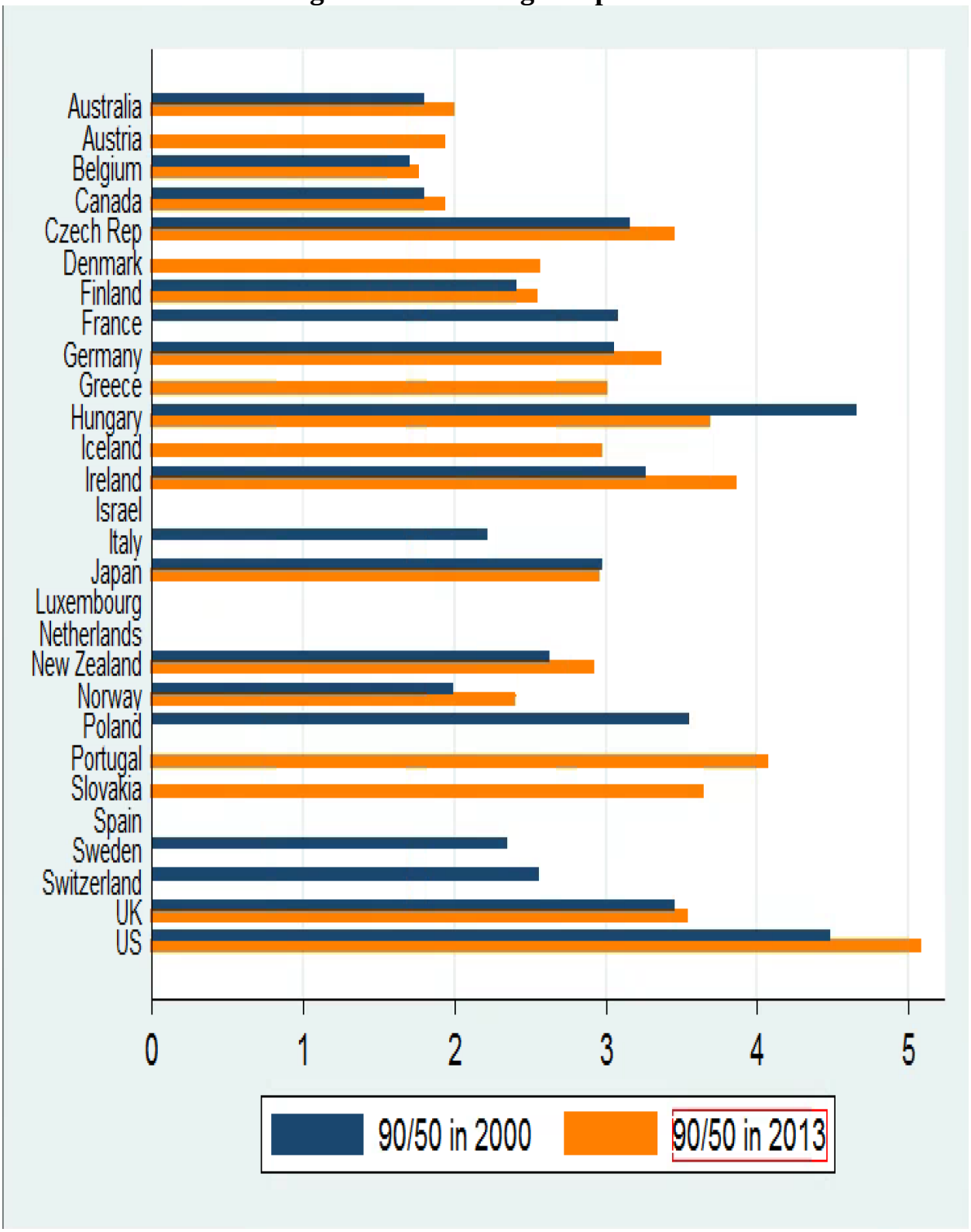
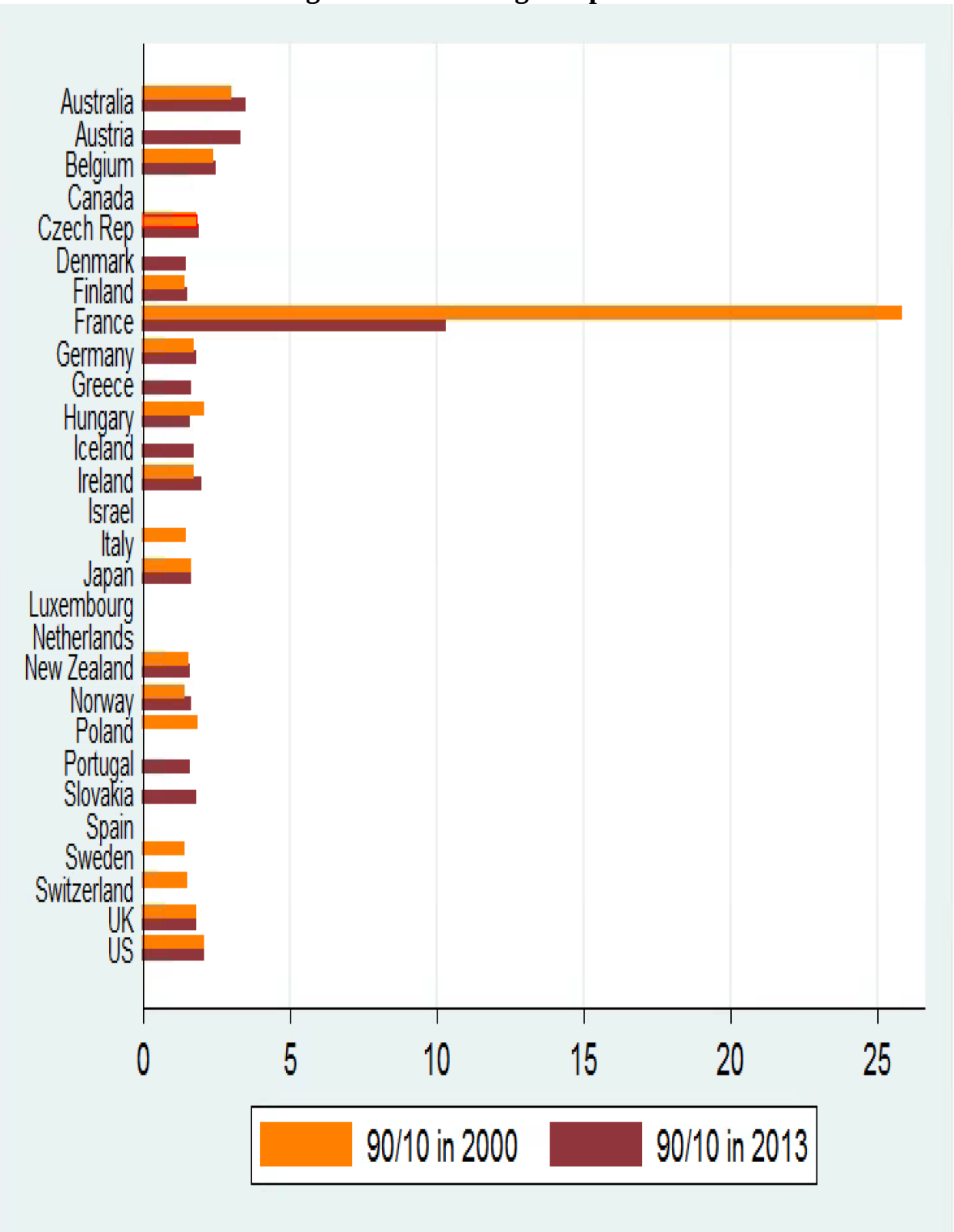


Figure 6: 90/10 Wage Dispersion



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