The Political Economy of Extreme Work Hours in Western democracies

by

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Declaration

I hereby declare that no parts of the thesis have been accepted for any other degrees in any other institution. This thesis contains no materials previously written and/or published by another person, except where appropriate acknowledgement is made in the form of bibliographical reference.

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Abstract

Work time is an important element of how political economies are organised. The number of hours on the job is not only related to the effort people exert at work, but also determines the time that she or he has left to pursue other activities in life. Therefore, work time is an important measure of well-being and quality of life. Contrary to John Maynard Keynes' 1930 prediction, economic prosperity has not brought about a dramatic shortening of the work week in the developed world. Today, with an increasing number of full-time workers working more than 50 hours per week and an increasing number of involuntary part-timers, the reconciliation of work and life is far from being achievable for many people in the advanced West.

This dissertation examines different aspects of the prevalence of very long, or extreme, weekly work hours in Western European and North American societies. Empirically, it documents diverging patterns of extreme work hours across Europe since the 1970s, using a novel meta-database of extreme work hours. Whereas in France and Scandinavia, the proportion of extreme work hours remained relatively low, in most other European countries it has radically increased.

Theoretically, the dissertation proposes three major contributions to existing political economy literature. First, in Chapter II, it provides a macro-institutionalist argument against the neoclassical, or supply-side, point of view on the drivers of long work hours in post-industrial labour markets. It demonstrates that the choice whether to work long hours is not entirely, or even mainly, left to the preference of the individual. Instead, individual choices are constrained by labour market policies, collective bargaining institutions, and new labour market structures, the pattern and trends of which do not necessarily follow the contours of the welfare regime typology.

Second, in Chapter IV, through a micro level analysis, the dissertation argues that extreme work is an important obstacle in the maturing of the female revolution. The high prevalence of very long work hours among the full-time employed makes it difficult for women to pursue the dual ambition of career and motherhood for two main reasons. First, as it is hard to reconcile the needs of children with an extreme job, many women self-select themselves into occupations below their skills in exchange for a better work-life balance. Second, women with an extreme worker partner face an elevated risk of falling in the long-term trap of part-time employment or inactivity. This translates into major losses of productive forces at the macro level.

Third, in Chapter V, using extreme work as an instrument to measure changes in labour market structures, the dissertation argues that the rise in top income concentration is deeply rooted in structural changes in the labour market. Post-industrialism has restructured labour markets in a profound way, giving rise to a qualitatively different high-skilled labour market segment, a 'winner-

take-all' segment, in which the constellation of weak labour representation and fierce competitive pressures has given rise to new type of vulnerabilities and unprecedented income inequalities among workers.

Table of contents

Chapter I. Introduction

1. Overview

Work time is an important element of how political economies are organised. The number of hours on the job is not only related to the effort people exert at work, but also determines the time that she or he has left to pursue other activities in life. Therefore, work time is an important measure of well-being and quality of life. Contrary to John Maynard Keynes' 1930 prediction, economic prosperity has not brought about a dramatic shortening of the work week in the developed world. Today, with an increasing number of full-time workers working more than 50 hours per week and an increasing number of involuntary part-timers, the reconciliation of work and life is far from being achievable for many people in the advanced West.

This dissertation examines different aspects of the prevalence of very long, or extreme, weekly work hours in Western European and North American societies. Empirically, it documents diverging patterns of extreme work hours across Europe since the 1970s, using a novel meta-database of extreme work hours. Whereas in France and Scandinavia, the proportion of extreme work hours remained relatively low, in most other European countries it has radically increased. In other words, the work-hour profile of many European full-time workers has converged toward the US-American pattern: an increasing ratio of Europeans have become overworked since the beginning of the 1990s.

Theoretically, the dissertation proposes three major contributions to existing political economy literature. First, in Chapter II, it provides a macro-institutionalist argument against the neoclassical, or supply-side, point of view on the drivers of long work hours in post-industrial labour markets. It demonstrates that the choice whether to work long hours is not entirely, or even mainly, left to the preference of the individual. Instead, individual choices are constrained by labour market policies, collective bargaining institutions, and new labour market structures, the pattern and trends of which do not necessarily follow the contours of the welfare regime typology.

Second, in Chapter IV, through a micro level analysis, the dissertation argues that extreme work is an important obstacle in the maturing of the female revolution. The high prevalence of very long work hours among the full-time employed makes it difficult for women to pursue the dual ambition of career and motherhood for two main reasons. First, as it is exceedingly hard to reconcile the needs of children with an extreme job that requires more than 50 hours of work per week, many women self-select themselves into occupations below their skills in exchange for a better work-life balance. Second,

women with an extreme worker partner face an elevated risk of falling in the long-term trap of part-time employment or inactivity. This translates into major losses of productive forces at the macro level.

Third, in Chapter V, using extreme work as an instrument to measure changes in labour market structures, the dissertation argues that the rise in top income concentration is deeply rooted in structural changes in the labour market. Post-industrialism has restructured labour markets in a profound way, giving rise to a qualitatively different high-skilled labour market segment, a 'winner-take-all' segment, in which the constellation of weak labour representation and fierce competitive pressures has given rise to new type of vulnerabilities and unprecedented income inequalities among workers.

2. Empirical trends: Extreme work hours in the advanced West since the 1970s

To provide a first look at extreme work hour patterns across the advanced West, Figure 1 illustrates the main longitudinal trends in Western European and North American countries. All four scatterplots depict country-year observations on the proportion of extreme work hours among full-time workers between 1970 and 2010. Extreme work hours are operationalized as weekly work hours of 50 or more. The upper left panel illustrates a general increasing trend in the proportion of extreme work hours. The upper right panel illustrates an even more pronounced increasing trend among the high-skilled population. To show that the trends are not merely driven by observations from the United States and Canada, the lower panels show qualitatively similar results for European countries only. The lower panels offer three important insights.

First, countries with the lowest proportion of extreme work after 1990 include Norway and France. Countries with the highest incidence of extreme work in the same period include the European Anglo-Saxon countries (UK, Ireland) and some of the Continental European welfare states (Austria, the Netherlands, Germany, and Spain). The great variation suggests that work time patterns are not inherent in post-industrial development: they cannot be a deterministic consequence of common large-scale trends in openness, the pace of de-industrialization, and the concomitant technological change affecting all advanced economies.

Second, apart from France and the Nordic states, we see a significant rise in extreme work after 1990 in all countries for which data was available. Around 1980, extreme work was a marginal phenomenon in Western European countries. By the end of the 1990s, however, European labour markets become more diverse. In a small group of countries, including France and the Nordic countries, the incidence of extreme hours remained low. Meanwhile, other European countries shifted away from a balanced

work time pattern to a more polarized one, with a sizeable proportion of their population working more than 50 hours per week. In fact, the biggest increases are detected in the labour markets of Continental European countries (Austria, the Netherlands, Germany, Luxembourg, Belgium, and Italy). To the 1990s, the share of extreme workers has doubled in the Netherlands, Germany, Luxembourg, and Belgium. In Austria and Italy, the same ratio has tripled.

Finally, among high-skilled professionals, the increasing trend is more pronounced both in North America and in Western Europe. While in the 1970s, this group had the most balanced work time profile, to the 1990s high-skilled workers became the most time-deprived stratum of the workforce.

Figure 1

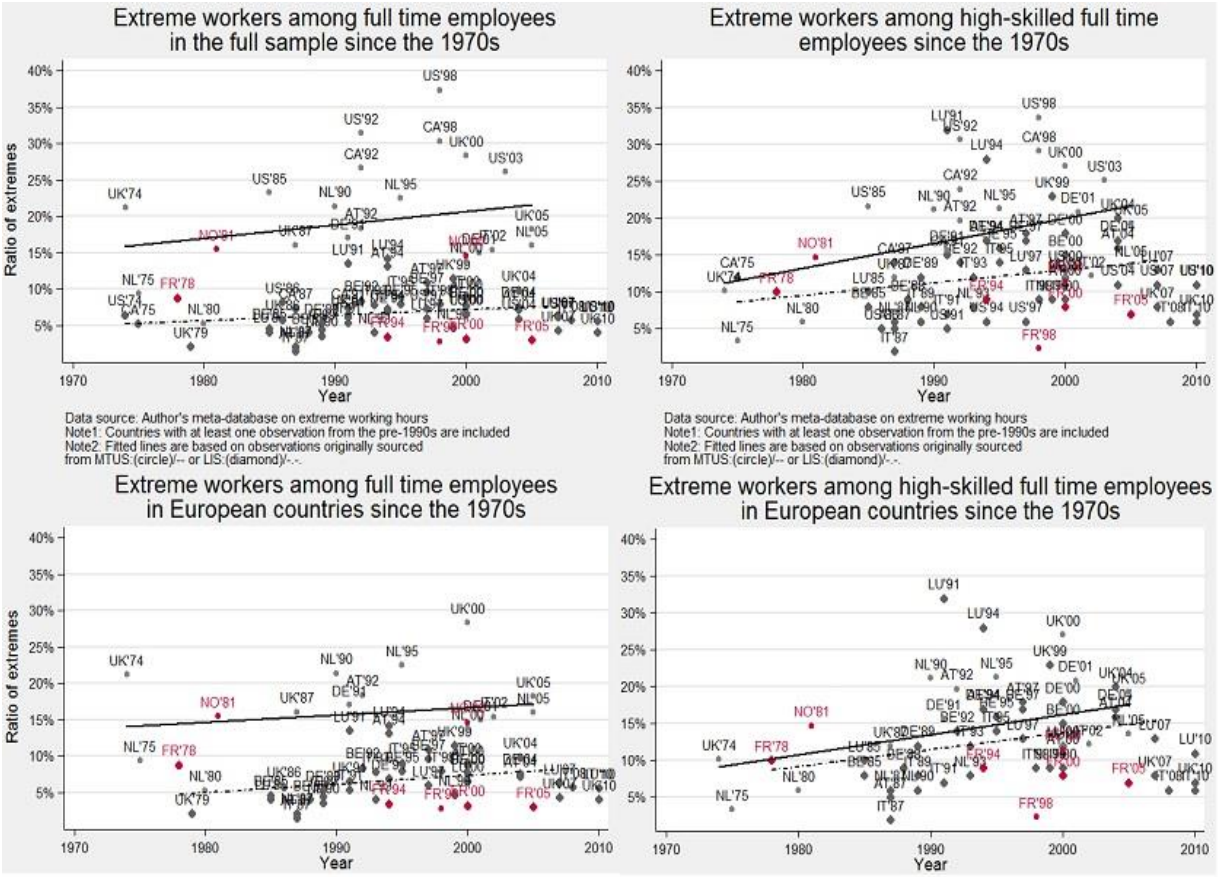


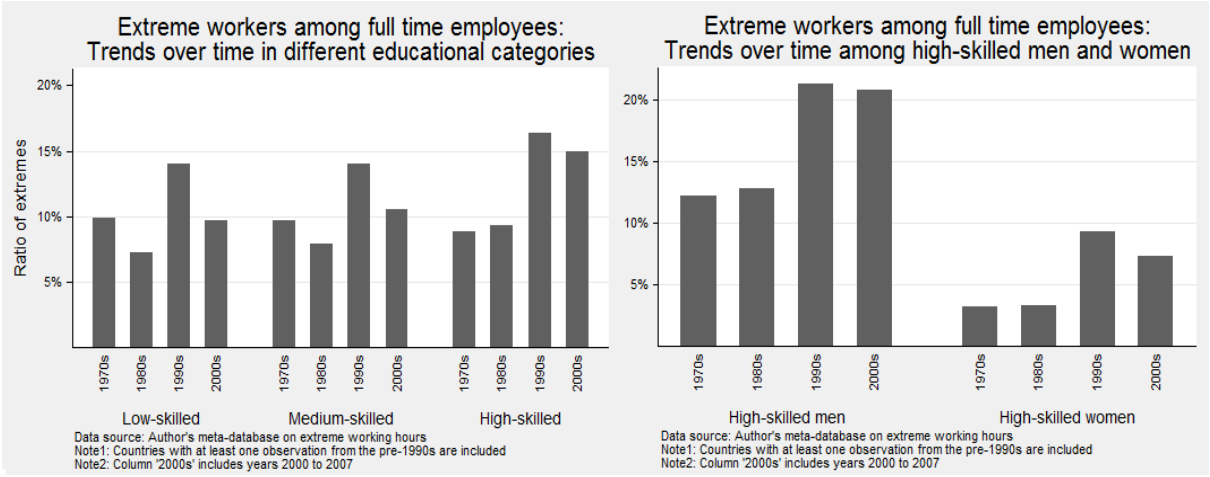
Figure 2 illustrates trends of extreme hours over time in a number of socio-economic subpopulations. The bar charts present decade averages of country-year level observations of the proportion of extreme work.

The left panel illustrates different trends among full-time workers in three educational categories: low-skilled workers (with less than secondary education completed), medium-skilled workers (with completed upper secondary education), and high-skilled workers (with at least one year of completed tertiary education). It shows that the trend in the proportion of long work weeks has increased in all

three educational categories, but the most radical increase occurred indeed in the high-skilled category.

The right panel points to an important aspect of the puzzle surrounding the transformation of work in post-industrialism. In the high-skilled segment of the workforce, the proportion of extreme work sharply increase among men but not among women. While more than one in five high-skilled men worked 50 hours per week or more in the 2000s, the comparable figure was only one in twelve for women. Equally striking is the fact that this two-to-three-fold gender difference was about the same in the 1970s. The fact that the gender difference has not diminished over the course of the past decades supports theories on the persistence of labour market segregation along the gender lines and the incomplete nature of the female revolution (Esping-Andersen 2009; Gerson 2009).

Figure 2



Overall, these empirical patterns present a puzzle for the literature on national work time regimes as the most radical increases in extreme work are detected in Continental European labour markets which are commonly celebrated as the champions of the short week movement (Bosch, et al., 1993; Berg et al., 2004).

3. The macro-institutional drivers of extreme work hours in post-industrial labour markets

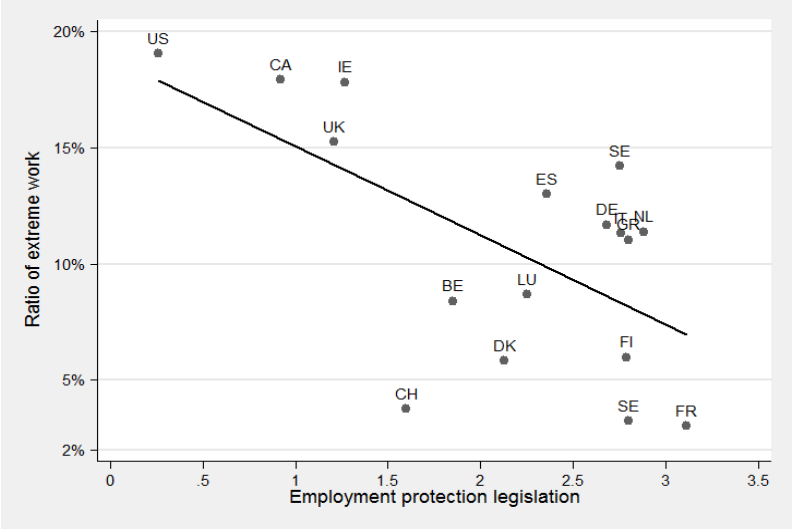
Neoclassical, or supply-side, theories explain the rise in the prevalence of extreme work hours by individuals' changing preferences. They suggest that workers freely opt to work long hours to reach their financial and social goals, or to find shelter from their problem-loaded (dual earner) households. In contrast to supply-side approaches, Chapter II of this dissertation, which was published on 19 April 2018 in *Socio-Economic Review* (https://doi.org/10.1093/ser/mwy020), proposes that the choice whether to work more than fifty hours per week is not entirely, or even mainly, left to the preference

of individuals but is guided by collective institutions. Individual choices are constrained by labour market policies, collective bargaining institutions, and changes in labour market structures that the state has failed to act upon.

The rise of extreme work in most Continental European countries and the Anglo-Saxon world occurred simultaneously to liberalizing trends in labour market policies and industrial relations arrangements over the past decades. In most Continental European and Anglo-Saxon countries, the stringency of employment protection legislation (EPL) stagnated or weakened, while union density rates and the level of bargaining centralization decreased.

Above all the institutional factors, cross-national differences in extreme work are driven by differences in the strength of EPL. As Figure 3 illustrates, there is a strong negative association between the two. Countries with strong EPL exhibit systematically lower levels of extreme work. This is likely because employment protection legislation contributes to the formation and maintenance of an organisational culture in which it is relatively difficult for employers to pressure people into working late.

Figure 3: The association between the prevalence of extreme work hours and the stringency of EPL



Note: The figure plots the ratio of extreme work hours (y-axis) against the stringency of EPL on regular contracts, sourced from the OECD (x-axis). Extreme work shares shown in the figure were calculated as averages over the period between 1990 and 2010 for each country.

Beyond setting labour market policies, the state influences work time patterns through various indirect channels. In general, a large and capable public sector can shore up a state's capacity in implementing policies that target adverse distributional patterns, including that of the proliferation of the long work hours culture.

The proportion of extreme work is further influenced by political drifts which result from political inactivity in the face of new economic structures. One such structural change is the widening division of labour markets into an insider and an outsider segment. The other is the employment growth in

non-shielded high-end service sectors. Both changes contribute to the emergence of new labour market vulnerabilities and deteriorating conditions of work, including the increasing proportion of extreme hours.

4. Who are the overworked Europeans? A gendered perspective

Earlier research on the regulatory and labour market obstacles of the maturing of the female revolution has identified a range of institutions which disincentivize women from engaging in paid employment after establishing a family. The lack of affordable child and elderly care, joint taxation regimes, employment insecurity and the circular trap of part-time employment are believed to be the most critical such obstacles. Chapter IV of this dissertation argues that the proliferation of the long work hours culture plays an equally crucial role in the incompleteness of the female revolution.

As a 50-hour work week is largely incompatible with family and childcare responsibilities, many women self-select themselves into occupations, often below their skills, which are not permeated by the long work hours culture. Correspondingly, the high incidence of extreme hours in high-status jobs provides a novel explanation on the persistence of the lack of gender equality in top positions. The extent to which gender plays a role in whether an individual works long hours varies significantly across Western European countries. In the United Kingdom and Germany, both gender and family status play a decisive role. In both countries, women tend to give up their extreme work once they get married and give birth to children, whereas men are increasingly likely to become extreme workers once they establish a family. On the contrary, in Sweden, one of the most mature welfare states, family status does not affect individuals' propensity to work extreme hours.

5. Extreme work as an instrument for measuring changes in labour market structures

Post-industrialism has restructured labour markets in a profound way, giving rise to new type of labour market vulnerabilities. The dissertation argues that labour market vulnerabilities do not stop at low-skilled 'outsiderness' but instead spread well into high-skilled professional labour markets, which once constituted the core of the insider segment. Liberalising trends in collective bargaining, intensified international competition among workers, and the disregard of the gender aspect throughout the development of corporate work cultures, all of which manifests themselves in the lengthening of the

full-time work week, have brought about the transformation of many high-skilled professions from 'insider' to 'winner-take-all' occupations.

In 'winner-take-all' occupations, as the name of the concept suggests, a few successful professionals reap a large share of overall benefits. Winners are in an exceptionally privileged labour market position, both in terms of remuneration and in terms of demand for their work. The privileged position of the winners is in striking contrast with the insecure position of the rest of the workforce in these professions. Because of winner-take-all labour market structures, young and mid-career professionals are increasingly facing the reality of a career path characterised by a sequence of unpaid or low-paid internships, fix-term and other forms of non-permanent contracts, with relatively poor prospects for job stability and, in general, worsening conditions of work, including the lengthening of the full-time work week.

6. Data sources and methodologies

The dissertation uses various data sources for its empirical analyses. Chapter II uses data from a novel meta-database of extreme work hours which has been directly sourced from two micro data collections: the Luxembourg Income Study database and the Multinational Time Use Study. Besides, it uses publicly available macro data from OECD, Amsterdam Institute for Advanced labour Studies, Armingeon Comparative Political Dataset, Fraser Institute and UNCTAD. Chapter III provides a detailed description of the data compilation and harmonisation process leading toward a unique meta-database of extreme work hours. Chapter IV and V analyses harmonised European Union Labour Force Surveys (EU-LFS), to which access was requested and given by Eurostat. The focus of analysis in Chapter II is at the macro level, in Chapter IV at the micro level and in Chapter V at the occupational (meso) level.

The theoretical propositions in Chapter II, IV and V are supported by empirical analyses using descriptive and inferential statistical methods. In each analytical chapter, the analysis goes beyond the revelation of simple correlations to disentangle the underlying causal relationships.

Chapter II. Extreme work hours in Western Europe and North America: Diverging trends since the 1970s

This chapter presents a political economy analysis of extreme work hours in eighteen advanced Western economies since the 1970s.[1] *Empirically, it shows that the culture of long work hours has gained significance not only in the Anglo-Saxon but also in most Continental European welfare states. Theoretically, it provides an institutionalist argument against the neoclassical, or supply-side, point of view on the drivers of long work hours in post-industrial labour markets. It demonstrates that the choice to work long hours is not entirely, or even mainly, left to the preference of the individual. Instead, individual choices are constrained by labour market policies, collective bargaining institutions, and new labour market structures, the pattern and trends of which do not necessarily follow the contours of the regime typology. Data on extreme work hours was compiled from the Luxembourg Income Study and the Multinational Time Use Study micro-data collections.*

1. Introduction

In the second half of the 19th century, scholars were increasingly concerned about the issue of work time. The legal limitation of the work day to eight hours was one of the most important demands of the early social-democratic and labour movements in Europe. The movement for the forty-hour work week was an answer to the dramatically changing conditions of work in the period of transformation from agricultural production to a predominantly industrial market structure. Before the first labour regulations were enacted, work days had often been extended to twelve or fourteen hours, six days a week, at the discretion of the employer. By the first decades of the 20th century, trade unions were organised, and strict work time regulation was successfully enacted in most Western European countries. Therefore, the topic seemed less relevant and received less focus in social science research

[1] This chapter was published on 19 April 2018 in *Socio-Economic Review*: https://doi.org/10.1093/ser/mwy020.

throughout the middle and second half of the 20th century. Then in 1991, when Juliet Schor (1991) presented evidence that US-Americans were spending significantly more time at paid work in the late 1980s than the 1960s, the topic of work time received renewed interest. Schor's revelation was surprising, and, at the same time, disappointing, as it suggested that during the transformation to post-industrialism, the fruits of technological advancements were, again, not used in a labour friendly manner.

Since then, Schor's main finding was repeatedly corroborated by labour market research that analysed time-use data and population surveys. In addition to an increase in average work hours, the proportion of people working extremely long hours has also increased in the United States since the 1970s (Coleman and Pencavel, 1993a,b; Leete and Schor, 1994; Clarkberg and Moen, 2001).

Regarding the trend in Western Europe, existing comparative work suggests that most Western European societies followed a qualitatively different path (Jacobs and Gerson, 1998; Bosch et al., 1993; Ausubel and Grübler, 1995; Bosch and Lehndorff, 2001; Alesina et al., 2005). As national average hours of work declined or stagnated in all Western European countries, the literature is dominated by accounts of the success of the 'short work week movement' in Europe (Bosch et al., 1993; Bosch and Lehndorff, 2001; Berg et al., 2004).

In contrast, the present study demonstrates that a deeper look at the higher end of European countries' work time distribution suggests a different narrative. In most European labour markets (including not only the Anglo-Saxon but most Continental European labour markets), declining or stagnating average hours mask a new and adverse work time tendency: the increasing prevalence of extreme work hours. In line with earlier literature (Jacobs and Gerson, 2004; OECD, 1998, 2015), very long hours, or extreme work hours, or extreme work, all used as synonyms throughout the article, are conceptualised and operationalised as fifty or more weekly work hours among the full time employed. With an increasing number of full-timers working more than fifty hours per week and an increasing

number of involuntary part-timers (OECD stats), the reconciliation of work and life might not be as achievable for many Europeans as it is suggested by existing studies of work time.

The negative repercussions of long work hours on individuals' health status, family and community life, as well as social cohesion are well-known. Devoting long hours to work increases the risk of burnout (Spurgeon et al., 1997) and has a negative impact on sleeping habits (Virtanen et al., 2009). Most people who regularly work long hours feel that their job not only undermines their health but also their spousal relationship (Hewlett and Luce, 2006). Furthermore, long work hours might result in the neglect of children (Folbre, 1994; Jacobs and Gerson, 1998) and a reduction in fertility rates (Bettio and Villa, 1993).

As women are still the primary caregivers in Western societies (Esping-Andersen, 2009), a rat race type of competition for long work hours creates a work environment in which women are less able to compete than men (Landers et al., 1996). Thus, the long work hours culture is an impalpable hindrance to gender equality, particularly in high-skilled labour markets (Bertrand et al., 2010; Hewlett and Luce, 2006; Burke, 2009; Gerson, 2009).

Yet, despite its far-reaching repercussions, we know surprisingly little about the comparative patterns and institutional foundations of this re-emerging phenomenon. Most studies on very long work hours concentrate on the United States (Coleman and Pencavel, 1993a,b; Figart and Golden, 1998; Jacobs and Gerson, 1998) and explain the proliferation of extreme work hours by supple-side preferences, that is, by individuals' voluntary choices for longer work weeks (e.g. Bowles and Park, 2005; Hochschild, 1997). Rather surprisingly, the scholarship taking a demand side point of view on the analysis of long work hours is still in its infancy. Micro level sociological studies show that long work hours are oftentimes not in line with individuals' self-reported preferences (Clarkberg and Moen, 2001), but they do not investigate the structural forces behind these incongruences. The few comparative studies that emphasise the role of institutions in shaping work time rely extensively on the premises of Esping-

Andersen's welfare regime approach, thus, they are unable to explain polarising work time trends in Continental Europe.

To fill the gap in comparative work time scholarship, this article provides an empirical and a theoretical contribution. Empirically, it analyses the patterns and trends of extreme work hours in Western Europe and North America since the 1970s. Using data from the Luxembourg Income Study (LIS) and the Multinational Time Use Study (MTUS) data collections, it shows that the proportion of extreme work hours has increased not only in the Anglo-Saxon but also in most Continental European labour markets. As the latter group is commonly celebrated as the champion of the short work week movement (Bosch 2000; Berg et al, 2014; Burgoon and Baxandall, 2004), our empirical results present a puzzle for the literature on national work time regimes.

Theoretically, the paper provides an institutions-based argument against the neoclassical, or supply-side, view on the drivers of extreme work in post-industrial labour markets. Drawing on the rich political economy literature that links the capacity of macro-institutions to differences in distributional outcomes (Martin and Thelen, 2007; Thelen, 2014; Rueda, 2006; Baccaro and Howell, 2011) and the literature on the complementarity and coherence of institutions (Hall and Soskice, 2001; Hancké, 2009; Witt and Jackson, 2016), this article demonstrates that the choice whether to work long hours is not entirely, or even mainly, left to the preference of the individual but is guided by policy and collective socio-economic institutions. Contrary to conventional wisdom, the most relevant work time tendencies of the past decades are shaped by liberalising trends in labour market policies, industrial relations arrangements, and labour market structures not only in the Anglo-Saxon world but also on most parts of Continental Europe, rather than by regime-conform developments.

The theoretical expectations are tested on eighteen Western political economies at the macro- and the broad skills-based meso-level. The article identifies not only the cross-national variety in institutional drivers but also the impact of political inaction in the face of changing market structures, especially at the bottom and top of the broad skills scale.

The remainder of this article is structured as follows. The next section situates the theoretical argument within debates on the drivers of long work hours in post-industrial labour markets. Section 3 explicates in detail how institutions shape extreme work time. Subsection 4.1 discusses the data and methodology used for the empirical analysis. Subsections 4.2 and 4.3 present the main empirical patterns and trends in extreme work since the 1970s. Section 5 supports the theoretical proposition empirically. Finally, Section 6 concludes the analysis and suggests implications for comparative political economy.

2. The debate on the drivers of long work hours

Existing theories on the drivers of long work hours use either of two opposing lines of arguments. The first approach takes a supply-side point of view assuming that long hours of work represent workers' preferences. That is, based on their preferences, workers decide voluntarily whether to work long hours on a daily and weekly basis.

The most widely articulated supply-side driven argument draws on the consumption theory of Thorsten Veblen, a nineteenth century economist-sociologist. In a 21st century interpretation of the theory, the 'Veblen effect' is evoked to explain that people choose to work more hours to earn enough so that they can emulate the consumption standards of the very rich (Schor, 1998). Bowles and Park (2005) place this argument in a historical perspective by arguing that rising income inequality contributes to the manifestation of the Veblen effect because the pulling away of top incomes further increases the gap in consumption standards between the wealthy and the rest of the population.

In a similar vein, neoclassical economic theory provides a supply-side driven explanation. According to the standard textbook argument (Varian, 2014), high earners choose to work longer hours because it is too expensive for them not to do so: due to the 'substitution effect', the price of substituting an extra hour of work with leisure is more expensive for high earners than it is for those earning less. Thus, high earners make a free rational choice when opting for more hours of work.

Though approached from a different angle, the sociological theory of Hochschild (1997) provides a corroboration to neoclassical arguments about workers' preferences for long work hours. She suggests that with the increase of the dual earner household model, it has become more difficult for workers to reconcile family and work responsibilities. Many couples live under constant time pressure which often leads to having a neglected home and problems with their children. It is thus precisely difficulties at home, as Hochschild maintains, that drives people back to work – a sphere of life where they are more likely to be able to keep things under control and eventually reap success.

The supply-side approach has been criticised by scant literature taking a demand-side point of view. Micro-level sociological studies compare individuals' stated preferences with their actual hours of work from surveys to show that much of the overtime of full-timers is involuntary (Clarkberg and Moen, 2001; Reynolds, 2004; Baslevent and Kirmanoglu, 2014; Crompton and Lyonette, 2006;). From a methodological point of view, this approach has the disadvantage of making cross-national comparisons difficult as preferences for work hours is a subjective measure that systematically varies across cultures. It is thus at least partly for methodological reasons that these works either concentrate on the individual level drivers (age, gender, family status, etc.) of long daily and weekly work schedules rather than the effect of the national institutional environment, or they analyse separate micro-level models and then compare a few cases qualitatively.

Approaching the question from a macro-political frame of reference, the literature on national work time regimes provides a methodologically and conceptually important demand-side contribution to the debate (Berg et al., 2004; Berg et al., 2014; Burgoon and Baxandall, 2004; Rubery et al., 1998; Mutari and Figart, 2010). In particular, it introduces a power resources logic (Korpi, 1983; Stephens, 1979) into work time analysis by explicating how policy institutions constrain employers in their ability to control workers' actual work time, as well as individual workers' actual palette of choices for work hours. However, by relying as a reference on the welfare regime paradigm, and focusing on the

coexistence, or configuration, of a range of work time practices, its contribution to the debate on long work hours remains to be mainly conceptual rather than substantive.

To gain a better understanding of the type of contribution that the literature on national work time regimes provides, it is worth highlighting the relevant results of two key articles. Berg et al. (2014) identify three work time configurations in Western democracies which they define by a range of work time practices. They postulate that the configurations emerge from dissimilar power relations between the state, employers and worker representatives. They characterise the 'unilateral' configuration (with the country example of the US) by employers' control over work time, the 'negotiated' configuration (with the country example of Sweden) by extensive tripartite negotiations, while the 'mandated' configuration (with the country example of France) by the strong role of the state in shaping work time practices. The question in which category other Continental European countries best fit is left unanswered.

Burgoon and Baxandall (2004) explicitly argue that Esping-Andersen's three regime types generate three worlds of work time. They propose that regime-specific policies and welfare institutions shape three distinct constellations of work time practices, which are discernible on two work time indicators: annual work hours per persons employed and per total working-age population. From the analysis of these two indicators, they suggest that Continental welfare states are the "champions" of the short work week movement (Burgoon and Baxandall, 2004, p. 447).

Building on the power resources logic introduced into work time analysis by the literature on work time regimes, but focusing on the prevalence of extreme work, the present study demonstrates that the literature was too quick in enunciating the group of Continental European welfare states as the forerunners in the race toward shorter work weeks. Critical changes in labour market structures and two political-economy institutions - labour market policies and collective bargaining institutions - opened the way to polarising work time tendencies not only in the Anglo-Saxon world but in most Continental European labour markets as well.

3. Theory and hypotheses on the role of macro-institutions

This paper proposes two main arguments on how the national political economy environment influences extreme work patterns. First, individuals' choices for allocating more than fifty hours per week to work are encouraged or constrained by a range of direct macro-institutions. The strength of employment protection legislation, unions, and whether unions are encompassing - that is, whether they represent all workers from low-skilled services through manufacturing to high-skilled services – play a crucial role in shaping the legal and practical framework within which individual choices for work hours take place.

Second, two recently revealed changes in labour market structures have similarly important impacts. One is the widening division of labour markets into an insider and an outsider segment (Rueda, 2006; King and Rueda, 2008; Palier and Thelen, 2010; Allmendinger et al., 2015). The other one is the growing size of the non-shielded high-skilled services sector (Wren, 2013), in which professionals are often exempt from all stipulations related to the regulation of work time (Gerson, 2009; Hermann, 2014). These tendencies create new labour market conditions which pave the way for the spreading of the long work hours culture at the bottom and the top of the skills scale. Following Hacker and Pierson (2010), the present study maintains that political inaction in the face of new structural circumstances creates a policy 'drift' in itself. A proper political economy analysis of extreme work must examine not only the direct impact of political economy institutions but also the indirect impact of political inaction in the face of structural changes.

As much of the changes in the institutional setup and labour market structures are not in alignment with the regime typology, this article moves beyond the broad clustering approach and examines the institutional factors in detail.

3.1 The role of institutions: labour market policies and collective bargaining institutions

Labour market policies. The most important policy pillar of extreme work is employment protection legislation rather than the regulation of work time. This argument contrasts with conventional wisdom, as work time practices are believed to be first and foremost shaped by the regulation of work time - e.g. the stipulation of and collective agreements on standard weekly hours, paid leave, and maximum work time (Bosch, 2000; Lehndorff, 2000; Mutari and Figart, 2010; Rubery et al., 1998; Burgoon and Baxandall, 2004).

Considering that fifty hours of work is above any standards (standard weeks typically range between thirty-seven and forty hours), and even above the forty-eight-hour maximum, as stipulated by the EU Working Time Directive, there is a compelling case for the notion that relative differences in the stringency of these standards do not directly influence extreme work patterns. Moreover, with the increasing use of the 'opt-out' clause – Article 11 (1) – of the EU Working Time directive across countries and industries[2], the number of workers who are exempt from regulation has been augmenting (Hermann, 2014), rendering this policy instrument even less effective.

In contrast, employment protection legislation (henceforth, EPL) plays a key role in guiding the work time norms of full-time employment in post-industrial labour markets. Through defining the basic power relations between employers and employees in the case of a disagreement, EPL acts as an important policy constraint against employer encroachment. If workers are well protected against individual dismissal, they are more likely to reject undesired overtime requests from their superiors. Employers are also less likely to pressure workers into staying late if employment protection puts a clear boundary on their power. In general, strong EPL contributes to the creation and maintenance of

[2] The opt-out clause effectively gives European countries the possibility to allow their employers to require more than forty-eight hours of work from their employees, provided that these consent to the exemption in advance. The opt-out is used in all sectors in the UK since 1993, in Malta, Cyprus, and Estonia since 2004, and in Bulgaria since 2007. Germany uses the opt-out in public health services, local police and firefighter services since 2003, and among federal civil service since 2008. Spain, France, the Netherlands, and Belgium introduced the opt-out only in public health services.

an organisational culture in which the conditions of work are not exclusively controlled by employers. Placing this argument in a macro context, it is suggested that EPL is the most important stand-alone policy institution that effectively diminishes the pressures coming from globalisation and post-industrial structural change toward longer and atypical work hours.

As the level of EPL is historically entrenched in advanced economies, it explains an important part of the cross-national variation in extreme hours but only a marginal part of the longitudinal trends. Anglo-Saxon countries have historically weak EPL and high proportions of extreme work while Continental European and Scandinavian countries have relatively strong EPL and lower proportions of extreme hours, though with immense within-group variation.

Collective bargaining institutions. A large part of the longitudinal trend in extreme work can be traced back to changes in industrial relations arrangements which do not follow the contours of the welfare regime typology. The literature on the new politics of social solidarity extensively analyses these changes and draws attention to some of their adverse distributional effects (Thelen, 2014; Streeck and Thelen, 2005; Martin and Thelen, 2007; Baccaro and Howell, 2011).

Scholars of the new politics of social solidarity identify either a uniform trend in the weakening of worker representation across Western Europe (Baccaro and Howell, 2011) or distinct varieties of liberalisation (Martin and Thelen, 2007). Beyond drawing attention to profound declines in union density and bargaining centralisation in large parts of Continental Europe, the most original contribution of these works lies in shedding light on unions' deteriorating capacity to represent workers in an encompassing manner.

More specifically, Thelen (2014) postulates that the gradual employment shift to services resulted in the erosion of traditional collective bargaining arrangements because union membership remained to be concentrated in manufacturing. In some countries (e.g. in Germany), cooperation between labour and capital even intensified while the growing services sectors remained underrepresented.

Consequently, formal institutional stability in terms of union density and bargaining levels might mask profound changes in unions' capacity and interest to represent all groups of workers.

The work time effect of these changes is relatively straightforward. With the growing importance of the 24/7 service economy, the proportion of service workers who are underrepresented in collective negotiations is increasing. The deteriorating representativeness of unions undermines their capacity and interest to counterbalance post-industrial pressures toward longer and atypical work hours in the low-skilled and the high-skilled services sectors. At the bottom of the skills scale, low-skilled workers provide services, such as serviced food and child care; high-skilled professionals provide high-end services, such as legal and business consulting.

State capacity. Besides labour market policies and collective bargaining institutions, extreme work is indirectly influenced by a range of policy areas, including educational, industrial policies and the rules of corporate governance. As a differentiated analysis of these indirect factors is beyond the scope of the article, we resort to theories on the coordinating capacity of the state (Martin and Thelen, 2007; Bustikova and Corduneanu-Huci, 2017; Acemoglu and Robinson, 2006) to emphasise and account for the influence of the state beyond the well-discernible institutional channels.

Differences in state capacity, broadly defined as bureaucratic authority, efficacy, and penetration within a national territory, are believed to explain paths of political development. More specifically, Martin and Thelen (2007) suggest that a large public sector enhances a government's political capacity to sustain macro-corporatist institutions that lead to more equal distributional outcomes and higher levels of social solidarity. Linking this argument to the study of long hours, this suggests that extreme work is less likely to be present in societies with a large and capable state apparatus than in others where state bureaucracy is confined to a minimalist role.

Finally, the size of the public sector might even have a "composition" effect. This effect could work through two channels. First, through maintaining good working conditions in the public sector (direct

effect), and, second, through influencing private sector practices by the conditions set for the public sector (setting standards).

3.2 The role of political inaction in the face of new labour market structures

Beyond the examination of the direct effect of policy institutions, a proper political economy analysis of extreme work must also examine the impact of political inaction in the face of new labour market structures. The long work hours culture has found a fertile soil in new tendencies that are reshaping the bottom and the top of the labour markets of Western societies.

At the bottom of the skills scale, an increasing number of workers are becoming labour market outsiders who are in atypical, or precarious, employment or unemployment (Lindbeck and Snower, 2001; Rueda, 2006; King and Rueda, 2008; Palier and Thelen, 2010; Allmendinger et al., 2015). The practice of very long hours is particularly wide-spread among outsiders for two reasons.

First, due to a lack of regulatory protection and high replaceability, outsiders are in a vulnerable position vis-à-vis their employers. Not complying with an employer's request for overtime might result in an outsider's immediate dismissal and replacement. Second, in many cases, outsiders consent to, sometimes even initiate, working very long hours in order for their income to reach subsistence level. In today's increasingly unequal economies, an ever-larger number of low-skilled workers must compensate for their relatively low hourly pay by allocating more time to work. While this decision is formally voluntary, in substance it is not because the choice is strongly shaped by the restrictive political economy environment.

At the top of the skills ladder, extreme hours are imposed on many high-skilled professionals by a different set of structural pressures. With the internationalisation of professional labour markets (Rodrik, 1997, Krings et el., 2009; Wren, 2013) and the increasing use of regulatory exemptions (Hermann, 2014), a race-to-the-bottom type of competition is prevailing on professional labour markets (Landers et al., 1996).

The advancements in information technology and the increased interconnectedness of post-industrial labour markets created a new labour market structure in which much of the barriers that once protected professionals from fierce competition with each other have been removed (Rodrik, 1997). In effect, many high-skilled professionals are now employed in non-shielded services (Wren, 2013), in which the conditions of work are profoundly shaped by competitive pressures coming from economic globalisation. Because of this, high-end service jobs in post-industrial labour markets do not provide the employment security and work-life balance that was once guaranteed by industrial white-collar jobs.

Existing policy institutions do not adequately target the adverse distributional effects of these new market structures. Labour market dualism and employment growth in high-end services provide a fertile soil for new labour market vulnerabilities, and deteriorating conditions of work, including the increasing proportion of extreme hours.

4. Trends and patterns of extreme work

4.1 Data and methodology

Data on the proportion of workers with extreme work hours in sixteen Western European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom), as well as Canada and the United States is sourced from two micro data collections: the Luxembourg Income Study Database (henceforth, LIS) and the Multinational Time Use Study (henceforth, MTUS). Both micro data collections contain numerous harmonised country-level surveys from various years, starting as early as the 1970s.

The macro level indicator - the share of workers working extreme hours - was calculated from hundred-and-four nationally representative surveys for twenty-four different socio-economic subgroups. These subgroups are formed by all combinations of three gender categories (female, male, all); four

educational categories (ISCED 0-2, ISCED 3-4, ISCED 5-6, all); and two employment statuses (full time worker, all in employment). The share of extreme workers was calculated from all LIS and MTUS surveys conducted between 1970 and 2010 in which individual respondents' age, gender, highest educational level, employment status, and weekly work hours were reported.

In line with earlier literature (Jacobs and Gerson, 2004; OECD, 1998, 2015), very long hours, or extreme work hours, or extreme work, all used as synonyms throughout the article - is operationalised as weekly work hours of fifty or more.

Descriptive and inferential statistics is conducted using indicators of extreme work over three different educational pools. This makes it possible to empirically identify not only the effect of macro-institutions but also the cross-cutting impact of changing market structures and education on the prevalence of extreme work.

Macro-indicators on EPL, union strength, the size of the public sector, labour market dualisation and economic globalisation are sourced from publicly available data from OECD, Amsterdam Institute for Advanced labour Studies, Armingeon Comparative Political Dataset 2013, Fraser Institute, and UNCTAD.

4.2 Cross-national patterns and trends

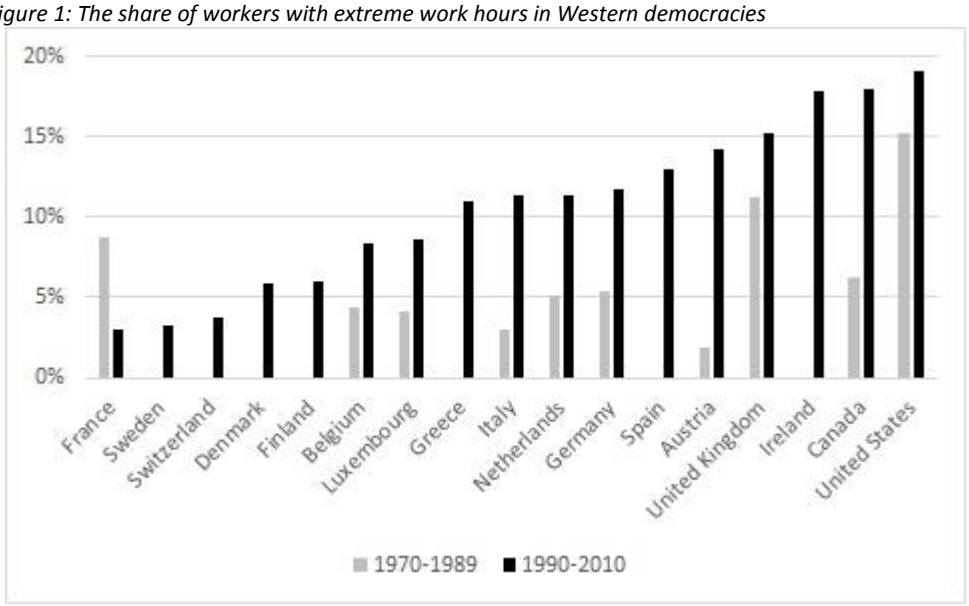
To provide a first look at extreme work patterns across Western democracies, Figure 1 shows the ratio of extreme workers to all full-time workers in Western European and North American countries in two periods: in 1) 1970-1989 (grey bars) and 2) 1990-2010 (black bars). Each bar shows a period average which was calculated from all available observations for the respective period. Countries are ranked by increasing order in the ratio of extreme work in 1990-2010. The graph offers two major insights.

First, countries with the lowest proportion of extreme work after 1990 include the Scandinavian states (Sweden, Denmark, Finland), and France. Countries with the highest incidence of extreme work in the same period include the North American countries (USA, Canada) and European Anglo-Saxon countries

(UK and Ireland). These are followed directly by some of the Continental European welfare states (Austria, the Netherlands, Greece, Germany, and Spain).

Second, apart from France, we see a significant rise in extreme work after 1990 in all countries for which data was available for both periods. In fact, the biggest increases in extreme work between the two periods are detected in the labour markets of Continental European countries (Austria, the Netherlands, Germany, Luxembourg, Belgium, and Italy). In the Netherlands, Germany, Luxembourg, and Belgium, the share of extreme workers has doubled. In Austria and Italy, the same ratio has tripled. In contrast, the share of extreme workers in France dropped to one of the lowest levels. For the Scandinavian states, no pre-1990 observations were available. However, the low proportion of extreme work after 1990 suggests that the rise in long hours, if at all, was marginal in Scandinavia.

Figure 1: The share of workers with extreme work hours in Western democracies



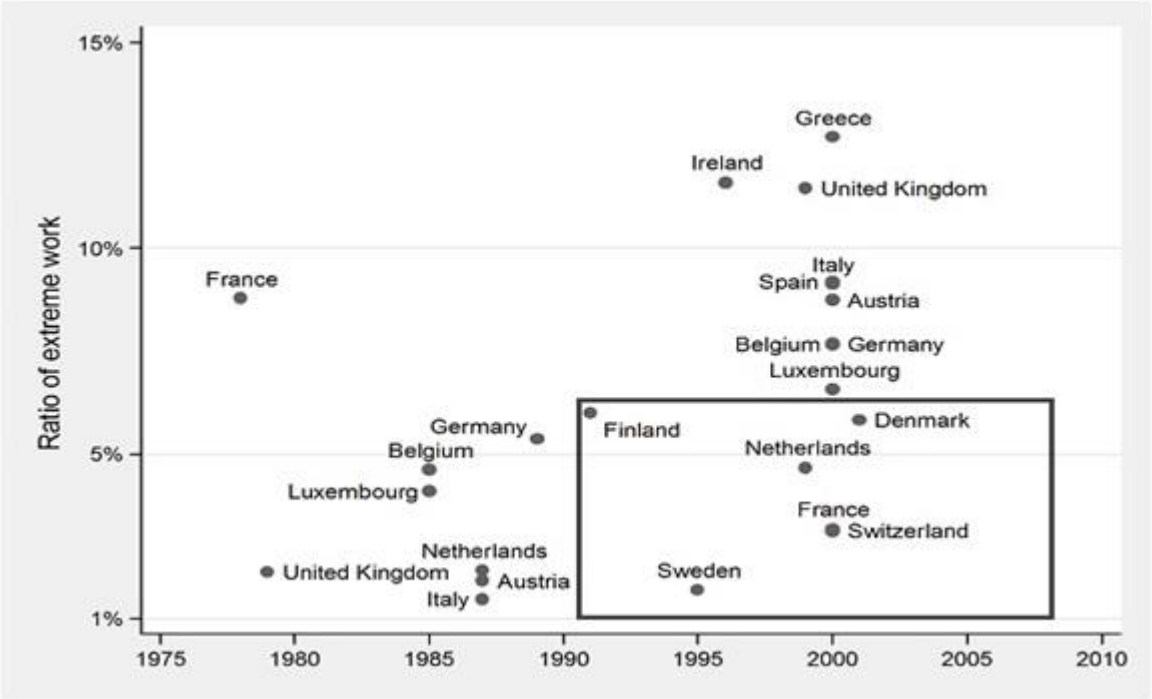
Note: The graph depicts period averages of the share of workers who work extreme hours in seventeen Western countries. The averages by country and period were calculated based on all available LIS and MTUS observations.

Figure 2 illustrates the cross-national variation and changes over time in extreme work in Western European countries only. The graph depicts one observation for each country for two periods: the observation closest to 1985 for the first period and one closest to 2000 for the second period.

As suggested by the graph, extreme work was a marginal phenomenon in Western European labour markets around 1985. By the end of the 1990s, however, European labour markets became more

diverse. In a small group of countries, including France and the Nordic countries, the incidence of extreme hours remained low. Meanwhile other European labour markets shifted away from a balanced work time pattern to a more polarised one, with a sizeable proportion of their population working more than fifty hours per week.

Figure 2: The share of workers with extreme work hours in Western European countries in two periods



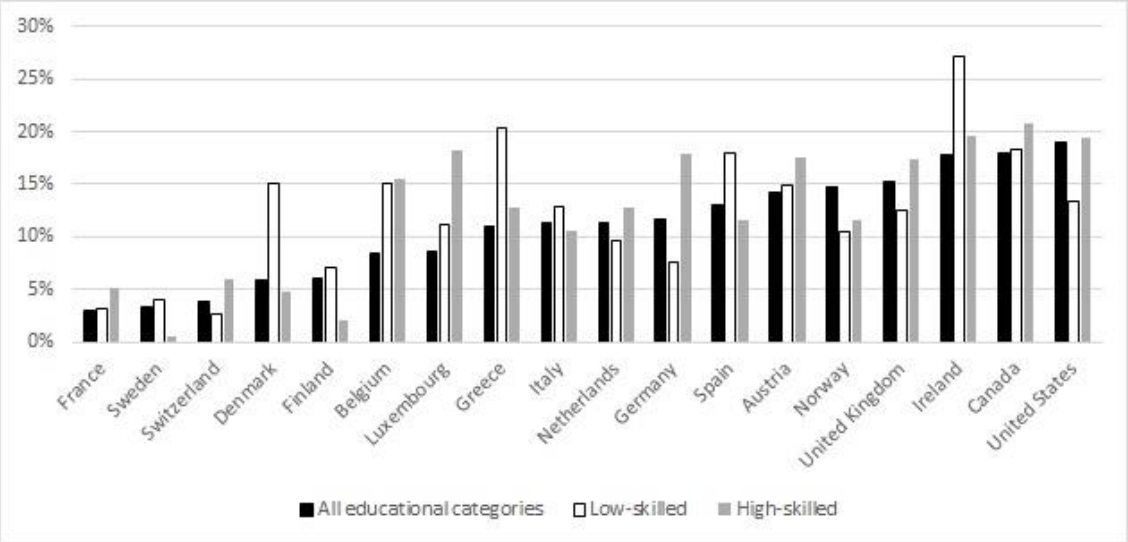
Note: The graph depicts one observation for each country for two periods: the observation closest to 1985 for the first period and one closest to 2000 for the second period. The graph includes observations that were sourced from LIS surveys, except for Denmark, for which the single available observation, sourced from the MTUS dataset, is shown. For both periods, all countries are included for which at least one LIS observation was available for the given period.

4.3 Variation across broad educational categories

Extreme work hours are not distributed equally across broad skills groups. Figure 3 shows the ratio of extreme work in Western economies for three different subgroups: dark shaded bars show the overall ratio across all educational categories; empty bars show the same share among low-skilled workers; while light shaded bars show the same ratio among high-skilled workers. The figure depicts averages over the period between 1990 and 2010, calculated based on all available observations.

As suggested by the graph, extreme work is more prevalent at the low and high ends of the educational scale than in the middle. Apart from the United States (where structural and political changes essentially normalised the long work hours culture in all segments of the labour market during the transition to post-industrialism), and Sweden (where the phenomenon is practically unknown), extreme work is concentrated among low-skilled workers, high-skilled professionals, or both. Countries with a high concentration of extreme work among the low-skilled include Denmark, Greece, Spain, and Ireland. In contrast, extreme work concentrates among the highly educated in Luxembourg, Germany, Austria, and the UK. Finally, in Belgium, both the low- and the high-skilled are much more likely to work extreme hours than those with an intermediate level of skills. Medium-skilled workers, in general, are less likely to work long hours in the Western world than those with low and high qualifications.

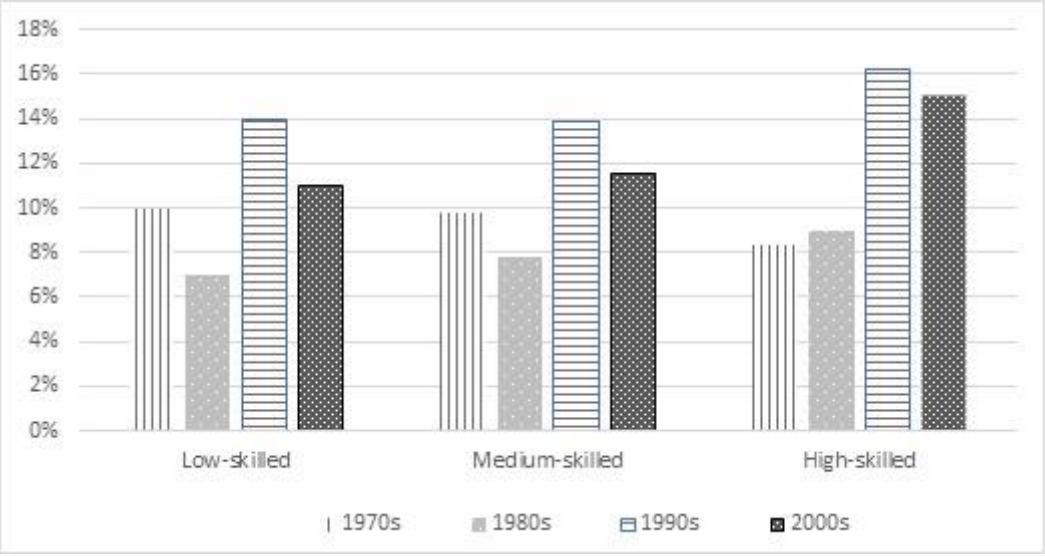
Figure 3: Extreme work across educational categories



Note: The graph depicts averages of the share of workers who work extreme hours for three skills-groups in seventeen Western countries between 1990 and 2010. The averages were calculated based on all available LIS and MTUS observations for the respective skills-group and period.

Figure 4 shows the change over time in the share of extreme workers across educational categories. Since the 1970s, the most radical increase in extreme hours occurred among high-skilled professionals. While in the 1970s this group had the most balanced work time profile, to the 1990s professionals became the most time-deprived strata of the workforce.

Figure 4: Trends over time in extreme work in three educational categories



Note: The graph depicts averages in the share of workers with extreme hours in four decades across three skills-groups in eleven Western countries. Countries with at least one observation from the pre-1990s are included. These are Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Norway, the United Kingdom, Canada, and the United States. The averages were calculated based on all available LIS and MTUS observations for the respective period.

Even though the latest observations in our dataset suggest some decreases between 2004 and 2010 after an increasing trend that lasted a quarter of a century, a number of recently published statistics report that the increasing trend has returned in many Continental European and Anglo-Saxon countries after 2010. An OECD report on well-being (OECD, 2015) finds that the percentage of all employees usually working fifty hours or more per week has doubled in Switzerland and Portugal and moderately increased in Ireland, the United Kingdom, the United States, Greece and Belgium between 2009 and 2013. During the same period, these percentages remained very low in all Scandinavian states and France.

In a similar vein, a recent analysis of the British Trade Union Congress (TUC, 2015) shows that the number of people working more than forty-eight hours a week in the United Kingdom has risen by fifteen percent to nearly three million people between 2010 and 2015. Overall, the increasing trend in long hours that preceded the crises years seem to have resumed in most Western European countries after 2010, with the apparent exception of France and the Scandinavian states.

The systematic concentration of extreme work in groups of countries, skills groups, and time periods suggests that it can neither be sufficiently well explained by workers' individual socio-economic characteristics nor by supply-side theories. On the contrary: workers' decision about the length of their work week seems to be guided by country- and skills-specific institutional constraints.

5. Quantitative evidence

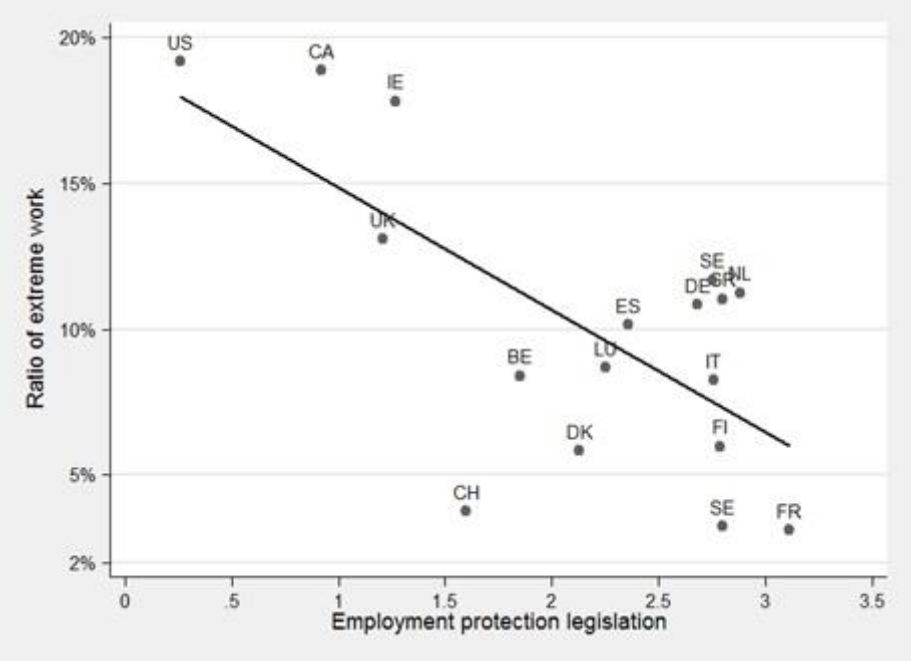
5.1 Macro-correlations

The rise of extreme work in most Continental European countries and the Anglo-Saxon world occurred simultaneously to liberalising trends in labour market policies and industrial relations arrangements

over the past decades. In most Continental European and Anglo-Saxon countries, the stringency of EPL stagnated or weakened, while union density rates and the level of bargaining centralisation decreased.

Above all the institutional factors, cross-national differences in extreme work are driven by differences in the strength of employment protection legislation. As Figure 5 illustrates, there is a strong negative association between the two. Countries with strong EPL exhibit systematically lower levels of extreme work. The figure plots the ratio of extreme work hours (y-axis) against the stringency of EPL on regular contracts, sourced from the OECD (x-axis). Extreme work shares shown in the figure were calculated as averages over the period between 1990 and 2010 for each country.

Figure 5: The association between employment protection legislation and extreme work



Note: For each country, the graph plots the average of all available observations on the ratio of extreme work over the period 1990-2010, against the simple average of the EPL indicator (sourced from OECD) in the given country from the same years.

Bivariate macro-correlations confirm that extreme work ratios are negatively correlated with EPL (r-squared = .54, t-statistic = -3.16). They also indicate that extreme work is negatively correlated with the regulation of work time measured by Fraser Institute's composite indicator (r-squared = .54, t-statistic = -2.97). This composite indicator incorporates nine aspects of the work time regulation for workers in three different labour market positions. In line with our theoretical expectation,

multivariate regression analysis presented in the next Subsection suggests that the association between the composite index of work time regulation and extreme work is partly due to common confounders. The link between work time standards and extreme work diminishes once we control for a range of other political economy factors.

Pairwise macro-correlations between extreme work ratios and indicators of the strength of worker representation within collective bargaining broadly fit expectations. Extreme work ratios have a negative, but weaker, correlation with union density (r-squared = .50, t-statistic = -1.09) or with the extent to which collective bargaining is centralised (r-squared = .51, t-statistic = -1.53). This provides a first indication on the validity of our theoretical argument on unions' lack of capability in fighting for policy measures that target the adverse work time effects of the increasing importance of the 24/7 service economy.

Finally, the size of the public sector is strongly correlated with extreme work (r-squared = .52, t-statistic = -2.77), suggesting that the state has the capacity to shape work time through various direct and indirect channels.

5.2 Regression analysis

A series of pooled cross-section Ordinary Least Squares (OLS) regressions estimate the underlying causal dynamics between the theoretical key institutions, labour market structures, and extreme work.

Variables - key institutions. *1) Employment protection legislation* is measured by the OECD indicator: EPL on regular contracts. *2)* The *Composite index of* u*nion strength* is calculated with equal weights from *Union density*, measured as the net union membership in the proportion of wage and salary earners in employment (sourced from the Amsterdam Institute for Advanced labour Studies' ICTWSS database); *Collective bargaining centralisation* (sourced from Fraser Institute's 2013 Economic Freedom of the World Indicators Report (henceforth, EFW)), and *Collective bargaining coverage* (sourced from ICTWSS). The *3) Size of public sector* is measured by general government consumption as a % of GDP (sourced from EFW). To proxy the *4) Size of the outsider labour market segment,* a

composite index is calculated from i) the share of involuntary part-time workers (OECD), ii) the ratio of temporary employment in total employment (OECD), and iii) the unemployment rate (Armingeon Comparative Political Dataset 2013), with equal weights. Finally, the openness of the economy is measured by *5) FDI inward stock as % of GDP* (UNCTAD).

Controls. To control for the potential effect of broad political ideological, an indicator of Left party strength is included: *Left parties in % of total cabinet posts* (Armingeon Comparative Political Dataset 2013). To control for the possibility that standard stipulations of work time influence extreme work as suggested by the literature on national work time regimes and the simple pairwise correlations, a composite indicator of *Work time regulation*, sourced from EFW, is included.

To control for differences in labour market conditions, *GDP per capita growth*, sourced from OECD statistics, is used. This measure is included to ensure that the effects of institutions are not confounded by the effect of economic cycles. Finally, a *Datasource* dummy is introduced because extreme work hours are systematically higher in surveys that are originally sourced from an MTUS dataset than those sourced from an LIS dataset.

Estimation technique. A series of pooled cross-section OLS regressions are estimated, which use both the longitudinal and cross-section aspects of the data for identification. As the unbalanced panel data set on extreme work hour ratios consists of 104 observations from 18 countries (and 27 country-datasource combinations), it is inappropriate for panel estimation methods. Panel methods with a stronger focus on the longitudinal aspect work best when there are many observations for the same unit, which is not the case in our dataset. Furthermore, the objective of this study in comparing various institutional systems implies that the cross-country aspect should also be in the focus of interest, rather than be blended out. Consequently, the most appropriate estimation method is pooled cross-section estimation with robust standard errors to correct for possible heteroskedasticity.

The nine columns in Table 1 show the regression outputs for three different estimations: the dependent variable in columns (1)-(3) is *Extreme work*: the overall ratio of extreme work hours among

full time employees; in columns (4)-(6), *Low-skilled extreme work*: the ratio of extreme work hours among low-skilled full time workers; and in columns (7)-(9), *High-skilled extreme work*: the ratio of extreme work hours among high-skilled full time workers in a given country in a given year.

In sum, the general form of the estimators is as follows:

$$Extreme\ work_{it} = \sum\beta_a Key\ institutions_{it} + \sum\beta_b Controls + \beta_c Datasource\ dummy_{it} + \mu_{it.;} \quad (1)\text{-}(3)$$

$$Low\text{-}skilled\ extreme\ work_{it} = \sum\beta_a Key\ institutions_{it} + \sum\beta_b Controls + \beta_c Datasource\ dummy_{it} + \mu_{it.;} \quad (4)\text{-}(6)$$

$$High\text{-}skilled\ extreme\ work_{it} = \sum\beta_a Key\ institutions_{it} + \sum\beta_b Controls + \beta_c Datasource\ dummy_{it} + \mu_{it.;} \quad (7)\text{-}(9);$$

where the βs are parameter estimates for the main independent, control, and datasource dummy variables. The subscripts *i* and *t* represent the country and year of the observations, respectively.

For each of the three dependent variables, three specifications are reported. The first ones, columns (1), (4), and (7), include all main explanatory and control variables. The second specifications, columns (2), (5), and (8), include all explanatory and control variables, with one change to the previous specification: *Union density* is plugged in instead of the composite index of *Union strength*. In the third specifications, columns (3), (6), and (9) the significant variables from the previous specifications are included.

Results*.* The results reported in Table 1 provide strong quantitative support for our argument on the coercive effect of macro-institutions on extreme work. One stand-alone policy institution, *Employment protection legislation,* and the general measure of state capacity, the *Size of public sector,* have strong and significant reducing effects on very long hours across all specifications. These results support our arguments on the prominent role of EPL and, more generally, the capacity of the state, in hindering the spreading of the long work hours culture.

Union strength has ambiguous effects on extreme work: neither the composite index of *Union strength* nor *Union density* has a significant effect in the expected direction. Moreover, they have a positive effect in the specifications in columns (4) through (6), implying that union strength might even increase

the proportion of very long hours among the low-skilled. This result is in line with earlier evidence on the offsetting work time effect of unions (Blanchflower, 1996; Burgoon and Baxandall, 2004), and provides another layer of evidence for theories on the hollowing out of the formal institutional arrangements in collective bargaining in Western Europe (Streeck and Thelen, 2005; Thelen, 2014). The apparent stability in union density and bargaining centralisation in some countries might indeed mask the erosion of unions' coordinating capacities in representing the interests of workers from all sectors and strata of the labour market.

Finally, the hypothesis on the effect of political inaction in the face of new market structures is overwhelmingly supported by the results, presented in Table 1. The *Size of the outsider labour market segment* has a statistically significant positive effect in columns (2), (4), (5), and (6), implying that dualism indeed increases the proportion of very long hours, especially among the low-skilled. Both the magnitude and the significance of the effect are more stable in columns (4) through (6), which suggests that the causal relationship is most pronounced among the low-skilled. In countries, where a sizeable proportion of the workforce falls in the outsider category, very long hours among the low-skilled are significantly more prevalent. This is due to their vulnerable labour market position. Low-skilled outsiders are rarely able to reject undesired overtime requests from their superiors.

The impact of economic openness, measured as *FDI inward stock as % of GDP,* is positive and significant in columns (7) through (9) whereas it is insignificant in the first six columns. This suggests that economic globalisation indeed has a significant increasing effect on the ratio of extreme work among the highly educated but not among those with lower skills. Economic openness indeed introduces a new layer of competition among professionals on several occupational labour markets.

The notion that the effects of the two structural changes are discernible even after controlling for all theoretically relevant policy institutions implies that existing policy institutions do not provide adequate counterweight to the adverse work time effect of changing labour market structures.

The results related to the theoretically important control variables broadly fit expectations inasmuch as most coefficients have the expected signs and their influence is not statistically significant. The explanatory power of left partisanship, *Left parties in % of total cabinet posts*, is largely taken away by the concrete policy institutions, implying that much of the influence that broad ideological setups exert can be captured by direct policy instruments. *Work time regulation* has a negative but insignificant effect in all specifications, suggesting that differences in the regulated or collectively agreed standards for work hours and paid vacation days do not have a significant effect on whether people work more than fifty hours per week.

Table 1: Institutional drivers of extreme work hours

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Extreme work	Extreme work	Extreme work	Low-skilled extreme work	Low-skilled extreme work	Low-skilled extreme work	High-skilled extreme work	High-skilled extreme work	High-skilled extreme work
Employment protection on regular contracts	-1.850**	-1.187*	-1.651***	-2.980**	-1.374	-1.769**	-2.276*	-1.578*	-1.598**
	(0.855)	(0.625)	(0.609)	(1.286)	(0.831)	(0.871)	(1.168)	(0.867)	(0.777)
Composite index of union strength	0.565			1.409*			0.564		
	(0.636)			(0.789)			(0.731)		
Union density		0.031			0.110**	0.105**		-0.001	
		(0.039)			(0.048)	(0.048)		(0.044)	
Size of public sector	-0.408***	-0.406***	-0.265**	-0.512***	-0.522***	-0.474***	-0.360**	-0.337**	-0.429***
	(0.140)	(0.145)	(0.118)	(0.176)	(0.183)	(0.154)	(0.159)	(0.166)	(0.153)
Size of the outsider labour market segment	0.440	0.701*		0.870**	1.047**	0.777*	0.308	0.583	
	(0.365)	(0.418)		(0.420)	(0.497)	(0.432)	(0.393)	(0.449)	
FDI inward stock as % of GDP	0.021	0.033		0.016	0.028		0.027*	0.040*	0.039***
	(0.016)	(0.025)		(0.017)	(0.031)		(0.015)	(0.022)	(0.015)
Left parties in % of total cabinet posts	-0.002	-0.005		0.023	0.015		0.014	0.016	
	(0.015)	(0.016)		(0.019)	(0.021)		(0.018)	(0.020)	
Work time regulation	-0.583	-0.746		-0.438	-0.527		-0.446	-0.508	
	(0.477)	(0.459)		(0.497)	(0.514)		(0.462)	(0.452)	
GDP per capita growth (annual %)	-0.145	-0.232		0.131	0.125		0.333	0.180	
	(0.359)	(0.406)		(0.429)	(0.471)		(0.336)	(0.377)	
Datasource dummy	14.038***	13.692***	13.577***	5.495***	5.473***	5.189***	7.994***	7.476***	7.949***
	(1.749)	(1.578)	(1.739)	(1.747)	(1.639)	(1.650)	(1.781)	(1.662)	(1.710)
Constant	4.415	5.421	2.682	14.204***	14.463***	14.469***	12.132***	13.291***	14.747***
	(3.797)	(4.059)	(3.509)	(4.548)	(4.806)	(4.336)	(4.163)	(4.414)	(3.848)
Observations	100	95	104	95	90	94	95	90	99
R-squared	0.604	0.618	0.562	0.209	0.231	0.182	0.347	0.356	0.323
Robust standard errors in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									

6. Conclusion

This article provides an empirical and a theoretical contribution to comparative work time scholarship. Empirically, it provides a comprehensive analysis of extreme work hours in Western Europe and North America. Theoretically, it presents an institutionalist perspective against supply-side, or neoclassical, approaches to the analysis of long work time patterns in post-industrial labour markets.

The supply-side position explains the existence of extreme work by individuals' preferences. It suggests that workers freely opt to work long hours to reach their financial and social goals, or to find shelter from their problem-loaded (dual earner) households. In contrast to supply-side approaches, this article demonstrates that the choice whether to work more than fifty hours per week is not entirely, or even mainly, left to the preference of individuals but is guided by collective institutions. Individual choices are constrained by labour market policies, collective bargaining institutions, and changes in labour market structures that the state fails to act upon.

As the most important policy institution, employment protection legislation contributes to the formation and maintenance of an organisational culture in which it is relatively difficult for employers to pressure people into working late. Beyond setting labour market policies, the state influences work time patterns through various indirect channels. In general, a large and capable public sector can shore up a state's capacity in implementing policies that target adverse distributional patterns, including that of the proliferation of the long work hours culture.

The proportion of extreme work is further influenced by political drifts which result from political inactivity in the face of new economic structures. One such structural change is the widening division of labour markets into an insider and an outsider segment. The other is the employment growth in non-shielded high-end service sectors. Both changes contribute to the emergence of new labour market vulnerabilities and worsening conditions of work (including longer hours).

Beyond providing an important contribution to comparative work time scholarship, this article has implications on three ongoing debates in comparative political economy. First, the finding about the ambiguous effect of unions on work hours provides new impetus into the debate on unions' capabilities to represent workers in an inclusive manner in post-industrial economies. The notion that unions are incapable to fight the proliferation of the long work hours culture in several Western European countries introduces a new angle in the discussion on the hollowing out of the formal institutional arrangements in collective bargaining (Baccaro and Howell, 2011; Streeck and Thelen, 2005; Thelen, 2014).

Second, the result relating to the cross-cutting effect of the political economy environment and education on the share of extreme work has implications on the study of the new labour market divide between outsiders and insiders. Labour market vulnerability has been widely equated in the literature with the precarious position of low-skilled, low-wage labour (King and Rueda, 2008; Tomlinson and Walker, 2012; Emmenegger et al., 2012). It is only in most recent studies that the emergence of labour market vulnerability among the highly educated is recognised (Häusermann et al., 2015). The notion that very long work hours have become most prevalent among the high-skilled population indicates that vulnerability is very much present at the higher strata of the labour market.

As this article suggests, it is precisely the highly educated part of the workforce that is most pressured in terms of work time by the additional layer of competition introduced by economic globalisation. Economic globalisation, with the frequent reorganisation of global value chains and the internationalisation of professional labour markets, has reshaped professional labour markets in an unprecedented way. Fierce competition, insecurity about medium term employment prospects, along with the increasing use of regulatory exemptions, boost a race-to-the-bottom type of competition in professional labour markets. This manifests itself, among others, in an increasing precedence of extreme work hours.

The effect of changing labour markets structures at the bottom and the top of the skills scale is partially counterbalanced by policy institutions, such as employment protection legislation, but overall there is more room for targeted policy measures.

Third, from a broader perspective, the study of extreme hours might provide a new impetus in the debate on European political economies' convergence toward the US-American pattern (Baccaro and Howell, 2011) or their divergence along distinct varieties of capitalism (Hall and Soskice, 2001). Extreme work might be an instrument that sheds light on some of the undiscovered converging tendencies in the labour markets of Continental Europe that no other indicator, e.g. income inequality or temporary work, can properly capture.

Though the paper presents a multifaceted political economy analysis of extreme work, not every aspect of the institutional palette could be directly considered. Further research could complement this study by concentrating on other institutional factors, including those incorporating the core of the gendered work time regime approach (e.g. Rubery et al., 1998). These, mostly welfare-based or social policy related, factors could include the quality and availability of childcare facilities, access to parental leave schemes, social norms and policies that incentivise men and women to distribute family care responsibilities equally. Perhaps a more suitable level of analysis for such an inquiry would be at the micro-, firm-, or multi-level.

Furthermore, it is an inherent shortcoming of quantitative comparative studies that they do not provide abundant qualitative and conceptual discussion around country cases. Therefore, to reveal the role of country-specific institutional developments in shaping extreme work, a qualitative historical analysis of institutional reforms would be needed. This could be a fertile new terrain for future research.

Finally, a comparative analysis of the cross-reinforcing incentives incorporated in the tax and social security system could provide fresh insights into the topic. Jacobs and Gerson (2004) show that the US-American regulatory environment induces labour practices that trigger the growing bifurcation of

work into overwork and underwork through creating a legal environment in which it is the most cost-effective strategy for employers to pay the overtime hours of full-time workers while employing a large part of the workforce in atypical forms (e.g. part-time or project-based employment), as the latter do not require employers to pay social security contributions. Hiring workers on a full-time basis and not pressuring them into overwork is the most 'expensive' form of employment in the US-American regulatory environment. Whether similar incentives are present in the tax and social contributions system of other Western political economies could be revealed by a series of qualitative country case studies.

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Appendix – Data sources

Armingeon Comparative Political Dataset 2013: http://www.cpds-data.org/

Fraser Institute's 2013 Economic Freedom of the World Indicators Report (EFW): https://www.fraserinstitute.org/research/economic-freedom-of-the-world-2013-annual-report

ICTWSS database of the Amsterdam Institute for Advanced labour Studies: http://www.uva-aias.net/en/ictwss

Multinational Time Use Study: https://www.timeuse.org/mtus

Luxembourg Income Study Database: http://www.lisdatacenter.org/our-data/lis-database/

OECD statistics: http://stats.oecd.org/

United Nations Conference on Trade and Development (UNCTAD): http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en

Chapter III. Extreme working hours standardized meta-database: Methodology of data compilation

This chapter provides a detailed analysis of the standardization process by which a meta-database of extreme work hours has been compiled. Following earlier literature, extreme work hours – or extreme jobs - are operationalized as employees' weekly work hours of 50 or more. To produce the standardized macro-level meta-database, the share of extreme working hours has been computed from 104 nationally representative micro-level surveys for twenty-four socio-economic subgroups. The meta-database allows researchers to gain a macro-level understanding of certain aspects of time allocation, in particular, to uncover longitudinal and cross-country patterns of long work hours in sixteen advanced economies in Western Europe and North America between 1970 and 2010. This is the first empirical project that provides a scientific baseline for researchers to conduct cross-country as well as longitudinal inquiries into the trends of extreme jobs in the advanced West. While the higher end of the US-American work time distribution has already received some research attention, European patterns of extreme work hours have not yet been analyzed in a comprehensively comparative manner in scholarly work.

1. Introduction

In 1991, Juliet Schor published *The Overworked American*, in which she showed evidence that US-Americans were spending significantly more time at paid work in the late 1980s than they had been in the late 1960s. According to her estimations, on average, women worked 300 hours more in 1987 than in 1969 while men worked almost 100 hours more. Schor's revelation was surprising and at the same time disappointing as it suggested that the fruits of technological advancements were not used in a labor friendly way in a generally increasing economic productivity environment. Her findings triggered a still ongoing debate on whether and why this trend is happening. Although subsequent research (e.g. Coleman and Pencavel 1993a,b; Jacobs and Gerson 1998; Robinson and Bostrum 1994) questioned the accuracy of Schor's estimates, and showed that her results are not invariant to the data used in the investigation (Sundstrom 1999), most research documents an overall increasing trend in average work hours in the United States since the 1970s (Clarkberg and Moen 2001; Coleman and Pencavel 1993a,b; Hochschild 1997; Leete and Schor 1994).

The prevalence of long work hours across various groups of the US-American population has also been examined in the past. For example, Clarkberg and Moen (2001) finds an above-average increase among individuals in dual-earner households between 1972 and 1996. Bertrand, Goldin, and Katz (2010) and

Hewlett and Luce (2006) argue that excessively long work hours have become so prevalent in the corporate and financial sectors that in the years following graduation, highly skilled women gradually leave high-powered positions to settle for other occupations where they can combine family and career responsibilities. Bertrand et al. (2010) argues that the gender gap in the corporate sector might be much lower if firms stopped insisting on employees working extreme hours. A few macro-level analyses (e.g. Jacobs and Gerson 2004) examine whether the increasing pattern of extreme hours is limited to some industries or it has become a general trend in the US economy. The empirical analysis of Jacobs and Gerson (2004) reveals a new general trend of bifurcation in work time: the share of very long and very short work weeks have indeed increased at the macro level. They show that the percentage of US-American women and men who are 'overworked' or 'underworked' has significantly grown since the 1980s. Furthermore, the prevalence of extreme work hours has particularly increased among employees with college degrees. According to their estimates, 39% of US-American men and 20% of US-American women with college degrees worked more than 50 hours a week in 2000.

Trends in extreme work hours in European countries have received much less focus to-date in scholarly work. Most of the comparative work time literature on Europe (e.g. Alesina et al. 2005; Ausubel and Grübler 1995; Golden and Figart 2005) focuses on country-level average work hours which have stagnated or declined over the last decades. As declining or stagnating averages seem to have confirmed the theoretical arguments of the national work time regime literature in terms of the variety in work-life balance patterns, researchers have turned little attention to the analysis of the high-end of work time distributions. The compilation of the standardized meta-database of extreme work hours is a first step towards filling this gap in the literature as it provides an empirical basis for macro-level analysis of changing work profiles in Western Europe and North America. The meta-database will allow researchers to uncover macro-level trends in long work hours in sixteen advanced capitalist countries between 1970 and 2010 in a longitudinal and cross-sectional comparative manner. The aim of this project has been to arrive at a well-coordinated empirical approach to the understanding of certain less researched aspects of time allocation, starting out from a micro-sequential level of individuals' everyday life and building it up progressively to a macro-level meta-database so that a macro level understanding of social change could be captured.

The rest of the paper proceeds as follows. The next section gives a detailed description of the data sources used for the standardization process. This is followed by a methodology section which takes account of the potential measurement problems and shows how these have been avoided throughout the standardization process. The next section gives some illustrations to the uses and technicalities of the meta-database while the final section gives a short conclusion.

2. Data sources

The standardized meta-database of extreme work hours has been compiled directly from two large micro data collections: the Luxembourg Income Study Database (LIS) and the Multinational Time Use Study (MTUS). Both databases contain a large number of harmonized surveys collected from multiple countries over a period of four decades, starting as early as from the 1970s.

The Luxembourg Income Study Database is the largest available income database of harmonized microdata which has lately become a widely used data source in income inequality research (e.g. Andersen 2012; Atkinson, Piketty, and Saez 2012; Forster and Vleminckx 2004; Mahler and Jesuit 2006; Pontusson and Rueda 2008). Along with a range of variables on market income, public transfers and taxes, household- and personal-level characteristics, most of the LIS data sets contain labor market variables, such as employment status and weekly work hours. The LIS was first conducted in 1968 in three countries. In 2010, the database included data from forty-five countries on four continents. From the 1980s until 2000, LIS surveys were organized into waves corresponding to five-year intervals. Since 2000, the survey was conducted more frequently: the sixth wave in 2004, the seventh in 2007, and the eighth in 2010.

The Multinational Time Use Study is the largest harmonized collection of time use diaries, from more than twenty-three countries, covering more than four decades from the early 1960s to present. The original MTUS allowed the comparison of British time use data with the 1965 Szalai Multinational Time Budget Study and data from Canada and Denmark. Since then the MTUS has grown to offer harmonized episode and context information and encompasses over sixty datasets from twenty-three countries, including recent data from the HETUS (Harmonized European Time Use Survey), ATUS (American Time Use Survey), and other national-level time use projects.

The MTUS center collects and harmonizes nationally representative time use diaries that were originally conducted by the participant country's national statistical offices. The LIS center collects and harmonizes an entire range of different microdata sets that were originally provided by research centers and statistical offices of the participating countries (e.g. household panel surveys, socio-economic panel surveys, income distribution surveys, income and wealth surveys, waves of EU-SILC (EU - Survey on Income and Living Conditions), current population surveys, family expenditure surveys, family budget surveys, etc.). For an exact and complete list of the original surveys that were harmonized by the MTUS and LIS centers and then used as a source in the standardization process of the meta-database, along with the name of each original survey data provider institution, please see the Appendix.

Because of the harmonization processes implemented by the MTUS and LIS teams, all variables in the MTUS and LIS databases are standardized both in terms of conceptual content and in terms of coding. Standardization in terms of conceptual content implies that the concept and definition of variables are comparable across all datasets. Standardization in terms of coding implies that continuous standardized variables report information expressed in the same unit across different datasets (e.g. hours variables report number of hours worked per week, age variables report number of years), and categorical standardized variables report information expressed with the same value codes and labels.

Harmonized microdata from the LIS and MTUS centers are available to registered users world-wide. While the MTUS microdata can be downloaded directly from the center's homepage, LIS does not provide direct access to its microdata collection. Instead, it operates a remote-execution data access system (LISSY) through which users can submit programs using common statistical software packages. The execution of the programs is done by the LIS team and outputs are returned to users through the interface as well as per email. The execution of the programs usually does not take more than thirty seconds therefore researchers can work efficiently without major interruptions with LIS data even though they do not have direct access to the microdata sets.

MTUS and LIS data are not suitable for individual-level panel analysis but they are suitable for repeated cross-section analysis as respondents cannot be linked over time and different country-year surveys come from different years.

3. The standardization processes

To produce the meta-database of extreme working hours, the share of employees with extreme work hours has been computed from 104 nationally representative surveys for twenty-four socio-economic subgroups in a standardized way. The standardization process resulted in a meta-database that contains the following list of standardized macro-level indicators (with 104 cases each) on the prevalence of extreme jobs in advanced Western economies (extreme work hours are operationalized as weekly working hours of 50 or more):

Ratio of employees with extreme work hours among

1) *all employed persons;*
2) *all male employees;*
3) *all female employees;*
4) *all employees with low educational attainment;*
5) *all employees with medium educational attainment;*
6) *all employees with high educational attainment;*

7) *all male employees with low educational attainment;*
8) *all male employees with medium educational attainment;*
9) *all male employees with high educational attainment;*
10) *all female employees with low educational attainment;*
11) *all female employees with medium educational attainment;*
12) *all female employees with high educational attainment;*
13) *full time employees;*
14) *full time male employees;*
15) *full time female employees;*
16) *full time employees with low educational attainment;*
17) *full time employees with medium educational attainment;*
18) *full time employees with high educational attainment;*
19) *full time male employees with low educational attainment;*
20) *full time male employees with medium educational attainment;*
21) *full time male employees with high educational attainment;*
22) *full time female employees with low educational attainment;*
23) *full time female employees with low educational attainment;*
24) *full time female employees with low educational attainment in the given country*.

For each survey in the harmonized LIS and MTUS database in which individual respondents' age, gender, 3-category highest educational level indicator, employment status, and weekly work hours were reported, country-level ratios of extreme work hours were calculated for each of the above listed socio-economic subcategories from the nationally representative population samples. Surveys from any of the two harmonized databases that do not contain one or more of the above listed variables were left out from the standardized meta-database.

The following paragraph addresses potential measurement problems related to the above listed variables, as defined in the LIS and MTUS data set manuals.

The first variable where harmonization of micro-datasets could, in theory, invoke measurement problems is the variable on individuals' highest educational attainment. Luckily a 3-category highest educational attainment variable – *educ* in LIS surveys and *edcat* in MTUS surveys – was found in both harmonized databases with the exact same definitions. Both are recoded variables whose harmonization was executed by the LIS and MTUS teams from the original country-specific variables on respondents' highest educational level. Although the original country specific formats vary to a large extent, the definition of the 3-category highest educational attainment variable is based on the

Standard Classification of Education from UNESCO, ISCED97 in both harmonized databases. In both the LIS and MTUS data sets, the category 'low' stands for less than secondary education completed (no completed education or education completed at the ISCED levels 0, 1 or 2), category 'medium' stands for secondary education completed (completed ISCED levels 3 or 4), and category 'high' stands for at least one year of completed tertiary education (ISCED levels 5 or 6).

Employment status is another variable where potential measurement problems must be addressed. LIS contains a simple 2-category variable – *emp* - which reports whether a respondent has self-declared herself to be employed or not employed. Though MTUS does not contain the same 2-category variable on employment status but it does contain a 4-category variable – *empstat* with self-declared 'full-time', 'part-time', 'employed and work hours unknown', and 'not employed' categories - which can easily be recoded into the exact same two categories that are defined in LIS' *emp* variable. By recoding the first three categories of *empstat* into a new 'employed' category, the new 2-category variable in MTUS will fully overlap with the 2-category variable on employment status in LIS. This way, the same pool of respondents can be selected when one of the two categories of employment status are used in either of the surveys from the two harmonized databases.

Finally, an important note on the definition of our variable on weekly work hours. For the standardized meta-database of extreme hours, the *hours* variable was used from the LIS database and the *workhrs* variable from the MTUS simple database. Even though the two variables do not report answers to the exact same questions, the standardization of the two databases still gives the best meaningful large-scale comparative source on the patterns of employees' work hours for the reasons that will be discussed in the following two paragraphs.

Hours in the LIS database records respondents' regular hours worked at all jobs currently held including any overtime whereas w*orkhrs* in the MTUS database records respondents' work hours at all jobs from last week including any overtime. Creating indicators of extreme work hours using either of the two variables ('usual weekly work hours' or 'work hours from last week') can be regarded as an extension to the harmonization of the work hour data from the individual surveys as done by the MTUS team. During the harmonization work executed on the original surveys (see Appendix for the full list), the MTUS team gave priority to the number of hours paid work during 'last week' even if data on the number of hours 'usually worked' was available (which was the case only in some surveys). However, if data on the number of paid work hours last week was not available, then *workhrs* was computed by using 'usual hours' of paid work. Furthermore, when neither question was available, seven-day diaries or work schedules were used to measure hours worked during the diary week. Consequently, the harmonized *workhrs* variable in the MTUS data sets already uses a combination of answers to two

different time-estimate questions and, in some cases, of an additional time-diary figure to create the harmonized *workhrs* variable on weekly work hours.[3]

It is worth noting that the extreme hour estimates in the meta-database that are sourced from the MTUS data sets are systematically higher or equal than the equivalent ones from the LIS data sets. The higher or equal estimates of extreme weekly work hours from the MTUS surveys are probably driven by two mechanisms. First, when respondents are asked about their work hours from last week, the distribution of the responses is likely to be more dispersed than when respondents are asked about their usual (average) work hours. As the extreme hour research concentrates on the higher end of this distribution, the estimates of our interest will be affected by this statistical curiosity. Second, a psychological mechanism might also play a role. It is possible that respondents with long work hours are likely to report their work hours more accurately when they are asked in detail about their recent schedule, which is the case in time use diaries. The reason for that might be that self-delusion into a more balanced work-life schedule than it is evident in reality has less space in this case. Now, regardless of the extent to which these mechanisms might or might not play a role in slightly higher estimates of extreme work hours in the MTUS surveys, researchers using the meta-database should keep this delicate difference in outcomes in mind and should control for the survey source (LIS or MTUS). It is worth noting that this statistical curiosity of the meta-database does not distort longitudinal trends or cross-sectional within country trends in any way.

Finally, the share of extreme work hours has been calculated in two different ways. These differ as to the basic sample population to which the number of extreme workers was compared. Most of the literature (e.g. Jacobs and Gerson 1998, 2004; Krings, Nierling, Pedaci, and Piersanti 2005) analyses ratios of long work hours within the pool of workers who report to have worked at least one hour in the previous month. This methodology is appropriate for cross-sectional comparison of cross-country and within country differences. However, it is less adequate for the analysis of longitudinal trends as structural changes in women's labor supply since the 1970s have radically broadened the pool of employed persons (the pool of workers with at least one work hour). Therefore, after calculating the

[3] A group of scholars would probably challenge the measurement accuracy of the harmonization of reported weekly working hours data with time-diary figures, as it had been done by the MTUS team in the process of building MTUS' harmonized *workhrs* variable. Glorieux et al. (2011) and Gershuny and Robinson (1994) argue that survey answers to time-estimate questions on weekly working hours are systematically higher than working hour figures in time-diaries. Jacobs (1998), on the other hand, argues that the observed discrepancies between time-estimates and diary figures simply result from the „regression to the mean" phenomenon. The approach of the author of this paper is to accept the harmonization guidelines of the MTUS team but at the same time acknowledge the possibility that some MTUS surveys might report slightly lower working hour figures than the others, as these were sourced from time-diary figures. As the meta-database contains a large number of observations calculated from various types of surveys, a small number of these lower estimates will not distort long-term trends.

first dozen indicators of extreme work hours over the pool of workers, aged between 23 and 62, with at least one hour of reported work in the previous month, the calculation of the indicators was repeated using a different pool of respondents: the pool of full time employees (operationalized as employed persons with a minimum of 30 work hours per week, in line with LIS and MTUS survey methodology standards, aged between 23 and 62). This supplement allows researchers to conduct longitudinal analyses on the prevalence of extreme jobs since the 1970s. Focusing on the ratios of long work hours among full time employees will allow researchers to move beyond cross-sectional comparative analysis into determining whether there are discernible time trends in the prevalence of extreme hours.

4. Illustrations to the uses and technicalities of the meta-database

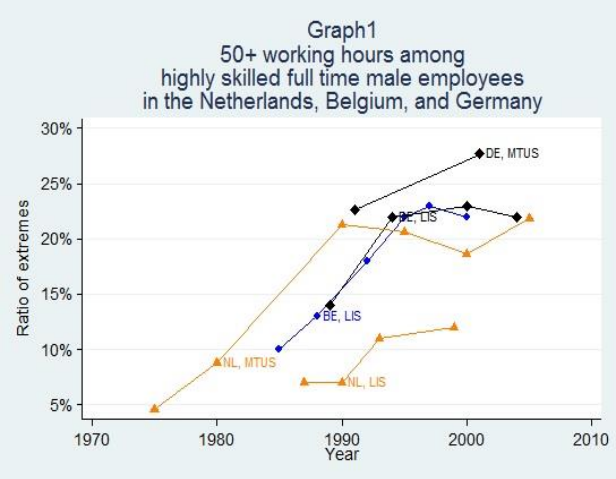
This section gives some illustrations to the uses and technicalities of the meta-database. Graph1 illustrates longitudinal trends in extreme work hours among full time male employees in three European countries, the Netherlands, Belgium, and Germany. It is apparent from the graph that the ratio of extreme workers among full time male employees has increased in all three countries since the 1970s. While in the 1970s and the first half of the 1980s, the ratio of full time male extreme workers was below 10-15% in all three countries, as indicated by observations originally sourced both from LIS and MTUS surveys, from the end of the 1980s onwards, this ratio seems to have gradually increased to above 20% in all three countries. The only observations that show a below 20% ratio for the years after 1990 stem from the LIS-Netherlands surveys. These, however, also detect an increasing time trend, albeit with consistently lower levels as compared to the levels of the equivalent MTUS observations.

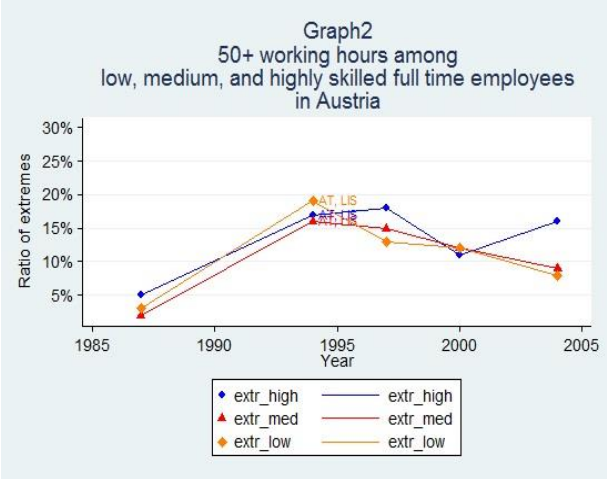
Graph2 illustrates that the meta-database is suitable for the analysis of within country longitudinal trends. The three lines in the graph show trends in extreme work hours separately for three different socio-economic groups within the Austrian society: low skilled full time employees, medium skilled full time employees, and highly skilled full time employees. While we see a clear increase in the proportion of extreme work in all three socio-economic groups in the decade after 1988, it seems that a structural break could have occurred in the first years of the millennium: whereas the ratio of extreme work started to slowly decline among medium and low skilled employees, the data capture a radical bounce back in the proportion of extreme work to an above 15% level among high-skilled employees in the years after 2000.

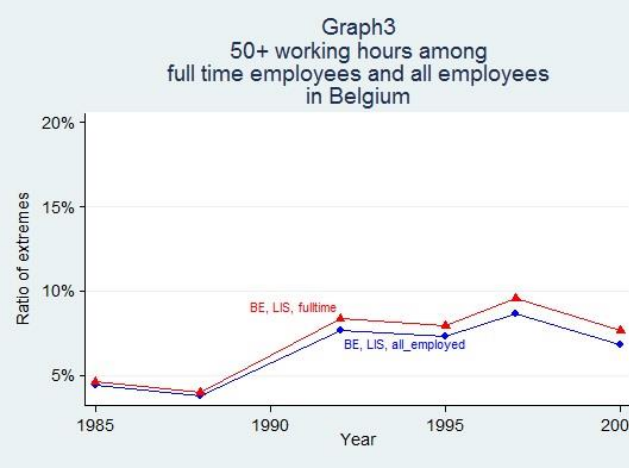
Graph3 illustrates an important technical aspect of the meta-database: the indicators using the pool of full time employees as basic sample population to which the number of extreme workers are compared capture longitudinal trends much more consistently than the equivalent indicators using the

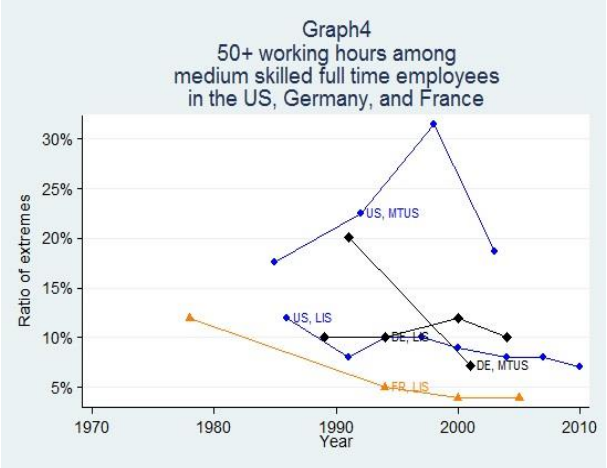
pool of employees who have reported at least one hour of work in the previous month. The reason for this difference is probably due to the radical increase in women' labor supply that occurred since the 1970s. The gradual increase in women's labor supply over the course of the following decades has broadened the pool of employees who have reported at least one hour of work (i.e., the denominator used for the calculation of 'BE, LIS, all_employed' in Graph3) but has not radically changed the size of the pool of full time employees (i.e., the denominator used for the calculation of 'BE, LIS, fulltime'). As it can be seen on the graph, modest increases of extreme hours can be detected in a more pronounced manner when we use the 'full time' indicator instead of the 'all employed' indicator. While for 1985, the two indicators show the same level of extremes, 'BE, LIS, fulltime' exhibits a higher increase over time than 'BE, LIS, all_employed'. For these reasons, the author of this paper argues that longitudinal patterns can be more apparently and consistently detected when the researcher analyses trends in extreme hours among the pool of full time employees.

Finally, Graph4 gives a first blink into the longitudinal trends in extreme work hours among medium skilled full time employees in three other countries, the United States, Germany, and France. The data on medium skilled employees seem to detect a general stagnating or decreasing longitudinal pattern in all three countries.









5. Conclusion

The analysis of European patterns of extreme work hours at the macro level has received much little research attention in scholarly work to-date. This paper provides a detailed analysis of the standardization process by which the first large-scale meta-database of extreme work hours has been compiled. The meta-database contains twenty-four county-level indicators of the proportion of extreme work hours with 104 observations for each twenty-four socio-economic subgroups. The country-level proportions of extreme hours were calculated from nationally representative micro-level surveys sourced from the LIS and MTUS harmonized databases.

The meta-database of extreme work hours allows researchers to gain a macro-level understanding of certain changes in Western European and North American work profiles in a comparative manner. Researchers using the meta-database can uncover cross-country and within country longitudinal as well as cross-sectional patterns of extreme work hours in sixteen advanced capitalist countries between 1970 and 2010. This is the first empirical project that provides a standardized empirical baseline for researchers to conduct macro-level longitudinal inquiries into the trends of extreme jobs in the advanced West.

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Appendix – Data sources

Country	Survey	Harmonized data set	Original survey	Data provider of original survey
Austria	1987	LIS	Austrian Microcensus	Statistics Austria
Austria	1994	LIS	European Household Panel / AT ECHP	Interdisciplinary Center for Comparative Research in the Social Sciences (ICCR)
Austria	1997	LIS	European Household Panel / AT ECHP	Interdisciplinary Center for Comparative Research in the Social Sciences (ICCR)
Austria	2000	LIS	European Household Panel / AT ECHP	Interdisciplinary Center for Comparative Research in the Social Sciences (ICCR)
Austria	2004	LIS	Survey on Income and Living Conditions EU-SILC 2005 survey	Statistics Austria
Belgium	1985	LIS	Socio-Economic Panel (SEP)	University of Antwerp
Belgium	1988	LIS	Socio-Economic Panel (SEP)	University of Antwerp
Belgium	1992	LIS	Socio-Economic Panel (SEP)	University of Antwerp
Belgium	1995	LIS	Panel Study of Belgian Households (PSBH) / BE ECHP	University of Antwerp
Belgium	1997	LIS	Socio-Economic Panel (SEP)	University of Antwerp
Belgium	2000	LIS	Panel Study of Belgian Households (PSBH) / BE ECHP	University of Antwerp
Canada	1975	LIS	Survey of Consumer Finances (SCF)	Statistics Canada
Canada	1987	LIS	Survey of Consumer Finances (SCF)	Statistics Canada
Canada	1991	LIS	Survey of Consumer Finances (SCF)	Statistics Canada
Finnland	1991	LIS	Income Distribution Survey (IDS)	Statistics Finland
France	1978	LIS	Family Budget Survey (BdF)	National Institute of Statistics and Economic Studies (INSEE)
France	1994	LIS	Family Budget Survey (BdF)	National Institute of Statistics and Economic Studies (INSEE)
France	2000	LIS	Family Budget Survey (BdF)	National Institute of Statistics and Economic Studies (INSEE)
France	2005	LIS	Family Budget Survey (BdF)	National Institute of Statistics and Economic Studies (INSEE)
Germany	1989	LIS	German Social Economic Panel Study (GSOEP)	DIW Berlin
Germany	1994	LIS	German Social Economic Panel Study (GSOEP)	DIW Berlin
Germany	2000	LIS	German Social Economic Panel Study (GSOEP)	DIW Berlin
Germany	2004	LIS	German Social Economic Panel Study (GSOEP)	DIW Berlin
Greece	1995	LIS	Household Income and Living Conditions Survey/ GR ECHP	Hellenic Statistical Authority (ELSTAT)
Greece	2000	LIS	Household Income and Living Conditions Survey/ GR ECHP	Hellenic Statistical Authority (ELSTAT)
Greece	2004	LIS	Survey on Income and Living Conditions / EU-SILC 2005 survey	Hellenic Statistical Authority (ELSTAT)
Greece	2007	LIS	Survey on Income and Living Conditions / EU-SILC 2008 survey	Hellenic Statistical Authority (ELSTAT)

Greece	2010	LIS	Survey on Income and Living Conditions / EU-SILC 2011 survey	Hellenic Statistical Authority (ELSTAT)
Ireland	1994	LIS	Living in Ireland Survey / IE ECHP	The Economic and Social Research Institute
Ireland	1995	LIS	Living in Ireland Survey / IE ECHP	The Economic and Social Research Institute
Ireland	1996	LIS	Living in Ireland Survey / IE ECHP	The Economic and Social Research Institute
Ireland	2010	LIS	Survey on Income and Living Conditions / EU-SILC	Central Statistics Office Ireland
Italy	1987	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	1989	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	1991	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	1993	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	1995	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	1998	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	2000	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	2008	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Italy	2010	LIS	Survey on Household Income and Wealth (SHIW)	Bank of Italy
Luxembourg	1985	LIS	Socio Economic Panel (PSELL)	CEPS/INSTEAD
Luxembourg	1991	LIS	Socio Economic Panel (PSELL)	CEPS/INSTEAD
Luxembourg	1994	LIS	ECHP	CEPS/INSTEAD
Luxembourg	1997	LIS	ECHP	CEPS/INSTEAD
Luxembourg	2000	LIS	ECHP	CEPS/INSTEAD
Luxembourg	2007	LIS	Panel socio-économique “Liewen zu Letzebuerg” (PSELL III) / Survey on Income and Living Conditions (EU-SILC)	CEPS/INSTEAD
Luxembourg	2010	LIS	Panel socio-économique “Liewen zu Letzebuerg” (PSELL III) / Survey on Income and Living Conditions (EU-SILC)	CEPS/INSTEAD
Netherlands	1990	LIS	Additional Enquiry on the Use of (Public) Services (AVO)	Statistics Netherlands
Netherlands	1993	LIS	Socio-Economic Panel Survey	Statistics Netherlands
Netherlands	1999	LIS	Socio-Economic Panel Survey	Statistics Netherlands
Netherlands	1987	LIS	Additional Enquiry on the Use of (Public) Services (AVO)	Statistics Netherlands
Spain	1995	LIS	Spanish European Community Household Panel / ES ECHP	The National Statistics Institute
Spain	2000	LIS	Spanish European Community Household Panel / ES ECHP	The National Statistics Institute
Spain	2004	LIS	Encuesta de Condiciones de Vida (ECV) / Survey on Income and Living Condition (EU- SILC) 2005 survey	The National Statistics Institute
Spain	2010	LIS	Encuesta de Condiciones de Vida (ECV) / Survey on Income and Living Condition (EU- SILC) 2010 survey	The National Statistics Institute

Sweden	1992	LIS	Income Distribution Survey (HINK)	Statistics Sweden
Sweden	1995	LIS	Income Distribution Survey (HINK)	Statistics Sweden
Switzerland	1992	LIS	Swiss Poverty Survey	Swiss Federal Statistical Office
Switzerland	2000	LIS	Income and Consumption Survey (EVE/ERC)	Swiss Federal Statistical Office
Switzerland	2002	LIS	Income and Consumption Survey (EVE/ERC)	Swiss Federal Statistical Office
Switzerland	2004	LIS	Income and Consumption Survey (EVE/ERC)	Swiss Federal Statistical Office
UK	1979	LIS	Family Expenditure Survey (FES)	UK Data Archive
UK	1986	LIS	Family Expenditure Survey (FES)	UK Data Archive
UK	1991	LIS	Family Expenditure Survey (FES)	UK Data Archive
UK	1999	LIS	Family Resources Survey (FRS)	UK Data Archive
UK	2004	LIS	Family Resources Survey (FRS)	UK Data Archive
UK	2007	LIS	Family Resources Survey (FRS)	UK Data Archive
UK	2010	LIS	Family Resources Survey (FRS)	UK Data Archive
US	1974	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	1986	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	1991	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	1994	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	1997	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	2000	LIS	Current Population Survey (CPS) – March Supplement	U.S. Census Bureau
US	2004	LIS	Current Population Survey - ASEC (Annual Social and Economic Supplement)	U.S. Census Bureau
US	2007	LIS	Current Population Survey - ASEC (Annual Social and Economic Supplement)	U.S. Census Bureau
US	2010	LIS	Current Population Survey - ASEC (Annual Social and Economic Supplement)	U.S. Census Bureau
Austria	1992	MTUS	National time use survey	Statistics Austria
Canada	1992	MTUS	National time use survey	Statistics Canada
Canada	1998	MTUS	National time use survey	Statistics Canada
Denmark	2001	MTUS	National time use survey	Statistics Denmank
France	1998	MTUS	National time use survey	National Institute of Statistics and Economic Studies (INSEE)
Germany	1991	MTUS	National time use survey	German federal statistical office
Germany	2001	MTUS	National time use survey	German federal statistical office
Ireland	2009	MTUS	National time use survey	Central Statistics Office Ireland
Italy	2002	MTUS	National time use survey	Italian National Statistical Institute (ISTAT)
Netherlands	1975	MTUS	National time use survey	Statistics Netherlands
Netherlands	1980	MTUS	National time use survey	Statistics Netherlands
Netherlands	1990	MTUS	National time use survey	Statistics Netherlands
Netherlands	1995	MTUS	National time use survey	Statistics Netherlands

Netherlands	2000	MTUS	National time use survey	Statistics Netherlands
Netherlands	2005	MTUS	National time use survey	Statistics Netherlands
Norway	1981	MTUS	National time use survey	Statistics Norway
Norway	2000	MTUS	National time use survey	Statistics Norway
Spain	2009	MTUS	National time use survey	Instituto Nocaional de Estadistica of Spain
UK	1974	MTUS	National time use survey	UK Office for National Statistics (ONS)
UK	1987	MTUS	National time use survey	UK Office for National Statistics (ONS)
UK	2000	MTUS	National time use survey	UK Office for National Statistics (ONS)
UK	2005	MTUS	National time use survey	UK Office for National Statistics (ONS)
USA	1985	MTUS	National time use survey	U.S. Bureau of Labor Statistics
USA	1992	MTUS	National time use survey	U.S. Bureau of Labor Statistics
USA	1998	MTUS	National time use survey	U.S. Bureau of Labor Statistics
USA	2003	MTUS	National time use survey	U.S. Bureau of Labor Statistics

Chapter IV. Who are the overworked Europeans? A gendered perspective

This chapter argues that extreme work is a hidden obstacle to the maturing of the female revolution. The high prevalence of extreme weekly work hours among the full-time employed makes it difficult for women to pursue the dual ambition of career and motherhood for two main reasons. First, as it is exceedingly difficult to reconcile the needs of children with an extreme job that requires more than 50 hours of work per week, many women self-select themselves into occupations below their skills in exchange for more work-life balance. Second, living in a household with a partner who works extreme hours makes it difficult for women to engage in full time employment because the burden of the household work and care responsibilities, beyond the services provided by the welfare state, is completely left to the extreme worker's (female) partner. In effect, women with an extreme worker partner face an elevated risk of falling in the long-term trap of part-time employment or inactivity, which translates into significant productivity losses at the macro level. The intricate relationships between gender, family status, occupation, and extreme work are revealed by two methods: descriptive analysis based on the occupational class schema proposed by Oesch's (2006) and a series of micro level OLS regressions.

1. Introduction

The Introduction section provides a brief historical context to the current state of gender equality in the labour market. It summarizes the findings of earlier literature on the regulatory and hidden labour market obstacles to the maturing of the female revolution. Next, it argues that the proliferation of extreme work is an important hidden labour market obstacle to gender equality, which earlier literature failed to identify. Finally, it presents a list of hypotheses, which are tested empirically in subsequent sections of the paper.

In Western societies, the unfolding of the female revolution was one of the most substantive social occurrences of the last third of the twentieth century (Esping-Andersen, 2009). Women's quest for emancipation from the role of a homemaker into economically independent, autonomous roles has redefined family life. At the beginning of the twenty-first century, women are much more likely than ever before to be engaged in paid employment outside the home. Women, on average, are more educated than men (OECD statistics). In women's everyday life, self-realisation has come to play a more important role over routine home tasks related to housework, child and elderly care. In terms of household arrangement, women increasingly opt to live in alternative setups to the conventional

breadwinner-homemaker family, including the dual-earner household, childless marriage, single motherhood, and the single-person household.

However, the female revolution is far from being complete (Gerson, 2009; Esping-Andersen, 2009). This is evident both from the analysis of the distributional and demographic outcomes as well as the underlying welfare structures. The share of breadwinner-homemaker households has become marginal is Scandinavian countries (9% in Denmark and 12% in Sweden), but it is still 27% in Austria, 33% in Germany, 41% in Greece, and 38% in Spain (Lewis et al., 2008). The employment level of Scandinavian mothers is practically identical to non-mothers, but there is a 15% employment gap linked to motherhood in Ireland, and a 3% gap in the US (Esping-Andersen, 2009). Furthermore, the female revolution has not reached all women with the same intensity along the skills ladder. Higher-educated, middle-class women are more likely to share the burden of household work with their male partners than lower educated women (Esping-Andersen, 2009).

The notion that the revolution is incomplete is also apparent from the unfavourable demographic changes. Regardless of the persistence of the two-child family ideal among European women (Sobotka and Beaujouan, 2014), the average number of children per women is below 1.5 in most Western European countries (OECD statistics). The discrepancy between preferred and actual number of children suggests that Western political economies have not yet been adapted to the changing needs of families.

In most parts of the Western world, neither the family, nor the market, nor the welfare state provides adequate substitute for the decline in female domestic work. This makes it difficult for women to pursue the dual goals of family and career.

With the decline of the three-generational co-residence, men's rising contribution to household work and child care has become an essential cornerstone of the maturing of the female revolution (Bianchi et al., 2006; Gornick and Meyers, 2008; Hook, 2015). But full-time care for young children and the elderly cannot possibly be solved within the *family*, in which women are also in paid employment. The *market* provides some residential services for the elderly, and child care for young aged children. However, this does not provide a universal support to women, given that access to the market is dependent on financial resources (Blau, 2001; Esping-Andersen, 1999; Hook, 2015).

Finally, where the family and the market fail, the *welfare state* might step in as a last resource of welfare. However, except for the Scandinavian states, and, to some extent, France and Belgium, most European welfare states are lagging behind in terms of family services provision and, more generally, of female employment enhancing policy reforms (Hook, 2015). Moreover, it has been argued that even the most developed welfare states, characterised by progressive welfare policies and prominent levels

of female labour force participation, tend to have a high concentration of women in low-status, female-typed occupations, while the ascent of women into powerful and desirable positions is still impeded by the underlying welfare structures (Mandel and Semyonov, 2006).

Earlier research on the concrete regulatory and labour market obstacles of the maturing of the female revolution has identified a range of institutions which disincentivize women with children from engaging in paid employment outside the home. The lack of affordable elderly and child care as well as of gender-equal parental leave schemes, which encourage fathers to take a leave with small children, makes it difficult for women to commit to full time employment over a lifetime (Abendroth et al., 2012; Keck and Saraceno, 2009). Similarly, a joint taxation regime, which is still in place in some Western European countries, including Germany, penalizes the earnings of the partner whose salary is lower, which is usually the wife (Wrohlich and Steiner, 2004). In effect, joint taxation regimes disincentivise women to continue to pursue career goals after getting married.

Scholarly work has also revealed important hidden labour market obstacles to gender equality. Employment insecurity and the circular trap of part-time employment are believed to be the most important such obstacles. Employment insecurity, induced by the growing prevalence of fixed term and other non-permanent contracts, is an important indirect obstacle, as a growing proportion of women hesitate to have children until they find secure employment (Modena and Sabatini, 2010; Pailhé and Solaz, 2012).

Part-time employment hinders equality in the labour market as it worsens women's career prospects (Lewis et al., 2008; Korpi et al., 2013). Part-time employment was a hallmark of the early stages of women's revolution. From the 1970s, the Scandinavian states created masses of part-time public-sector jobs to boost women's labour market activity. However, in later stages of the 'revolution', when women started to demand a genuinely equal distribution of unpaid work at home and paid work in the labour market, part-time employment was eventually identified as a hidden obstacle to gender equality (Stier and Lewin-Epstein, 2000). Contemporary scholarship maintains that unless used as a temporary solution, part-time employment leaves women in inferior labour market position, as it hampers career advancement. Meanwhile, the Nordic model is increasingly characterised by a dual full-time earner family arrangement (Lewis et al., 2008).

This article argues that the proliferation of the long work hours culture plays an equally, or even more, crucial role in the incompleteness of the female revolution than employment insecurity or part-time employment. The increasing proportion of extreme daily and weekly work hours among the full-time employed makes it difficult for women to pursue the dual ambition of career and motherhood for two main reasons.

First, as it is exceedingly difficult to reconcile the needs of children with an extreme job that requires more than 50 hours of work per week, women self-select themselves into occupations which often require less skills than theirs in exchange for more work-life balance. Bertrand et al. (2010) and Hewlett and Luce (2006) show how extreme hours of work in the corporate and financial sectors drive many women away from high-powered positions. This study demonstrates that the scope of the problem goes beyond the corporate and financial sectors. The presence and proliferation of extreme work hours influences women's career choices in almost all sectors of the economy.

The second reason is less direct from women's perspective. Having a male partner who works extreme hours makes it difficult for women to engage in full time employment because the burden of the household work and care responsibilities, beyond the services provided by the welfare state (or the market), is completely left to the extreme worker's (female) partner. In effect, women with an extreme worker partner face an elevated risk of falling in the long-term trap of part-time employment or inactivity.

To see how gender-relations play out at the level of extreme work, the article tests a list of hypotheses on the relationship between gender, family status, occupation, and work hours.

1) Overall, women are less likely to work extreme hours than men.

2) Women self-select themselves into occupations which are not permeated by the long work hours culture. A large majority of women make career choices based not only on the skills-requirements of an occupation but also on its potential to provide a good work-life balance.

3) The lack of gender equality in top positions can be partly explained by work-life balance considerations. As most high-status occupations prescribe an extreme work schedule, women (who are still the primary care takers in Western societies, Esping-Andersen, 2009) are less likely to take on high status positions than men.

4) Family status plays a decisive role in whether an individual works extreme hours in the United Kingdom and Germany. In both countries, women tend to give up their extreme work once they get married and give birth to children. On the contrary, men tend to become extreme workers once they establish a family.

5) In Sweden, one of the most mature welfare states, family status does not affect individuals' propensity to work extreme hours. With public child care and other welfare provisions, women can continue their chosen career path after establishing a family.

2. Data, methodology

Micro-level survey data is sourced from the harmonised 2013 EU-LFS surveys for the three countries: The United Kingdom, Germany, and Sweden. The sample is restricted to 20-65-year-old workers with at least 30 hours of weekly work. The sample is not restricted according to employment type; thus, it includes wage-earners, self-employed individuals, and employers alike.

The analysis that follows relies on two methodologies. First, it follows Oesch's (2006) methodology in analysing the distribution of individuals across 17 occupational classes and 4 work logics. Then, a micro level regression analysis is conducted to disentangle the relationship between extreme work and individuals' socio-economic background.

Oesch's (2006) class schema reflects the notion that post-industrial employment systems are stratified not only in terms of occupational hierarchies (Erikson and Goldthorpe, 1993) but also in terms of horizontal cleavages (Kriesi, 1989; Kitschelt, 1994; Müller, 1999). For example, low-skilled workers in family services occupy a very different labour market position than low-skilled workers in office jobs. Similarly, high-skilled service providers are in a dissimilar labour market position than technical experts in manufacturing. The horizontal variation is palpable both in terms of the nature of employees' work experience, as well as their work role and their insertion into the division of labour.

These horizontal cleavages are captured by Oesch's class schema through the identification of 4 different work logics. The first one - the *Independent work logic* - includes occupational classes aggregating large employers and the self-employed. The other 3 work logics include occupational classes that fall within the large category of employees. The distinction between *Technical work logic*, O*rganizational work logic*, and *Interpersonal work logic* reflects broad differences between the nature of occupations: whether they involve the deployment of technical expertise and craft, the administration of organizational power, or face-to-face attendance to people's personal needs. The below table, sourced from Oesch (2006), gives an overview of the conceptual distinction between the 4 work logics.

In practice, the distinction of the 17 occupational classes, each of which falls in either of the 4 work logics, is based on multiple aspects of individuals' position in the labour market, not only on educational attainment. In particular, the occupational classes are defined by individuals' three-digit ISCO-occupation codes, professional status (self-employed, employee, employer) and the number of their employees, if any. For an exact summary of the criteria for each occupational class, please refer to the Appendix at the end of the article.

Table 1 *The Dimensions at the Basis of the Three Different Work Logics of Employees*

	Technical work logic	Organizational work logic	Interpersonal work logic
1. *Setting of work process*	Work process determined by technical production parameters	Bureaucratic division of labour	Service setting based on face-to-face exchange
2. *Relations of authority*	Working outside the lines of command for higher grades, working within a clear-cut command structure for lower grades	Working within a bureaucratic command structure that corresponds to a career sequence	Working largely outside the lines of command
3. *Primary orientation*	Orientation towards the professional community or group of trades	Primary orientation towards the employing organization	Orientation towards the client, student, patient or petitioner
4. *Skill requirements*	Scientific expertise for higher grades, crafts and manual skills for lower grades	Coordination and control skills for higher grades, clerical skills for lower grades	Expertise and communicative skills for higher grades, social skills for lower grades

Source: Oesch (2006)

The micro level regression analysis is conducted on the same pool of individuals as the descriptive analysis. To focus entirely on the micro level factors, a series of linear probability models are estimated separately for the three countries: The United Kingdom, Germany, and Sweden. The estimated coefficients indicate the percentage point differences in the probability of an individual being an extreme worker as compared to the control group.

3. The role of extreme work hours in women's labour market position

3.1 Women's share and extreme work hours along the occupational class structure

From the distribution of the workforce across 17 occupational classes and 4 work logics, the segregation of the labour market along the gender lines is apparent. As Table 1 shows, from the 4 work logics, the Independent and Technical work logics are still the realm of men, with women's shares not exceeding 21-26% in any of the three countries. In the other 2 of the 4 work logics, the proportion of men and women is about the same, but women's share is decreasing toward the top of the

occupational hierarchy. In the top occupational categories which require the highest skills and the performance of complex tasks, the share of women is still very low.

One explanation for the gender segregation along different work logics and occupations might be the persistence of traditional cultural norms in terms of women's career choice. Occupations following a Technical work logic clearly remain to be male dominated at least partly because, due to childhood socialisation and inherent interest, women continue to select themselves into conventional female fields of study, such as nursing and humanities (Gregory, 2008). However, closer scrutiny tells us that much of the adjustment in women's carrier choice, resulting in further levels of segregation along the gender lines, occurs at a later phase of life. It is often only at the phase when women enter the labour market that they are faced with the hidden obstacles that hinder the fulfilment of a dual ambition of having a family and the desired career.

By a closer look at the prevalence of extreme work hours in different occupations, it becomes clear that women opt out from occupational labour markets which are permeated by the long work hours culture. Most women do not only make career choices based on skills-requirements and inherent content but also on the occupation's potential to provide a good work-life balance. As Table 1 shows, from the four work logics, Independent work logic is the most likely to prescribe long work hours for the individual and it is also among the two work logics which are still largely dominated by men. The remarkably high prevalence of extreme hours in the Independent work logic is, of course, not surprising given that self-employed individuals are not protected by labour regulation from structural pressures toward longer and more decentralised work schedules.

The same connection between extreme hours and gender can be seen from a closer look at the occupational hierarchies within work logics. In the Organisational work logic, the decreasing share of women toward the top of the occupational hierarchy goes hand in hand with the increasing prevalence of extreme hours. The share of extreme hours is two-to-three times more prevalent among High-grade managers than among medium-level office workers (Associate managers), and approximately four-to-six times more prevalent than among lower-level office clerks (Skilled and Routine office workers).

In the Interpersonal work logic, a similar tendency can be discovered. Sociocultural professionals (journalists, university teachers) are more likely to work extreme hours than Sociocultural semi-professionals (primary school teachers, legal, social and religious associate professionals) or Skilled and Routine service providers. The share of women is also lowest in the top category. Toward the bottom of the hierarchy, the negative relationship between long work hours and women's share is less clear cut. Skilled service providers (cooks, shop salespersons, child and personal care workers, etc.), whose labour market position is around the fine line between insiders and outsiders (Rueda, 2008), are not

only more likely to work extreme hours than those at the very bottom of the hierarchy (Routine service providers) but also more likely to work extreme hours than those in the medium, predominantly insider, category (Sociocultural semi-professionals). This shows that low-skilled women are less likely to be able to select themselves out of occupations which are permeated by the long work hours culture than high-skilled women.

The tendencies are very similar in the Independent work logic. Individuals at the top are the most likely to work extreme hours. Among large employers, the proportion of extreme hours is close to 60% in the United Kingdom, close to 70% in Germany, and 55% in Sweden. At the same time, the share of women among large employers is below 20% in all three countries.

The analysis of long work hours helps us put into perspective an earlier observation that women in top positions are more likely to be childless or have fewer children than their male peers (Landers et al., 1996; Burke 2009). Earlier literature has not emphasised extreme work hours as an explanation for this phenomenon. As extreme work hours are practically incompatible with children's needs and schedules (Jacobs and Gerson, 2004), women with skills that might provide entry to leading positions, which require extremely long work hours, are tacitly forced to choose between career advancement and family.

From a comparative perspective, the analysis of the occupational map provides a further corroboration to theories on the incomplete nature of the female revolution. Germany and the United Kingdom are lagging behind Sweden both in terms of the proportion of women in full-time employment (OECD statistics) as well as of women's advancement to top positions. Table 1 illustrates that from the three countries, Sweden has the highest level of gender equality in top positions, with 46% of women among Technical experts, 45% women among High-grade managers, and 58% women among Sociocultural professionals. The same proportions in Germany and the United Kingdom are much lower: 25% and 35% among Technical experts, 32% and 35% among High-grade managers, while 52% and 56% among Sociocultural professionals, respectively. Again, the pattern of extreme hours follows the opposite trend. Extreme work hours are significantly less prevalent in the top occupational categories in Sweden than in the same occupational categories in the other two countries. The most striking cross-country difference is detected in the Higher-grade managers category, in which the proportion of extreme hours is only 16.7% in Sweden but 28.8% in the United Kingdom and 28.7% in Germany.

In terms of the overall distribution of extreme work across genders, Sweden shows the most balanced picture in all four work logics. While in the Independent work logic, women's share in extreme work is only 1 and 2 percentage points higher in Sweden than in Germany and the United Kingdom, respectively, the same difference in the Technical work logic is 2 and 3 percentage points. In the

Organisational work logic, the difference is 6 and 7 percentage points, while it reaches 17 and 7 percentage points in the Interpersonal service logic. This is consistent with two welfare state theses. First, the large public sector of the Swedish social-democratic welfare state provides not only quality child care and health care services that allow women to return to standard employment, but also increases women's activity rate in full-time employment (Aisenbrey, 2009). Second, once women are in full-time employment in Scandinavia, they face relatively similar cultural and institutional constraints to men (Borchorst and Siim, 2008). This does not seem to be the case in the other two countries.

Finally, placing our results in a macro-focused welfare state context, the results provide an additional layer of empirical evidence to theories on the distinctiveness and successful recalibration of the Nordic welfare model (Kautto and Kvist, 2002; Estevez-Abe, 2006) as well as to converging tendencies between the Continental and Anglo-Saxon model (Streeck and Thelen, 2005; Thelen, 2014).

Table 1: For each country, Column (1): Distribution of active age workers across 4 work logics and 17 occupational classes (in percentages); Column (2): Share of women in each occupational category (in percentages); Column (3): Proportion of extreme work hours in each occupational category (in percentages); Column (4): Women's share in extreme work (in percentages)

	United Kingdom				Germany				Sweden			
	Distribution of individuals	Share of women	Ratio of extreme hours	Women's share in extreme hours	Distribution of individuals	Share of women	Ratio of extreme hours	Women's share in extreme hours	Distribution of individuals	Share of women	Ratio of extreme hours	Women's share in extreme hours
Independent work logic	14.6	(21)	36.1	(17)	11.8	(26)	54.0	(18)	10.9	(24)	44.7	(19)
Large employers	0.8	(20)	59.4	(17)	1.3	(18)	68.0	(13)	0.9	(15)	55.2	(9)
Self-employed professionals	3.0	(24)	31.5	(21)	3.2	(34)	45.6	(25)	2.2	(32)	34.3	(25)
Petite bourgeoisie w. employees	2.1	(23)	50.9	(18)	3.6	(23)	65.2	(17)	3.3	(20)	56.8	(17)
Petite bourgeoisie w/o employees	8.8	(19)	32.1	(16)	3.8	(25)	45.9	(18)	4.6	(26)	38.6	(21)
Technical work logic	29.8	(21)	15.5	(13)	42.8	(23)	10.1	(14)	35.3	(24)	8.7	(16)
Technical experts	10.8	(35)	15.5	(23)	6.8	(25)	18.1	(20)	10.3	(46)	9.1	(36)
Technicians	3.6	(27)	13.6	(14)	11.4	(45)	9.2	(26)	6.5	(25)	8.7	(10)
Skilled crafts	5.9	(3)	15.4	(1)	11.8	(5)	5.7	(2)	8.5	(4)	7.1	(2)
Routine operatives	8.7	(13)	16.1	(8)	11.7	(18)	10.1	(6)	9.0	(17)	9.4	(7)
Routine agricultural	0.8	(13)	20.3	(3)	1.1	(16)	15.1	(11)	1.0	(27)	12.2	(21)
Organisational work logic	32.4	(46)	19.2	(25)	26.1	(50)	13.1	(26)	24.9	(53)	10.9	(32)
Higher-grade managers	17.5	(35)	28.8	(22)	6.8	(32)	28.7	(21)	10.7	(45)	16.7	(29)
Associate managers	6.5	(57)	11.9	(33)	7.1	(53)	9.9	(30)	8.7	(54)	7.6	(37)
Skilled office	6.1	(62)	4.9	(49)	11.1	(58)	6.2	(37)	4.9	(68)	4.6	(46)
Routine office	2.4	(59)	4.6	(40)	1.1	(62)	7.8	(41)	0.6	(47)	4.1	(56)
Interpersonal service logic	23.2	(54)	15.9	(44)	19.2	(57)	11.5	(34)	28.9	(64)	9.1	(51)
Sociocultural professionals	4.5	(56)	28.0	(49)	4.1	(52)	18.5	(39)	4.8	(58)	10.6	(46)
Sociocultural semi-professionals	3.4	(55)	27.6	(54)	2.7	(77)	7.0	(55)	4.9	(76)	8.5	(61)
Skilled service	9.7	(58)	11.1	(38)	7.6	(55)	10.8	(26)	13.2	(69)	9.2	(57)
Routine service	5.8	(43)	7.8	(24)	4.8	(51)	9.1	(31)	6.0	(48)	7.8	(33)
N	24,601				154,943				109,290			

3.2 The distribution of extreme hours across individuals

The second set of hypotheses are tested by the estimation of a series of linear probability models. The models estimate the effects of various characteristics of the probability of being an extreme worker. To focus on the potential effect of the relevant micro-level factors, the regressions are estimated separately for the three countries. The estimated coefficients in Table 2 can be interpreted as percentage point differences in the probability of an individual being an extreme worker as compared to the relevant control group. For example, the estimated coefficients of the first variable (*Female*) show that, all other things equal, women are less likely to work extreme hours than men by 7 percentage points in the United Kingdom, by 6.5 percentage points in Germany, and by 6 percentage points in Sweden.

The first group of variables disentangle the intricate relationship between gender, family status and the probability of working extreme hours. Overall, women are significantly less likely to work extreme hours in all three countries. However, whether an individual woman works extreme hours is strongly dependent on her family status in the United Kingdom and Germany, while it is largely independent from family status in Sweden.

Married women are significantly less likely to work extreme hours than single women in the United Kingdom and Germany (by about 2 percentage points in both countries), which is not the case in Sweden. In the United Kingdom and Germany, women with at least one child are significantly less likely to be extreme workers than childless women. The difference is about 2 percentage points in the United Kingdom and 4 percentage points in Germany. This means that British married women with at least one child are 4 percentage points less likely to have an extreme job than single, childless women. The same difference is even higher, 6 percentage points, in Germany. A 6 percentage-point difference is large given that the overall average probability of being an extreme worker is about 10-15%. (Due to lack of available data, only the effect of marriage can be measured for Sweden, not that of having children.)

On the other hand, the effect of marriage on men's labour supply is quite the opposite. Men are significantly more likely to work extreme hours after getting married than before marriage, both in the United Kingdom and Germany. The difference in probability is about 2 percentage points in the United Kingdom and close to 3 percentage points in Germany. In contrast, Swedish men are not significantly more likely to work extreme hours after marriage than before. The effect of becoming fathers is positive, but not significant in any of the specifications.

One of the most striking result is the similarity between the British and the German case. In the two countries, many women seem to give up their extreme jobs once they get married, while men are more likely to increase their work hours to extreme levels. In complete contrast, marriage does not affect individuals' propensity to work extreme hours in Sweden. This is evidence for the notion that it is only in Sweden that the educational, health care and child care institutions of the welfare state are truly effective in incentivising women to remain active in the labour market after establishing a family. At the same time, they are also effective in incentivising men to share the burden of household and care responsibilities in a relatively equal manner.

With regards to the effect of individuals' highest educational attainment, regression results presented in Table 2 support earlier results, presented in Chapter II of this dissertation. In the United Kingdom and Germany, it is the high-skilled workforce that is most prone to extreme hours, while it is the low-skilled strata of the labour market which is the least prone to extreme work. Sweden, again, stands out as the only country from the three in which individuals' skills levels do not influence their probability of working very long hours.

Table 2: Determinants of an individual being an extreme worker; results from linear probability models

	Dummy for extreme work hours			Dummy for extreme work hours		
	United Kingdom	Germany	Sweden	United Kingdom	Germany	Sweden
VARIABLES						
Female	-0.071***	-0.065***	-0.061***	-0.088***	-0.068***	-0.062***
	(0.008)	(0.003)	(0.003)	(0.008)	(0.003)	(0.003)
Married if Male	0.018**	0.026***	-0.004	0.025***	0.034***	0.001
	(0.007)	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)
Married if Female	-0.019***	-0.020***	-0.010	-0.011***	-0.019***	-0.009**
	(0.011)	(0.004)	(0.004)	(0.011)	(0.004)	(0.004)
Has children if Male	0.010	0.001		0.014*	0.002	
	(0.007)	(0.003)		(0.007)	(0.003)	
Has children if Female	-0.023***	-0.038***		-0.015**	-0.038***	
	(0.011)	(0.004)		(0.012)	(0.005)	
Age	0.007***	0.007***	0.003***	0.009***	0.008***	0.004***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Age-squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education						
High-skilled	0.022***	0.051***	-0.002	0.051***	0.080***	0.012***
	(0.006)	(0.002)	(0.003)	(0.006)	(0.002)	(0.002)
Low-skilled	-0.023***	-0.022***	0.000	-0.028***	-0.019***	-0.000
	(0.007)	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)
Occupational classes						
Large employer	0.475***	0.553***	0.478***			
	(0.030)	(0.008)	(0.011)			
Self-employed professional	0.196***	0.334***	0.283***			
	(0.018)	(0.006)	(0.008)			
Petite bourgeoisie w. employees	0.410***	0.538***	0.491***			
	(0.020)	(0.005)	(0.007)			
Petite bourgeoisie w/o employees	0.238***	0.359***	0.320***			
	(0.013)	(0.005)	(0.006)			
Technical expert	0.053***	0.046***	0.032***			
	(0.013)	(0.004)	(0.005)			
Technician	0.038**	0.004	0.015**			
	(0.017)	(0.004)	(0.006)			
Skilled craft	0.047***	-0.046***	-0.014***			
	(0.015)	(0.004)	(0.005)			
Routine operative	0.076***	0.009**	0.016***			
	(0.014)	(0.004)	(0.005)			
Routine agricultural	0.121***	0.061***	0.036***			
	(0.030)	(0.009)	(0.010)			
Higher grade manager	0.189***	0.166***	0.104***			
	(0.012)	(0.004)	(0.005)			
Associate manager	0.048***	0.015***	0.021***			
	(0.014)	(0.004)	(0.005)			
Routine office	-0.003	0.017**	-0.022*			
	(0.019)	(0.008)	(0.013)			
Sociocultural professional	0.197***	0.075***	0.054***			
	(0.016)	(0.005)	(0.006)			
Sociocultural semi-professional	0.204***	0.011*	0.043***			
	(0.017)	(0.006)	(0.006)			
Skilled service	0.057***	0.050***	0.050***			
	(0.013)	(0.004)	(0.005)			
Routine service	0.019	0.030***	0.013**			
	(0.015)	(0.005)	(0.006)			
Work logics						
Independent work logic				0.155***	0.372***	0.327***
				(0.008)	(0.003)	(0.004)
Technical work logic				-0.053***	-0.048***	-0.035***
				(0.007)	(0.002)	(0.003)
Interpersonal work logic				-0.009	-0.002	-0.006**
				(0.007)	(0.003)	(0.003)
Constant	-0.059**	-0.050***	0.040***	-0.003	-0.029***	0.056***
	(0.028)	(0.009)	(0.012)	(0.027)	(0.009)	(0.011)
Observations	23,785	153,953	108,535	23,785	153,953	108,535
R-squared	0.090	0.197	0.125	0.062	0.177	0.112
Standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

The direction and magnitude of the occupational controls are in line with expectations coming from the analysis of the previous Subsection. To control for the influence of occupational work cultures, the first three specifications include 16 dummies for Oesch's occupational classes. For control group, the Skilled office category was chosen. This includes professions such as general office clerk, secretary, client information worker, numerical clerk, and material recording and transport clerk – types of occupations that existed already in the industrial era and that are probably easy to relate to for the reader. The results of the regression analysis corroborate our first insights on the relationship of extreme work and women's share in occupations.

Table 1 shows that individuals in non-technical occupations that require high-skills and the performance of complex tasks are the most likely to work extreme weekly hours. Large employers are by 47 to 55 percentage points more likely to be extreme workers than Skilled office workers. Self-employed professionals, Higher-grade managers, and Sociocultural professionals are by about 20 percentage points more likely to work long hours than Skilled office workers. In contrast, individuals employed in low status occupations, such as Routine office and Routine service positions, are generally less likely to be affected by the long work hours culture.

Finally, to control for the influence of different work logics, the second three specifications include work logic dummies instead of the occupational class dummies. For control group, the Organisational work logic was chosen. As expected, self-employed people and large employers, aggregated in the Independent work logic, are significantly more likely to work very long hours than office workers. On the contrary, individuals whose work involves the deployment of technical expertise and craft, whose occupation falls under the umbrella of the Technical work logic, are significantly less likely to do so, in all three countries. Individuals in occupations that follow the Interpersonal work logic are about as likely to be exposed to the long work hours culture as office workers, in general.

In sum, even after controlling for occupations, family status plays a crucial role in whether an individual works very long hours in the United Kingdom and Germany. In both countries, women are likely to give up their extreme work once they get married and give birth to children. On the contrary, men are more likely to become extreme workers once they establish a family. It is only in the most mature welfare state, in Sweden, that family status does not affect an individual's propensity to work extreme hours.

This shows that extreme work is an important hidden obstacle in the maturing of the female revolution. As earlier scholarly investigations have not identified the implications of extreme work on gender equality in a systematic manner, neither its policy consequences (on individuals' ideological preferences, etc.) nor the countervailing policy responses are adequately discovered.

4. Conclusion

Earlier literature has identified the increasing prevalence of atypical employment and part-time employment as the most important hidden labour market obstacles to gender equality. This article demonstrates that the proliferation of the long work hours culture plays an equally crucial role in the incompleteness of the female revolution. The increasing proportion of extreme work hours among the full-time employed makes it difficult for women to pursue the dual ambition of career and motherhood for two main reasons.

First, as it is impossible to reconcile the needs of children with an extreme job that requires more than 50 hours of work per week, women self-select themselves into occupations which might require less skills than theirs in exchange for better work-life balance. Second, having a male partner who works extreme hours makes it difficult for women to engage in full time employment outside the home. This is because the burden of the household work and care responsibilities, beyond the services provided by the welfare state (and the market), is completely left with the extreme worker's (female) partner. In effect, women with an extreme worker partner face an elevated risk of falling in the long-term trap of part-time employment or becoming inactive.

From the distribution of the workforce across 17 occupational classes and 4 work logics, the segregation of the labour market along the gender lines is apparent. The share of women is smallest in occupations in which extreme work hours are prevalent. and vice-versa. This suggests that women do not only make career choices based on skills-requirements and content of the occupation, but also on its potential to provide a good work-life balance.

From a comparative perspective, the analysis of the occupational map provides an empirical corroboration to theories on the incomplete nature of the female revolution in large parts of Europe. It is only in the Swedish social-democratic welfare state that the share of women approximates that of men in top positions. Women's relatively high share in top positions in Sweden corresponds to the comparatively low proportions of extreme work hours in the respective occupational categories in that country.

Regression analysis suggests that individuals' family status strongly affects their propensity to work extreme hours in the United Kingdom and Germany, but not in Sweden. In the first two countries, a sizeable proportion of women give up their extreme jobs once they get married, while men tend to respond to the same change in their family status by increasing their work hours to extreme levels. In contrast, in Sweden, whether an individual works very long hours is independent from their family status. This is a new layer of evidence for the notion that the Swedish social-democratic model of

welfare state is the most developed in terms of providing educational, health care and family provisions which enable women to pursue a chosen career path, independent of changes in their family status.

The results of our analysis suggest that the Nordic model has gone furthest in supporting for the transformation of women's role from homemaker to partner, both at home and in the labour market. However, our results also suggest that a true equality is far from being reached even in the Nordic model.

In sum, our analysis on the socio-economic background of individuals with extreme work hours provides an important extension to the literature offering a class-based analysis of the gender implications of welfare policies (Hook, 2015; Korpi et al., 2013). It shows that beyond family provisions, regulatory incentives for part-time female employment, and atypical employment, women's labour supply is also influenced by the extent to which occupational labour markets are permeated by the long work hours culture.

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Appendix – The mapping of ISCO-08 codes into occupational classes
(identical for the UK, German, and Swedish samples)

<table>
<tr><td>Large employers: SELF and 10 or more employees</td><td>Self-employed professionals: SELF and 21; 211-265 (and less than 10 employees)</td><td colspan="2">Technical experts: 133; 21; 211-226; 251-252</td><td>Higher-grade managers and administrators: 11; 111-132; 134-143; 241-243; 261</td><td>Sociocultural professionals: 231-233; 235; 262-265</td></tr>
<tr><td colspan="2">Petite bourgeoisie with employees: SELF and less than 10 employees (and not 21; 211-265)</td><td colspan="2">Technicians: 31; 311-325; 351-352</td><td>Associate managers and administrators: 331-335</td><td>Sociocultural semi-professionals: 234; 341-343</td></tr>
<tr><td colspan="2">Petite bourgeoisie without employees: SELF and no employees (and not 21; 211-265)</td><td colspan="2">Skilled crafts: 711-712; 721-742; 831</td><td>Skilled office: 411-412; 421-422; 431-432</td><td>Skilled service: 511-512; 522; 531-541</td></tr>
<tr><td colspan="2"></td><td>Routine operatives: 713; 751-754; 811-821; 833-835; 931-933</td><td>Routine agricultural: 611-634; 921</td><td>Routine office: 413; 441</td><td>Routine service: 513-516; 521; 523-524; 832; 911-912; 941-962</td></tr>
</table>

Chapter V. Extreme work hours as an indicator of winner-take-all dynamics in European labour markets

Since Piketty (2014) analysed historical tax records and showed that income concentration at the very top of the income distribution sharply increased since the 1980s, not only in the United States but in Western European countries as well, a new wave of comparative political economy research has sought to reveal the roots of this pattern. This paper examines the structure of Western European countries' labour markets and suggests that the relative size of the yet to be conceptualised 'winner-take-all' labour market segment provides an important explanation for why some countries are more equal at the top than others. Using microdata from the EU Labour Force Surveys (EU-LFS), it is shown that political economies that are more permeated by winner-take-all occupational labour markets suffer from significantly higher levels of top income concentration. For the demarcation of occupations in which winner-take-all structures prevail, extreme work is used as an instrument. Extreme work, or, more precisely, the proportion of extreme work hours, is an excellent instrument because the existence of the long work hours culture represents a list of underlying macro- and meso-institutional phenomena.

1. Introduction

The sharp rise in income inequalities, and of income concentration at the top 1% of wage earners, in advanced democracies has become a central topic in political economy debate. For scholars of comparative political economy, the increasing level of top income concentration in the United States and the United Kingdom does not come as a surprise, given these countries' liberal labour market and welfare regime traditions. What seems surprising, however, is that the top 1% income share has also increased in all other Western European countries. Data collected by the Paris School of Economics' World Wealth and Income Database shows that between 1995 and 2010, the income share of the top 1% wage earners in Germany has increased from 9% to 13%. Although the rise has been slightly more moderate in countries characterized by social democratic welfare traditions, the direction of change has been the same across all advanced democratic economies in Europe -- the gap between the top 1% and everyone else has widened.

Earlier literature on the roots of income inequality suffers from one or both of two shortcomings. First, it does not focus adequately on changes at the very top of the income distribution. Second, it neglects the importance of the changes in the structure of labour markets as a mechanism through which top income concentration has soared. To fill a gap in the literature, this paper focuses on income inequality

between the top 1% wage earners and the rest of the labour force and traces back the variation to different levels of labour market segmentation within the insider segment. It proposes that the relative size of the 'winner-take-all' labour market segment provides an important explanation for the variation in top income concentration in Western European countries. In other words, the paper suggests a theoretical refinement to the literature on the insider-outsider labour market divide (Rueda, 2006; Palier and Thelen, 2010). It proposes that that the 'insider' labour market segment, as conceptualised by the dualization literature, has parted into two distinct post-industrial segments: 1) a 'winner-take-all segment', characterized by a radical wage dispersion between a few top managers and the rest of the workers with high skills in the same occupation, a race-to-the-bottom type of competition among the high-skilled workforce, low unionization rates, and high drop-out rates among mid-career professionals; and 2) a 'traditional insider segment', where middle class employment is still for a lifetime, with most workers realistically counting on a steady, 45-degree line, advancement path.

This paper investigates the structural changes of the past decades that have contributed to changes in the quality of work and essentially the emergence of winner-take-all dynamics in many high-skilled occupational labour markets. Methodologically, the paper offers an innovative instrument (the prevalence of extreme work hours among professionals in each occupation) for the demarcation of those occupational labour markets in which winner-take-all dynamics have prevailed.

The prevalence of extreme work hours in each occupation is an excellent interdisciplinary instrument because it represents a list of underlying macro- and meso-structural phenomena which indicate a shift away from traditional 'insiderness'. The high prevalence of extreme work hours might indicate a range of different disciplinary aspects of change. For example, a work culture that prescribes long hours to many professionals in an occupation might indicate the lack of unionization of the profession or the existence of fierce competitive pressures among professionals, but also the existence of a male dominated work culture in which gender equality is not a priority. The following paragraphs explicate these three different disciplinary angles.

1) The industrial relations literature focuses on the characteristics of the collective bargaining system. It suggests that strongly unionized segments of the labour market are not only more equal in monetary terms but also in terms of employment quality, e.g. security against employers' discretion to determining workers work time schedule (Streeck 2009). Thus, a large proportion of workers with extremely long work hours indicates a lack of representation of the given occupation in collective bargaining.

2) The microeconomics literature addresses the question of competitiveness among workers in the same labour market. Instead of focusing on the strengths of the position of workers vis-à-vis their

employers, as done by the industrial relations literature, it focuses on the position of workers vis-à-vis their competitors. Microeconomic theory suggests that intensive competition, other things being equal, drives up workers' work hours (Varian, 2014), thus the high prevalence of extreme work hours indicates the existence of fierce competitive pressures among workers in the given occupational labour market. The sources of intense competition among professionals might be manifold, e.g. increasing international competition among workers as post-industrial labour markets are becoming ever more connected (Rodrik, 1997; Wren, 2013), the continuous restructuring of global value chains which worsens workers' prospects for job stability (Krings et al., 2009), or the notion that the globalisation of markets raises that stakes, as a few winner products can gain a large share of the global market (Frank and Cook, 2010).

3) The gendered labour market research generally associates the long work week culture with low levels of gender equality in terms of labour market perspectives, examined both in a macro-institutional comparison (Krings et. al., 2009; Esping-Andersen, 2009) as well as in certain occupations (Bertrand et al., 2010; Hewlett and Luce, 2006). A work culture that incentivises workers to compete on work hours makes it difficult for women to pursue a gradual and continuous career development path as women are still the primary care takers in Western societies (Esping-Andersen, 2009; Jacobs and Gerson, 1998).

In sum, the paper argues that liberalising trends in collective bargaining, intensified international competition among workers, and the disregard of the gender aspect throughout the development of corporate work cultures, all of which manifests themselves in the lengthening of the full-time work week, have brought about the transformation of many high-skilled professions from 'insider' to 'winner-take-all' occupations.

To disaggregate occupations that are increasingly organized in a winner-take-all structure in Western European countries from occupations which are still characterised by the traits of the traditional insider segment, the empirical analysis of the paper uses the indicator of the ratio of extreme - 50 or more - weekly work hours among professionals in the same occupational labour market. The 50 hours threshold is chosen because it is commonly used in the work time literature as the highest bracket of work time distribution (e.g. Jacobs and Gerson 2004; OECD statistics).

Once we are more attentive to the new labour market divide - the qualitative differences in employment relations between the winner-take-all segment and the traditional insider segment - , we are one step closer to understanding the role of the labour market as an intermediary channel between economic drivers, public policy and outcomes in top income concentration. The empirical part of the paper shows that countries which are permeated by winner-take-all occupational labour markets

suffer from significantly higher levels of income inequality at the top than countries in which most high-skilled occupations still provide an 'insider' career path to professionals. More precisely, the paper argues that the relative size of the new winner-take-all segment provides an important explanation for why some countries are more equal at the top than others.

The next section outlines the proposed novel labour market typology comprising three labour market segments: the 'winner-take-all' segment, the traditional 'insider' segment, and the 'outsider' segment. It then places the theoretical contribution into the body of existing literature on the political economy sources of rising top income concentration. Section 3 offers a systematic empirical mapping of the occupational labour markets of Western European countries since 1995, using microdata from the harmonized 2013 EU-LFS surveys. Section 4 provides an econometric analysis of the relationship between the relative size of a country's winner-take-all labour market segment and top income concentration. Section 5. concludes the analysis.

2. Theory

2.1 A proposed concept for a 'winner-take-all labour market segment'

The notion that post-industrial labour markets are segmented, with two distinct labour market segments existing parallel to each other, have been suggested in both the economics and the political science literature (Piore 1975; Palier and Thelen 2010; Emmenegger et al. 2012; Lindvall and Rueda 2012). It has been recognized that temporary contracts and the myriad flexible contract forms have contributed to the creation of a low-paid outsider labour market segment in which employment is less secure and the prospects for advancement are low (Tomlinson and Walker 2012). As a close synonym to labour market segmentation, the political science discussion refers to the phenomenon as labour market dualism. It distinguishes conceptually the process of dualization, the output in institutional dualism, and the outcome in social divides (Emmenegger et al. 2012).

Given the abundance of research dedicated to the mapping of post-industrial labour market segments, the new divide at the higher strata of the labour market, within the traditional insider segment, has received surprisingly little attention. Häusermann et al. (2014) recognize that labour market vulnerability spreads well into highly educated segments of the workforce, which they even conceptualize as 'high-skilled outsiderness', but they do not investigate the process through which the new divide within the insider segment emerged.

Our concept of winner-take-all labour market segment provides an interdisciplinary approach to explaining why 'high-skilled outsiderness' has emerged in many occupational labour markets over the past decades.

The idea to conceptualise 'winner-take-all' occupational labour markets and the 'winner-take-all' labour market segment was first and foremost inspired by the micro-economic account of Frank (2005) on 'winner-take-all markets'. Winner-take-all markets are defined in the micro-economic literature as inefficiently competitive labour markets in which all participants exert significant effort to be among the best performers, but rewards tend to be concentrated in the hands of a few top performers. This means that marginal differences in performance give rise to enormous differences in income. The inequality in incomes is the result of the fact that the distribution of income on winner-take-all markets is based on relative performance rather than on absolute performance. Standard economic theory neglects the analysis of these markets because their prevalence has been believed to be marginal in advanced capitalist labour markets. Standard economic theory postulates that most labour markets are 'competitive' in the classical sense, that is, the distribution of income is based on absolute performance. In contrast, it is an inherent characteristic of winner-take-all markets that they provide huge rewards to a few top performers while those performing just slightly below them earn significantly less.

The 'social inefficiency' of winner-take-all markets stems from the unproductive investments – in time and effort - that all the competitors, workers performing tasks in the same labour market, make to enhance their prospects of winning. Competition on winner-take-all markets can be thought of as a 'positional arms race'. Each competitor suffers an unacceptable loss of position if they buy no arms while their rivals do. Thus, all competitors buy arms and, apart from the few final winners, everyone loses in the race (Frank and Cook 2010).

It is an inherent characteristic of winner-take-all dynamics in occupational hierarchies that the number of positions radically decreases upwards, implying that those who are unable or unwilling to make the personal sacrifices that this career path entails are forced to drop out from the professional race. This could mean that highly skilled employees with specialized skills continue their careers in a traditional insider occupation which might require lower or more general skills than theirs, or that they drop out from the labour market.

To put the micro-economic concept into historical context, it is worth considering that before the 1980s, only a handful of occupational labour markets were structured in a winner-take-all hierarchy in Western Europe and North America. The international superstar effect has always been known in competitive sports and arts but not in the traditional white collar or professional occupations. The

world's best tennis and piano players have always enjoyed a superstar status while the second-tier players remained unknown for the masses and, accordingly, received only moderate compensations for their heroic endeavours.

However, since the beginning of the 1980s, labour markets have gone through significant structural changes. As one important development, the number of occupational labour markets that are organised in a winner-take-all structure has gradually increased. The political economy reasons for that are manifold, a selective list of which can be summarised as follows.

1) The internationalisation of several occupational labour markets has increased the pool of high-skilled workers who 'compete' with each other. The advancements in information technology and the increased interconnectedness of post-industrial labour markets have created a new labour market structure in which much of the barriers, that once prevented professionals from fierce competition with each other, have been removed (Rodrik 1997; Wren 2013). Among the most relevant policy and structural trends that contribute to the internationalisation of labour markets, we should think in the first instance about the removal of legal barriers of labour mobility, the emergence of English as the de facto international language, and the proliferation of cheap transportation means.

In the second instance, global market consolidations have concentrated the most complex tasks in the hands of a few high-skilled workers. Today's most advanced global economies are characterized by a small number of giant companies enjoying unprecedented market shares and profit margins. Yet, while traditional multinational companies had employed many employees, post-industrial companies with large market shares employ far fewer workers (The Economist 2016).

2) In the new global economic order, as briefly mentioned in earlier paragraphs, the economic success of products and services (and thus of the producers or providers of those) is increasingly based on a relative scale, with a few winner products quickly flooding the entire market, pushing all the other, oftentimes just slightly worse, products into oblivion. This type of business environment has been primarily the results of the widening of the reach of multinational companies' distribution channels, but it has been equally reinforced by regulatory changes (Frank and Cook 2010; Rodrik 1997).

3) From the consumers' perspective, the identification and the consensus building about the identity of the best products, services, and professionals has become easy with the help of new information technologies. The name, or the brand, of Europe's or a given country's best trending fast food chains, architects, medical doctors, journalists, hotels and restaurants, financial lawyers, designers, business consultants, academic researchers in the highlight of media attention, etc., have become well known for the wider public.

4) At the same time, among high-skilled workers, unionization rates radically dropped (Thelen, 2014), and the scope of regulatory exemptions – e.g. from work time regulation - has radically widened (Wren 2013; Schor 2000; Jacobs and Gerson 1998), exacerbating structural tendencies toward a race-to-the-bottom type of competition among high-skilled workers in non-sheltered sectors of the economy.

As the name of the concept itself emphasises, a few successful professionals take-it-all in 'winner-take-all' labour markets. The winners are in an exceptionally privileged labour market position, both in terms of remuneration and in terms of demand for their work.

However, what is even more important to emphasize is the notion that the privileged position of the winners is in striking contrast with the insecure position of the rest of the workforce – more precisely, most of the workforce - in winner-take-all occupations. The lack of institutional and regulatory protection, coupled with a fierce competition among professionals, results in a new type of high-skilled vulnerability, one that prevents professionals from living a good quality of life, that is, having a stable middle-class job which provides a gradual, 45-degree line advancement path, which provides workers a good work-life balance.

As an outcome of the new labour market structures, young and mid-career professionals are increasingly facing the reality of a career path characterized by a sequence of unpaid or low-paid internships, fix-term and other forms of non-permanent contracts, with relatively poor prospects for job stability (Krings et. al 2009). As shown in the first dissertation paper, large pools of professionals work extreme hours on a regular basis – a phenomenon that has been associated with several mental and physical health problems, such as burn-out and cardiovascular illnesses (Spurgeon et al. 1997; Virtanen et al. 2009).

Illustrative examples of career breaks and complete resignations in winner-take-all labour markets include academics who drop out from academia after their post-doc positions; business consultants who quit their around-the-clock jobs with huge travel requirements because they suffer from burn-out (Hewlett and Luce 2006); financial lawyers who are unable to return to work after maternity leave precisely because of the long work hours work culture (Bertrand et al, 2010); logistics and advertising managers who lose their jobs as a result of a global value chain restructuring; or medical doctors who quit their profession after being diagnosed with illnesses associated with irregular work schedules, including regular night shifts.

As the examples illustrate, the post-industrial labour markets of Western European countries constitute a list of high-skilled occupational labour markets which are not organized in the traditional white-collar scheme. Post-industrialism has restructured labour markets not only at the lower but also the higher strata of the labour market.

2.2 Existing theories of top income concentration

2.2.1 Economic accounts of rising income inequality

Economic accounts of the rising income inequality traditionally link the general increasing trend to macro-level structural drivers, such as deindustrialization, globalization, and a concomitant change in technologies. Deindustrialization and globalization have been associated with the gradual phasing out of middle-class jobs in manufacturing and essentially the formation of a more polarized labour market structure with large numbers of low-paid service-sector jobs, on the one hand, and high-paid professional service sector jobs, on the other hand (OECD 2016, Autor et al. 2003; Frey and Osborne 2013). One of the most widely articulated economic theories on the causes of rising inequality suggests that the post-industrial transformation brought about a "skills-biased technological change" – a move towards a new labour market structure in which the highly educated are disproportionately rewarded for their specialized skills as compared to the rest of the labour force (Berman et al. 1998; Goldin and Katz 2008).

While wage dispersion between the well-educated and the rest of the society has also increased in advanced economies, evidence presented by the new wave of top income research (Piketty 2014; Piketty and Saez 2003) suggests that the most important change in the shape of advanced democracies' income distribution was the pulling away of the top 1%, not a growing divide between those with advanced degrees and those without. Most of the wage earners belonging to the top 1% are indeed highly educated, but so too are those making significantly less who have been lately losing ground.

Macro-economic accounts also fall short on explaining the cross-national variation across Western European democracies. Despite common large-scale trends in openness, the pace of de-industrialization, and the concomitant technology change, there are persistent cross-national differences in the level of top income concentration. In 2010, the top 1% earned more than 11% of the national income in Ireland, the United Kingdom, and Germany, while the respective ratios were below 7% in Sweden, the Netherlands, and Denmark. Clearly, we need to examine a list of policy and macro-institutional factors to arrive to a more complex understanding of why some nations are more unequal at the top than others.

2.2.2 Political accounts of rising income inequality

Political accounts fare much better in explaining cross-national differences in income inequality. However, they focus, almost exclusively, on the policies and institutional structures that affect the shape of the income distribution towards the bottom income deciles (Esping-Andersen 1990; Iversen

and Wren 1998, Emmenegger et al. 2012; Palier and Thelen 2010; Lindvall and Rueda 2012; Vlandas 2013), and similarly to economic accounts of income inequality, they do not pay adequate attention to changing trends in the structure of labour markets.

It was only with the recent discovery about the winner-take-all pattern of income inequality that shifted the focus towards the functioning of the higher strata of the labour market, and with that it opened the way to a new wave of inequality research.

2.2.3 A new wave of political economy research on top income concentration

The most influential pioneer of the new wave, Piketty (2014), reveals the historical trends in income inequality in several advanced economies. Based on the statistical study of historical tax records, he shows that the increase in wage inequality in the United States and several Western European countries is due mainly to increased pay at the very top end of the income distribution. Piketty hypothesises that the stupendous increase of the very top incomes can only be explained by institutional changes, as the economic theories of marginal productivity and of the race between technology and education do not provide plausible explanations. There is no evidence suggesting that top managers are more productive and have better skills than much of the high-skilled labour force. However, besides giving the reader a hint on the existence of certain politically set institutions that might explain why and how top managers gained the power to set their own remuneration, Piketty does not include in his mind-provoking book, *Capital in the Twenty-First Century,* an analysis of the potential influencing power of political institutions.

Hacker and Pierson (2010) offer the first political analysis on the political roots of winner-take-all inequality in the United States. However, their analysis focuses only on one country, and, as it is the case with all one-country analyses, it misses comparative elements. Nevertheless, by tracing the processes through which organizational interest groups have influenced policy makers in the United States since the 1980s, and by showing that the new trend is rooted in fundamental shifts in four core public policy areas: the regulation of financial markets, corporate governance, industrial relations, and taxation, their analysis provides an excellent theoretical starting point also for a comparative analysis of top income inequality.

Finally, the newest piece of comparative political analysis on top income inequality is provided by Angeles et al. (2016) who propose a political economy theory of contingent policy diffusion to explain some of the cross-national variation in the level of top income concentration. They argue that US multinationals are exporting the US-style culture of executive remuneration as they enter the markets of other countries, and while doing that, they increase the salary competition in local markets, pushing also domestic companies to pay higher salaries for their top staff. Furthermore, they show that the

size of this effect depends on the configuration of local political institutions. While they implicitly recognise that the emergence and proliferation of winner-take-all labour market structures is part of the policy diffusion mechanism that leads to higher levels of top income concentration, they do not articulate their argument in a framework that relies on concepts related to labour market structures.

Overall, a distinguishing characteristic of this new wave of literature as compared to the earlier literature on income inequality is that the new pieces of research excel in consistency about the rising trend of income inequality at the top of the economic ladder in the advanced West. However, neither of these studies focuses on revealing the concomitant structural changes in the labour markets of these economies.

To pin down the phenomenon that this paper aims to explain, Table 1 summarizes the changes in top 1% income concentration in all Western European countries for which relevant data is available in the World Wealth and Income Database of the Paris School of Economics. As the table shows, the level of top income concentration has increased in each of these countries over the course of the past three decades. Furthermore, it shows that there is heterogeneity in both the level and the magnitude of change across countries.

Table 1: Change in the top 1% income share in 13 Western European countries

Country	Top 1% income share in 1980/1981	Top 1% income share in 2009/2010	% point change
Denmark	5.47%	6.41%	+ 0.94
Finland	4.32%	7.46%	+ 3.14
France	7.63%	8.11%	+ 0.48
Germany	9.97%	12.81%	+ 2.84
Ireland	6.65%	10.5%	+ 3.85
Italy	6.47%	9.38%	+ 2.91
Netherlands	5.85%	6.45%	+ 0.6
Norway	4.6%	7.74%	+ 3.14
Portugal	4.32%	9.77%*	+ 5.45
Spain	7.5%	8.14%	+ 0.64
Sweden	4.05%	6.91%	+ 2.86
Switzerland	8.4%	10.63%	+ 2.23
United Kingdom	6.67%	12.55%	+ 5.88

Source: World Wealth and Income Database of the Paris School of Economics;
**for Portugal, the last available data from 2005 is reported*

3. Measuring the size of the winner-take-all segment

3.1 Methodology

The empirical part of the paper tests the hypothesis that the rise in top income concentration is associated with concomitant changes in the labour markets. In a cross-national comparison, top income concentration in Western European countries can be explained by the extent to which their political economies are permeated by winner-take-all occupational labour markets.

To indicate whether winner-take-all dynamics prevail in each of the 170 (three-digit ISCO coded) occupational labour markets in 17 Western European countries, the indicator of the 'ratio of extreme work hours' is used. After calculating the proportion of extreme work hours in 170 occupational categories in each country for each available year between 1995 and 2013, using micro-data from the harmonized EU-LFS surveys, the threshold of 20% (working extreme weekly hours among professionals in a given occupation) is used to distinguish winner-take-all labour occupations from the traditional insider occupations. Those high-skilled occupations in which more than 20% of workers work more than 50 hours per week (in their first and second jobs) are considered as winner-take-all labour markets.

More precisely, the following methodological choices are followed.

1) Individuals' total actual weekly work time is the sum of their weekly work hours in their primary and secondary jobs.

2) An individual's total actual weekly work time is 'extreme' if it exceeds 50.

3) An ISCO occupational category is flagged as potentially winner-take-all, if the proportion of workers with 'extreme' work hours exceeds 20% among the pool of workers with a minimum one hour of reported work.

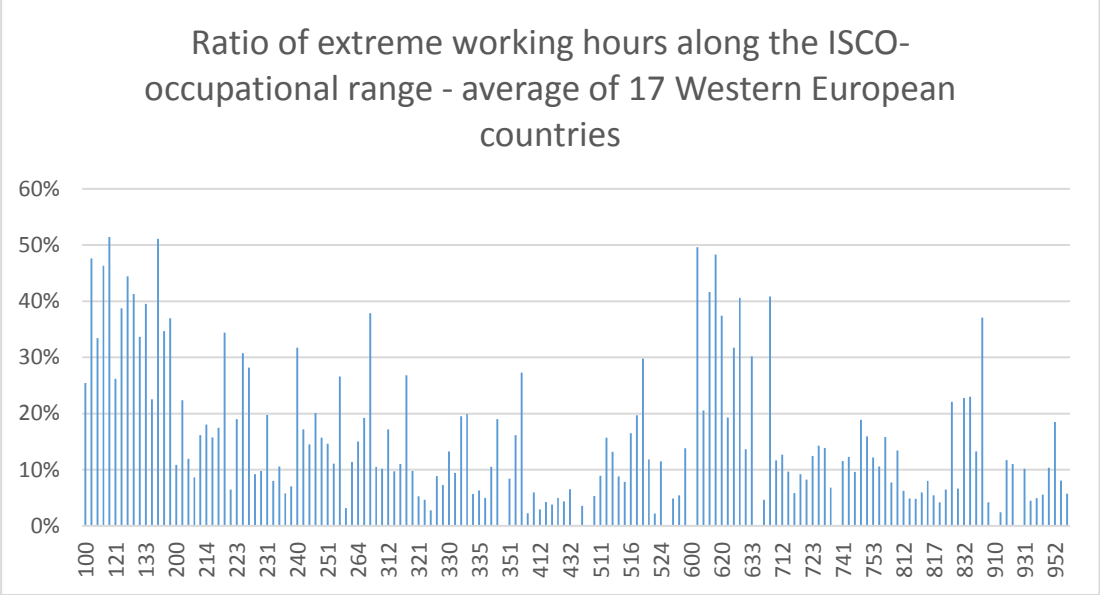
4) For theoretical considerations, only high-skilled occupations can be labelled as winner-take-all. High-skilled occupational categories are defined as 3-digit ISCO categories between 100 and 399 (within the full range of 100 – 999).

The 2013 EU-LFS surveys include relevant variables for all these criteria: a 3-digit ISCO code on respondents' occupation, respondents' actual work hours in their primary and secondary jobs, and a list of variables on their socio-economic background. The variable on individuals' occupation is coded in a way that we find the occupational categories that require the most complex skills and knowledge at one end of the occupational range while we find categories that require the least of these at the other end of the range.

3.2 Descriptive results: Patterns of extreme work hours along the entire ISCO scale

The result of the mapping reveals a clear Europe-wide pattern. Extreme work hours are highly prevalent at the high end of the occupational range (ISCO 100 - 299) as well as at the margins of the outsider segment towards the lower strata of the labour market (ISCO 600 – 699). At the same time, they remain rare in middle range categories (ISCO 400 – 599) and in occupations which require the least amount of skills and knowledge (ISCO 700+). It is the highest skills professionals, such as 'legal professionals', 'medical doctors', 'professional services managers', 'hotel and restaurant managers', 'university and higher education teachers', and the relatively low-skilled workers, such as 'truck and bus drivers', 'street and market salespersons', and 'animal producers' who are most likely to work extreme hours.

Figure 3: The proportion of extreme working hours in 170 occupations in Western Europe in 2013



Note: Category 100: highest skills occupation; Cat 962: lowest skills occupation; Source: EU-LFS, own calculation

The traditional insider segment, including most of the categories from the middle ISCO range, such as 'elementary school teachers', 'administrative secretaries', and 'regulatory government associate professionals' -, as expected, do not exhibit high ratios of extreme work hours. The proportion of extreme work remains under 10% in these occupational categories.

As this paper focuses on the higher strata of the labour market, the examination of the causes and effects of very long work schedules at the margins of the insider and outsider segment (ISCO 600 – 700) is beyond the scope of the analysis. Moreover, to some extent, it has been examined by earlier literature (for example, Wren 2013).

Instead, the novelty of these first descriptive results lies in the detection of a Europe-wide new divide within the well-educated cohort of the labour force. Figure 1 illustrates that there is a large group of occupations in the ISCO range between 100 and 299 in which the long work hours' culture is remarkably widespread. As postulated in the theory section, these are the very occupations where winner-take-all forms of competition is likely to prevail.

3.3 Descriptive results: Cross-national comparison of the size of the winner-take-all segment

By following the methodology outlined in Subsection 3.1, the calculation of the size of the winner-take-all segment in each Western European country suggests the existence of major cross-national variations. Table 2 shows that only a marginal proportion of the Scandinavian workforce is employed in winner-take-all occupational labour markets, while more than 20% of the workforce is employed in winner-take-all occupational labour markets in the United Kingdom, Luxembourg and Switzerland.

The countries in the middle range depict a more mixed picture. Some of the continental European countries that the literature traditionally identifies as the most coordinated political economies with advanced labour representation systems, such as Germany and Austria, exhibit a surprisingly large winner-take-all labour market segment. At the same time, Italy, Spain, and the Netherlands seem to have a labour market structure that looks more like those of the Nordic states from this respect.

This result brings us one step closer to understanding the puzzle around the surprising variation in top income concentration. It seems that coordinated market economies with high top income concentration are precisely those countries which have a large winner-take-all labour market segment.

Table 2: The size of the winner-take-all segment in 2013 in Western European countries

Country	The ratio of workers employed in WTA occupational labor markets in 2013
FI	2%
NO	4%
SE	6%
DK	8%
IE	8%
ES	10%
IT	10%
NL	11%
GR	13%
BE	15%
DE	15%
FR	15%
AT	15%
PT	16%
CH	20%
LU	20%
UK	22%

Source: own calculation from the harmonized EU-LFS surveys;

Note: Percentages are calculated following the methodological choices outlined in Subsection 3.1: a given occupation in each country is identified as a winner-take-all occupational labour market if the proportion of extreme work hours is higher than 20% among its pool of active workers; and if it is a relatively high-skilled occupation, in particular, its ISCO code is between 100 and 399; the size of each countries' winner-take-all labour market segment is calculated as a weighted proportion of winner-take-all occupational labour markets (from the 170 occupational categories); the weighting method is based on ratio of workers employed in each occupation.[4]

4. The association between the size of the winner-take-all segment and top income concentration

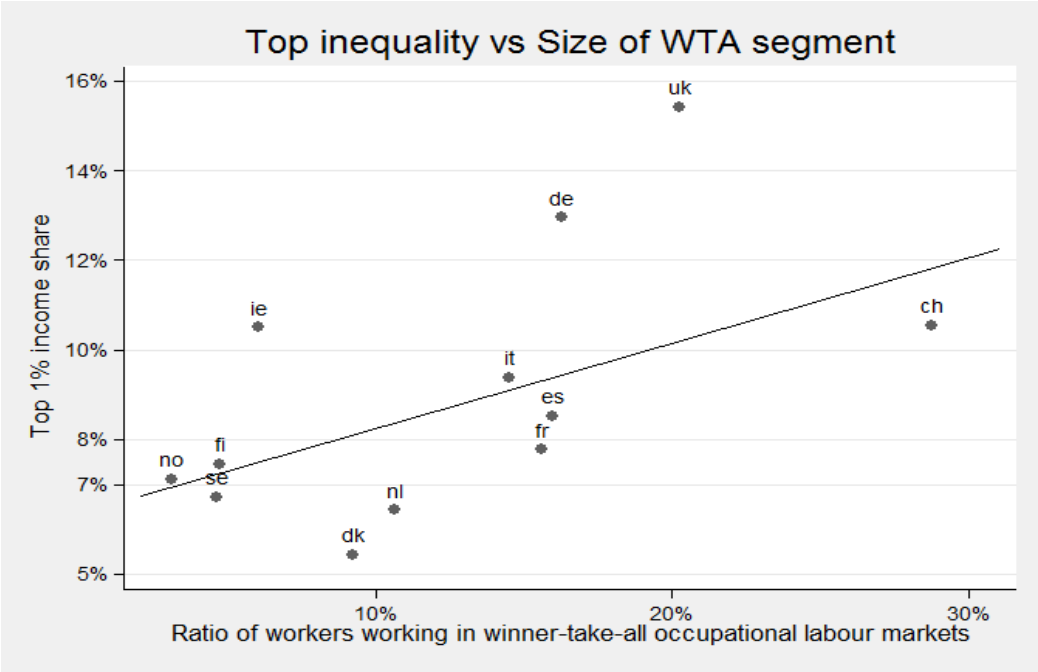
4.1 Macro-correlation

A first look at the correlation between the size of the winner-take-all labour market segment and top income concentration is consistent with our main hypothesis. In countries, where the new segment is relatively large, top income concentration tends to be significantly higher (e.g. in the United Kingdom and Germany). In contrast, in the Nordic countries, where winner-take-all dynamics prevailed only on a marginal number of occupational labour markets, inequality at the top remained relatively low.

Figure 2 illustrates the strong association between the size of the winner-take-all segment and the level of top income concentration in a number of Western European countries in 2009. Countries that are largely permeated by winner-take-all type of occupational labour markets exhibit higher levels of top income concentration than countries in which a relatively large traditional insider segment remained. The result remains qualitatively the same if we look at the association for other years. (All countries are included for which data on the top 1% income share is provided by the Paris School of Economics' database. Portugal is not included in Figure 2 because its last available top 1% income share data is from 2005.)

[4] The results would be unchanged if the chosen thresholds were slightly different. First, expanding the ISCO range that we regard to be relatively high-skilled until the category of 500 or even until 600 would make no difference as there are essentially no occupations in the expanded range where the ratio of extreme work hours is higher than 20%. Second, raising the minimum threshold of the proportion of extreme work hours in the given occupation from 20% to 25% or even 30% would not change the ranking of occupations, thus it would change neither the pattern across the skills groups nor the cross-national results.

Figure 2: Association between the size of the winner-take-all labour market segment (x-axis) and the level of income concentration at the top 1 % (y-axis) in 2009 in Western European countries



Source: The World Wealth and Income Database of the Paris School of Economics (y-axis) and the harmonized EU-LFS surveys; Own calculation

The graph also suggests that there might be varieties of winner-take-all institutional structures in advanced capitalist countries. As expected, the Scandinavian countries are the most equal both in terms of income inequality at the top, as well as in terms of maintaining a large traditional insider labour market segment, which provides secure middle-class employment with a balanced work time schedule for masses of high-skilled workers. This outcome might be partly explained by the radical expansion of public sector employment in the 1970s and 1980s (see e.g. Esping-Andersen 1990). But, except for a small number of occupational labour markets, employment relations seem to be balanced in the private sector as well. It seems right that the gradual adaptation of the labour market policies of the Nordic states (Häusermann and Palier 2008; Kuitto 2011; Kvist 2003) has created an institutional and regulatory environment which successfully hindered the development of winner-take-all labour market structures in the private sector as well.

On the other extreme, the United Kingdom lies at the top right corner of Figure 2, well above the trend line, suggesting that the country's high top income concentration is not only driven by its large winner-take-all labour market segment, but also by direct policy measures that redistribute wealth towards the very highest earners (e.g. the deregulation of CEO compensation rules; the lowering of top marginal income tax rates).

Not surprisingly, the Continental European countries scatter around the middle area of the graph, with the size of their winner-take-all labour market segment ranging from approximately 10% of the workforce to 17%, and with top income concentrations ranging from 8% to 14%. What is perhaps surprising is that Germany stands out as the most unequal Continental European country, both in terms of top income inequality as well as in terms of its labour market structure. This result echoes Fratzscher's (2016) argument on the adverse distributional consequences of Germany's recent economic policies, and, more importantly, it also gives us a hint on why some Continental European countries are more equal at the top than others.

4.2 The size of the winner-take-all labour market segment as a predictor of the Top 1% income share – Regression analysis

To find out if there is a causal relationship between the relative size of the winner-take-all segment and the level of top income concentration, a multivariate regression analysis is conducted. The regression analysis presented in this Subsection considers all theoretically relevant influencers, as proposed by the new wave of top income inequality research.

The results of the regression analysis suggest that the relative size of the winner-take-all labour market segment provides a more consistent explanation for the variation in income inequality at the top than any other political economy explanations considered to date.

Sample and the main dependent and explanatory variables. The sample comprises 13 Western European countries (Sweden, Norway, Denmark, Finland, France, the Netherlands, Italy, Spain, Portugal, Germany, Switzerland, Ireland, and the United Kingdom) for all available years between 1995 and 2013. The sample is restricted to these countries because the World Wealth and Income Database of the Paris School of Economics, where data on the *Top 1% income share* is sourced from, includes exclusively these 13 Western European countries. The time span of the sample is restricted to the years following 1995 because the earliest harmonized EU-LFS surveys, where work time data for the calculation of *The size of the winner-take-all segment* is sourced from, date back to the beginning of the 1990s. 1995 is the first year for which LFS surveys are available for almost all countries, with one exception. For Sweden, the first available harmonized LFS survey is from 1996.

Because of the restriction of the time span to the years following 1995, this sample is more appropriate for the identification of the cross-sectional aspects of the pattern than of those that happened over time. This is partly because the major structural changes in the labour markets of many of these countries had already occurred in the 1980s and the beginning of the 1990s, but also because the sample cover the years of the Global crisis which triggered unexpected temporary changes.

Control variables. The choice of controls is based on the findings of the new wave of studies on top income inequality. First and foremost, a range of direct policy instruments – taxes, fiscal and monetary policies – are identified as direct policy tools with which policy makers can exacerbate or mitigate income inequality at the top of the income distribution (Piketty 2014; Saez et al. 2012). Therefore, *Top marginal income tax rate*, sourced from OECD statistics, is introduced as the first theoretically essential control variable. Theory suggest that the *Top marginal income tax rate* is negatively associated with the level of the *Top 1% income share*.

Since the global crisis of 2007-2009, the financialization and especially the deregulation of the financial sector of advanced economies has been identified as one of the most important factors driving income inequality at the top (Hacker and Pierson 2010; Angeles et al. 2016). To control for the relative size of the financial sector within the overall macroeconomy, the variable *Export in financial services as % of GDP*, sourced from OECD statistics, is introduced. Theory suggest that this variable is positively associated with top income concentration.

Third, the analysis draws on the rich comparative political economy work that identifies different systems of interest reconciliation in advanced Western economies. This body of literature suggests that the way conflict resolution among organised interest groups is organised has a major influence on distributional outcomes (Hall and Gingerich 2009; Rueda and Pontusson 2000; Iversen 1999). To control for the institutional system of interest coordination, a *Coordination index*, sourced from Hall and Gingerich (2009), and the *Union density rate,* sourced from OECD statistics, are included. The *Coordination index* ranges from 0 (lowest coordination system) to 10 (highest coordination system). To avoid potential collinearity problems, these two variables are included only in separate model specifications. Theory suggests that both variables are negatively associated with the level of top income concentration.

Fourth, a list of economic variables is included to control for the possibility that business cycles are driving some of the trend in the distribution of top incomes. First, *GDP growth rate* and *Unemployment rate*, both sourced from OECD statistics, are included to control for the possibility that the short-term economic fluctuations are driving some of the changes in the distribution of top incomes. At the same time, the log of real *GDP per capita*, sourced from OECD statistics, is also included to test whether top income inequality is higher in richer countries than in others.

Estimation techniques. In the first eight specifications of the model, pooled cross-section OLS estimation method is used, which enables the comparison of the labour market structure of various national employment systems. In the last two model specifications, fixed-effects panel methods are

used to test whether the associations between the explanatory variables and the top 1% income share hold over time (between 1995 and 2013) *within* the countries included in the sample.

Estimation results. As Table 3 shows, the relative size of the winner-take-all labour market segment is a strong and significant determinant of the variation in top income concentration among Western European countries. Overall, its explanatory power is stronger than any other influencing factors considered by the political economy literature to date. The magnitude of the positive effect is stable even when all theoretically important control variables are introduced.

Results relating to the control variables confirm prior expectations: Income inequality at the top is negatively affected by high top marginal income rates; positively affected by the level of financialisation; while more coordination in industrial relations leads to lower levels of income inequality at the top. Business cycles do not seem to explain the variation in income inequality at the top.

When country fixed effects are introduced (9^{th} model specification), the coefficient of the main explanatory variable, the *Size of the winner-take-all segment*, falls in magnitude and loses its statistical significance. This suggests that changes in the size of the winner-take-all segment does not strongly affect top income concentration within the same country in the short term. This means that the strong effect estimated in the pooled cross-section regressions (specifications 1 to 8) is mainly identified from the cross-section dimension of the panel. Thus, it can be interpreted as the long-term effect of the extent of the winner-take-all segment on top income concentration.

The last model specification shows that the link between the size of the winner-take-all segment of the labour market and the top-level income inequality holds in Southern European countries even when we concentrate only on the longitudinal aspect and blend out the cross-national aspects by country fixed effects. Italy, Spain, and Portugal seem to exhibit a development pattern in which a gradual expansion of their winner-take-all labour market segment went in parallel with the rise in top income inequality since the mid-1990s. In other groups of countries, these developments seem to have happened less synchronously.

Overall, the regression results suggest that the extent to which high-skilled labour markets are segmented into a winner-take-all- and a traditional insider labour market segment explains a significant amount of the cross-national variation in top income concentration in Western European countries. It also explains a significant amount of the longitudinal variation in three Southern European countries.

Table 3: The determinants of the top 1% income share – OLS regressions

Determinants of top 1% income share										
	OLS(1)	OLS(2)	OLS(3)	OLS(4)	OLS(5)	OLS(6)	OLS(7)	OLS(8)	OLS(9)	OLS(10)
Variables	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share	Top 1% income share
Size of the winner-take-all labour market segment	**0.190*** **	**0.172*** **	**0.149*** **	**0.140*** **	**0.135*** **	**0.127*** **	**0.128*** **	**0.177*** **	**0.013**	**0.031** **
	(0.021)	(0.021)	(0.024)	(0.024)	(0.029)	(0.026)	(0.025)	(0.028)	(0.025)	(0.013)
Top marginal income tax rate		-0.068***	-0.038**	-0.038**	-0.042**	-0.037**	-0.039**	-0.082***	0.004	-0.002
		(0.016)	(0.017)	(0.017)	(0.019)	(0.017)	(0.017)	(0.020)	(0.011)	(0.015)
Export in financial services as % of GDP			0.386**	0.186	0.388**	0.363*	0.325	1.140***	0.215	-1.960***
			(0.163)	(0.181)	(0.168)	(0.213)	(0.213)	(0.242)	(0.211)	(0.500)
Union density					0.006			0.008		
					(0.009)			(0.008)		
Coordination index - Hall and Gingerich				-0.017**		-0.013*	-0.016**	0.008		
				(0.007)		(0.007)	(0.007)	(0.008)		
Log of GDP per capita						-0.722	-0.740	-0.166	5.539***	4.690***
						(0.456)	(0.454)	(0.543)	(0.972)	(0.697)
GDP growth rate							-0.079	-0.061		0.020
							(0.048)	(0.048)		(0.018)
Unemployment rate								0.022		
								(0.043)		
Constant	6.351***	9.878***	8.581***	9.848***	8.889***	17.371***	17.981***	11.165*	-50.532***	-39.250***
	(0.304)	(0.891)	(0.911)	(1.046)	(1.108)	(4.865)	(4.858)	(5.840)	(10.260)	(7.577)
Observations	206	199	187	187	170	187	187	157	187	42
R-squared	0.297	0.378	0.385	0.404	0.342	0.412	0.420	0.533	0.306	0.758
Number of country_id									13	3
Estimation method	Pooled cross-section OLS								Fixed-effects panel	
Countries in the sample	13	13	13	13	13	13	13	13	13	Italy, Spain, Portugal
Standard errors in parentheses										
*** p<0.01, ** p<0.05, * p<0.1										

5. Conclusion

This paper brings us one step closer to understanding the variation in top income inequality in Western European countries. Contrary to earlier literature, it argues that explaining the rise and variation in winner-take-all inequality requires a political economy perspective that embraces the notion that labour market structures are crucial intermediating channels between economic pressures, public policy and distributional outcomes.

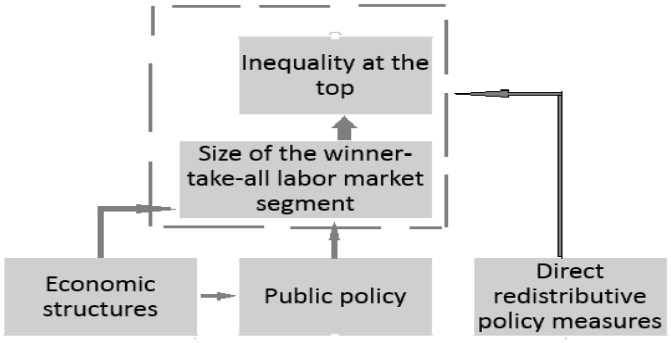
To explain the variation in top income inequality, the paper proposes a new labour market typology, based on theories of labour market segmentation. Besides the outsider and the insider labour market segment, as conceptualised by the dualism literature, the new typology identifies the existence of a winner-take-all segment in the post-industrial labour markets of advanced democracies. It is argued, both theoretically and empirically, that the relative size of the winner-take-all labour market segment is an important explanation for the variation in top income inequality across Western European countries.

Certainly, as the first pieces of the new wave of research on top income concentration suggest, direct redistributive policies play an important role in shaping the distribution of income at the top. The most explicit of these includes tax-cuts for the highest earners (Saez et al. 2012), while less explicit ways in which policy makers can influence the level of top income concentration include reforms of the collective bargaining system, through which unions might represent a counterweight to economic and political power at the top; changes in the regulation of CEO compensation; and the deregulation of the financial sector (Hacker and Pierson 2010; Angeles et al. 2016).

However, what has not been emphasised by earlier literature is the explicit consideration of the notion that most of the political and economy factors exert their effect only indirectly, through influencing the structure of the intermediating channel, the labour market.

The next graph illustrates the main mechanisms that seem to be at work: beyond direct redistributive policy measures, all other initial influencing factors exert their distributive effects through shaping the structure of the labour market, or more precisely, through influencing the size of the winner-take-all segment. The dashed line outlines the focus of interest of this paper: the relationship between the size of the winner-take-all segment and the level of top income concentration.

Figure 3.



By estimating a series of pooled cross-section OLS regressions and fixed-effects panel regressions, the paper shows that the extent to which high-skilled labour markets are segmented into a winner-take-all-, and a traditional insider labour market segment, explains a significant amount of the variation in top income concentration among Western European countries.

Overall, this piece of research should be regarded as a call for a new research agenda. Political economy research on top income inequality should rely more extensively on the examination of the functioning and structure of the labour market. Post-industrialism has restructured labour markets in a profound way, giving rise to a qualitatively different high-skilled labour market segment, the winner-take-all segment, in which the constellation of weak labour representation and extensive competitive pressures gives rise to unprecedented inequalities between a few successful managers and the rest of the labourers. The significance of this new phenomenon could be argued about, but it seems difficult to argue against its very existence.

Finally, it's worth mentioning that even though the empirical results of the paper provide a first corroboration to the theoretical proposition that the rise in top income concentration is deeply rooted in fundamental changes in labour market structures, further research might be needed to check the robustness of the results. For example, future empirical inquiries could use alternative indicators for measuring the size of the winner-take-all segment. Finding alternative methods which focus on the identification of the longitudinal trends, dating back to the 1880s, might be a logical next step in the continuation of the research agenda.

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