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# The Minimum Wage, Decent Wages, and Time Sovereignty in the European Union

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# The Minimum Wage, Decent Wages, and Time Sovereignty in the European Union

## **Abstract**

The minimum wage is a legally mandated relationship between money and time. Traditionally, studies of the minimum wage have focused on the money side of this relationship (e.g. how much do minimum wage workers earn) while ignoring its temporal aspects (e.g. how long someone has to work to receive a particular income). This is a significant oversight because it overlooks the temporal investments that minimum wage workers must make in order to achieve a specific sum of money (e.g. there is a significant temporal difference if a minimum wage worker can achieve an income above a poverty threshold by working part-time, full-time, or more than full-time). To address this oversight, we calculate the number of hours individuals and families earning the minimum wage would have to work in order to achieve the poverty-level income in the 20 European Union countries with national statutory minimum wages. Our findings show two things. One is that there are significant differences between how long minimum wage workers must work in order to achieve these income thresholds. The other is that while in some countries this amount is relatively stable over time, in others it can vary considerably.

## **Keywords**

minimum wage, European Union, time, working time, hours, economic sociology, volatility, decent wage

## **Disciplines**

Eastern European Studies | Economic Policy | Economics | Inequality and Stratification | Social Welfare | Work, Economy and Organizations

**Sociology Honors Thesis**  
**The Minimum Wage, Decent Wages, and Time Sovereignty in the European Union**

*Abstract.* The minimum wage is a legally mandated relationship between money and time. Traditionally, studies of the minimum wage have focused on the money side of this relationship (e.g. how much do minimum wage workers earn) while ignoring its temporal aspects (e.g. how long someone has to work to receive a particular income). This is a significant oversight because it overlooks the temporal investments that minimum wage workers must make in order to achieve a specific sum of money (e.g. there is a significant temporal difference if a minimum wage worker can achieve an income above a poverty threshold by working part-time, full-time, or more than full-time). To address this oversight, we calculate the number of hours individuals and families earning the minimum wage would have to work in order to achieve the poverty-level income in the 20 European Union countries with national statutory minimum wages. Our findings show two things. One is that there are significant differences between how long minimum wage workers must work in order to achieve these income thresholds. The other is that while in some countries this amount is relatively stable over time, in others it can vary considerably.

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***Introduction***

The purpose of the minimum wage in the countries of the European Union (EU) is threefold: to ensure that workers at the low end of the earnings distribution receive a “decent” or “living wage” that will reduce both poverty and wage inequality, to “curb exploitation of vulnerable workers,” and to reduce unemployment by being an incentive to work (European Foundation for the Improvement of Living and Working Conditions 2007). In fact, Schulten (2008:421) notes that “the notion of Social Europe is usually taken to entail the payment of fair wages, defined as at least a minimum sufficient for a decent standard of living.”

In addition to protecting workers’ right to adequate financial resources, the EU is also concerned with the protection of workers’ time. These goals were outlined in detail in a 2003 publication of the European Foundation for the Improvement of Living and Working Conditions (EuroFound), “A New Organization of Time over Working Life.” This publication identifies income and social security, work/life balance, and time sovereignty as three important factors that contribute to a worker's quality of life. EuroFound (2003: 55-6) defines work/life balance as “an individual's attempt to find suitable time arrangements and time options that allow the best possible coordination of requirements of work with time requirements for personal life.” In other words, a worker should have time outside of work, as well as control over that time, to allocate to the social and personal activities that he or she wishes. This concept is further described in the concept of time sovereignty which EuroFound (2003:58) defines as “the right and ability of individuals to determine time allocation to a large extent (quantitatively as well as qualitatively) throughout their whole life and in all fields of life, not just in working life.” Time sovereignty is seen as being crucial to workers' quality of life and is a “central point of reference for planning life flexibility in a dynamic society.” Thus, the EU posits free time, and the ability to control that free time, as crucial to having a decent standard of living.

Given the above, the EU seems to espouse twin goals for the minimum wage: to provide workers a decent wage while also allowing them adequate time sovereignty. The ability to accomplish both of these goals is seen by the EU as indicating a good quality of life. As such, the governing body of the EU has determined in their vision of "Social Europe" that workers will be able to achieve material prosperity (i.e. a "decent wage") while still having free time to dedicate to social and personal activities (i.e. time sovereignty). While there is considerable variation in the wealth of the EU (e.g. annual median incomes for a single person as high as €31,635 in Luxembourg and as low as €1,883 in Romania), since the EU holds these twin goals up as rights they should be attainable for all workers across the EU, regardless of the relative economic situation of their home country. One goal of this project is to determine if minimum wage workers can actually meet those twin goals given both legal and natural limits on their working time.

### *Research Questions*

The primary research question I wish to explore is:

**RQ1: Given that the Charter of Fundamental Rights of the European Union protects workers' rights to both material prosperity and temporal sovereignty, is the fulfillment of both of these goals possible for minimum wage workers in practice?**

Are minimum wage workers in the EU actually able to both earn a decent living and have time to devote to issues outside of work, or must one be sacrificed in order for the other to be achieved? For the purposes of this study, the income threshold that I will use is the poverty threshold because it is the minimum threshold at which workers in the EU should be able to fulfill both of the twin goals, i.e. it is the minimally acceptable income for achievement of material prosperity. If minimum wage workers cannot meet this threshold they are not meeting the measure of a decent standard of living and thus are unable to fulfill at least one of the twin goals. The second of these twin goals, time sovereignty, I define as the situation

where a minimum wage worker must work any more than one full-time job to meet this minimum standard of living.

In addition to the above, I will also explore whether workers' ability to reach the given thresholds changes over time. Some change over time is expected given that increases in the minimum wage are sometimes infrequent and may not necessarily keep pace with inflation. However, it is important to understand whether this change over time negatively impacts a worker's ability to fulfill the twin goals of minimal material prosperity and time sovereignty. This informs my second research question:

**RQ2: Is there significant change over time in the number of hours necessary to meet the minimum standard of a decent life?**

This question will allow me to determine the current situation of minimum wage workers in the EU, whether those workers can actually meet the EU's twin goals, and what that relationship has looked like over time. This may provide insight into the future ability of minimum wage workers to meet those goals as well as whether the current situation is tenable or not. Minimum wage workers in the EU should be able to meet the twin goals from year to year. If this is not the case, i.e. if their ability to earn the poverty threshold is negatively impacted by the fluctuating value of the minimum wage, this is a problem.

### ***Literature Review***

There is a long tradition within the field of sociology that argues for the importance of time. Fundamental to this tradition are the theories of Karl Marx who used the importance of time to problematize capitalism as an economic system. Two aspects of Marxist theory in particular inform this project: first, that the material realities of work, of which time is an essential factor, are important, and second, that if allowed to operate unregulated or disembodied from society, the market will devour workers' time in its unending quest to increase surplus-value.

At the root of Marx's theory is his materialist conception of history, i.e. that "the premises from which we begin are not arbitrary ones, not dogmas, but real premises from which abstraction can only be made in the imagination. They are the *real* individuals, their activity and material conditions under which they live, both those which they find already existing and those produced by their activity" (Marx & Kamenka 1983:163, emphasis added). In other words, unlike classical economists who speak of profit and commodities in an abstract manner, Marx emphasizes how these economic factors are the result of real people performing real work under a specific set of social conditions, one of which is working time. In *Capital*, Marx further stresses the material aspect of the labor process by asserting that "labor is, first of all, a process between man and nature...he confronts the materials of nature as a force of nature. He sets in motion the natural forces which belong to his own body, his arms, legs, head and hands, in order to appropriate the materials of nature in a form adapted to his own needs" (1867:283-4). For Marx, work is not an abstract process disassociated from actual human experience; instead, it is the result of quite real people engaging in the material world.

Time is a particularly important aspect of the labor process for Marx. In fact, he dedicates an entire chapter of *Capital* to a discussion of the working day and working hours.<sup>1</sup> In general terms, for Marx time is the medium through which we develop our species being. As he puts it, "Time is the room of human development. A man who has no free time to dispose of, whose whole lifetime apart from the mere physical interruptions by sleep, meals, and so forth, is absorbed by his labor for the capitalist, is less than a beast of burden. He is a mere machine for producing Foreign Wealth, broken in body and brutalized in mind" (Marx & Kamenka 1983:422). Without time for development, humans are reduced to the level of

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<sup>1</sup> As will be seen below, time is also a crucial factor in Marx's conception of surplus value/exploitation. Surplus value can only be generated if workers labor for longer than is necessary to reproduce their labor costs.

machines. Thus, for Marx time is something that must be protected in order that it can be dedicated to our development.

Under the capitalist system, the protection of workers' time becomes necessary because of capitalism's "voracious appetite for surplus labor" and surplus-value, i.e. the value a worker produces additional to what is necessary to pay his or her wages (Marx 1867:344). In *Capital*, Marx states that, "capital has one sole driving force, the drive to valorize itself, to create surplus-value, to make its constant part, the means of production, absorb the greatest possible amount of surplus labour. Capital is dead labour which, vampire-like, lives only by sucking living labour, and lives the more, the more labour it sucks...the capitalist appetite for surplus labour appears in the drive for an unlimited extension of the working day" (1867:342, 346). That is, when the capitalist system is left to self-regulate and proceed unhindered, the result is the total consumption of a worker's time in its incessant effort to maximize surplus-value. Marx argues that eventually, the capitalist will consume so much of workers' time that they will not have sufficient time to 'recharge' before the next working shift, resulting not only in the degradation of their labor but also the loss of their humanity.

In support of Marx's theory regarding the importance of the relationship between working time and degradation of the worker, a number of studies have shown that increased working time, especially excessive overtime (defined as any overtime that exceeds the maximum 48 hour work week) is related to a host of negative physical, psychological, ecological, and productive side effects (Freyssinet & Michon 2003). Seo (2011:4) states that "it is empirically proven that a work week of over 50 hours is detrimental to health" and that "adequate leisure (non-work) time is necessary for the wellbeing of workers." Spurgeon (2003) found that working for more than 50 hours per week increases the risk of mental health problems, cardiovascular disease, musculoskeletal disorders, and "health-threatening coping behaviors" like smoking and a poor diet. In their analysis, Wirtz and Nachreiner (2010:1128-



29) found that ailments such as "sleep problems, stomach ache, or irritability" increased with longer working hours and work at unusual times. Additionally, Wirtz and Nachreiner (2010:1129) show that "the more hours one works and the more often working time is located at unfavorable times, the more work-life balance deteriorates." This is an important finding in that it demonstrates that longer working hours not only have negative effects on worker health, which affects quality of life in obvious ways, but also negatively impacts both work/life balance and time sovereignty.

Writing nearly a century after Marx, Karl Polanyi (1944) also argued for the importance of working time and recognized the same concerns regarding capitalism's propensity to usurp that time thereby degrading workers' humanity. But unlike Marx, Polanyi saw the market as something that could be tamed and controlled by society. For Polanyi, the ideal situation is one in which "the economic system is, in effect, a mere function of social organization" (Polanyi 1944:52). In other words, for Polanyi it is imperative that society regulates the economic system in order to protect itself from the ravages of a market society. If a society fails to do this, Polanyi believes that this will usher in waves upon waves of what he calls "social dislocations" that will ultimately destroy society itself (e.g. the corruption of land, labor, and money through the elimination of protective working legislation, destruction of and disregard for the environment in the pursuit of capital, etc.). Rather than focusing on the effects of a long working day, then, Polanyi decried the volatility of the market and we can see drastic changes in working time as one type of social dislocation. In reaction to these social dislocations, society attempts to protect itself with legislation, much like the EU has done.

The European Union recognizes the need to protect a worker's time from the ravages of the free market and as a result have attempted to embed the market within society. Towards this end, the EU has established supranational legal limits on working time (Minimum Wages

in Europe: Background Paper 2007). Directive 2003/88/EC published in November 2003 establishes workers' rights to daily and weekly rest periods, minimum annual leave of four weeks, maximum weekly working time of 48 hours, and protection from unnecessary or unduly long periods of night work (Official Journal of the EU 2003). These legal measures are designed to retain society's control over the market and in doing so protect workers from its voracious appetite for their time.

It is through the lens of these theories that we can view the relationship between working time and the minimum wage in the European Union. If this study does in fact reveal that minimum wage workers must spend unreasonable or large parts of the day working simply to reach the baseline of a decent living (i.e. the poverty threshold), they are not afforded space for human development. More importantly, this would mean that these countries are failing to meet the twin goals of a decent living and time sovereignty which the EU valorizes in supranational legislation and theory.

As we have seen, the issue of working time is and has been an important subject for sociological theorists nearly as long as the discipline has existed. However, when surveying the literature on the minimum wage we find that the issue of time has largely been ignored in favor of one of three themes: the minimum wage's effects on unemployment, its effect on wage inequality and poverty, and its importance as part of the vision of Social Europe. Given their importance to the minimum wage literature, it is worth exploring these themes in detail.

### *Unemployment Effects*

The most common focus of studies surrounding the minimum wage in the European Union is the effect that it has on unemployment. While a number of these studies note that the textbook economic view of the minimum wage is that it leads to increased unemployment (Mixon 1978:67; Dolado et al. 1996:320; Machin & Manning 1997:734; Stewart 2004:C10;

Pedace & Rohn 2011:57), most have actually found little to no effect of the minimum wage on employment, positive or negative. Dolado et al. (1996:320) is one widely cited example of research whose aim was to “assess the effect of minimum wages in Europe, cutting through the emotive positions of proponents and opponents to offer a more balanced assessment of its impact in different countries.” The authors examined the impact of the minimum wage on employment and the Kaitz index in four representative countries: France, the Netherlands, Spain, and the UK. This study concludes that “it is surprisingly hard to find strong evidence of any adverse employment effects of minimum wages in situations where many commentators are firmly convinced (rightly or wrongly) that the job losses exist” (Dolado et al. 1996:357). In a similar study published the following year, Machin & Manning (1997) examined the effects of the minimum wage on both unemployment and wage distribution. Studying the same four countries as Dolado et al. (1996), Machin & Manning (1997:741) similarly conclude that there is “little evidence that minimum wages have a bad effect on jobs.” Providing further support for the seemingly insignificant effect of the minimum wage on employment is Stewart (2004:C116) whose study of the employment effects of the introduction of the national minimum wage in the UK yielded that “no significant adverse effect on employment is found for either the introduction or the upratings for any of the demographic groups considered.”<sup>2</sup> A more recent study undertaken by Metcalf (2008:489) attempts to explain why the minimum wage in the UK has “raised the real and relative pay of low wage workers, narrowed the gender pay gap and now covers around 1-worker-in-10” but has provided “little or no evidence of any employment effects.” He concludes by affirming that his own study supports the conclusions of previous studies regarding the nil impact on employment. It is interesting to note that the UK National Minimum Wage Low Pay Commission Report (2012:55) finds that the national minimum wage has actually had a

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<sup>2</sup> It is important to note that because it provided a natural experiment of minimum wage effects, the majority of European minimum wage studies have focused on the UK. There are very few studies that focus on the EU as a whole, so this study will also contribute to that literature.

positive impact on employment; that “employment rates of many of the groups expected to be most affected by the minimum wage have increased since its introduction.” However, in a subsequent review of the research, the report notes that “the general consensus of the research is that the NMW has not significantly affected employment” (Low Pay Commission Report 2012:56).

### *Inequality and Poverty Effects*

A second common theme addressed by the literature is the effect of the minimum wage on wage and social inequality and poverty in the European Union. In a summary of the effect of the minimum wage on the incidence of low pay in the EU, the European Commission’s 2010 Industrial Relations in Europe Report (2010:144) found that the minimum wage has shown a declining ability to impact the incidence of low pay. The report states that “the countries with the highest level of low pay all have a statutory minimum wage” and that “in over half of the countries concerned, the statutory minimum wage lost value compared to the average wage during the 2000s” suggesting a “declining capacity to prevent low pay from emerging.” A similar conclusion was reached by Manning & Dickens (2002:50) who determined that as a result of the weaknesses in statistics of hourly pay in the UK, “there remains very considerable uncertainty about the true impact of the NMW.” This is interesting given that other studies, including the 2012 National Minimum Wage Low Pay Commission Report of the UK, have found that the minimum wage does have a significant positive impact on the incidence of low pay and wage dispersion (Machin & Manning 1997:741; Machin et al. 2003:154; Lucifora et al. 2005:289; Dickens & Manning 2004:624; Metcalf 2008:492, Fanti & Gori 2011).

Machin & Manning (1997:741) argue that based on their study of the economic effects of the minimum wage in France, the Netherlands, Spain, and the UK, minimum wages “have

an equalizing impact on the distribution of income among families with someone in work.” However, they note the difficulty in obtaining accurate statistics and of comparing effects across a range of countries (Machin & Manning 1997:741). Similarly, in a review of low pay in Europe, Lucifora et al. (2005:289) show that wage regulations like the minimum wage “have a significant impact on low-wage employment” and that “high minimum wages lower dispersion at the bottom end of the distribution.” Machin et al. (2003:154) duplicate these results but in a much smaller setting, that of low paid workers in the residential care home industry. The results of this study suggest that “the minimum wage raised the wages of a large number of care home workers, causing a very big wage compression of the lower end of the wage distribution, thereby strongly reducing wage inequality.” Fanti & Gori (2011:81) reach the same conclusion in their study of the impact of the minimum wage on overall economic growth.

In contrast, Dickens & Manning (2004:624) found that although the minimum wage “has been effective in raising the earnings of the lowest paid workers” in the UK, the overall effect is small, “with no detectable effect on earnings at the 10th percentile even when the effect of the NMW was largest.” As is apparent from studies of the minimum wage effect on both employment and wage inequality, various studies have found support for both the defending and opposing side of the argument, and in the words of Manning & Dickens (2002:50), “the honest conclusion is that there remains very considerable uncertainty about the true impact of the NMW.”

### *Vision of Social Europe*

Another theme present in European minimum wage literature is that of the role of the minimum wage in the realization of the “Vision of Social Europe” (Schulten et al. 2005; Schulten & Watt 2007:1; Schulten 2008:422; Levin-Waldman 2003:487; European

Commission 2010:3). The concept of “Social Europe” refers to the idea that “the European Union is founded on the principle of social rights advancing alongside economic growth and sustainable development. EU Member States share common values, which together make Europe a unique model of society in the global context” (European Trade Union Federation 2007). Thorsten Schulten has emerged as the primary contributor to this branch of the literature with his argument that the creation of a European minimum wage is important not only to “lend substance to the idea of a ‘Social Europe,’” but also to “help to reverse the increasing loss of trust and legitimacy in the EU among growing sections of European labor” (Schulten & Watt 2007:1). Schulten & Watt (2007:5) argue that given the commitment of the EU to promoting “fair and equitable wages” for all workers, an EU level minimum wage is the best way to promote Social Europe as well as “one way to avoid a potential ‘race to the bottom’ or beggary-thy-neighbour approach” in the area of migration and social dumping in the EU. The authors further argue that EU countries should “have the goal of implementing a framework in which national minimum wages would be protected from erosion and the lowest-paid workers in each European country assured a decent standard of living and their societies a minimum of social cohesion” (Schulten & Watt 2007:8). Schulten (2008:421) represents a more detailed development of the argument set forth in Schulten & Watt (2007) for a “coordinated minimum wage policy at European level.” Further argument for the importance of the minimum wage in a development of Social Europe can be found in Levin-Waldman (2003). While this paper is not directed specifically at the European Union, the author argues in favor of the minimum wage because it “furthers the ends of democratic society” (Levin-Waldman 2003:488). Levin-Waldman (2003: 488-9) proposes that “the minimum wage is not just a matter of increasing the purchasing power of those at the bottom; it is also about what constitutes a fair and just society” and towards that end it serves the very goals that Social Europe stands for: “that low-wage workers may achieve greater equality of

standing with their peers to the extent that income inequality is at all lessened; their autonomy as individuals is enhanced through higher wages, which in turn enables them to claim the benefits of citizenship and participate more effectively in the democratic process; it fosters greater economic development in that it raises the overall wage structure of a region and perhaps the productivity of that region.”

As can be seen from the above, the issue of time is largely ignored by most of the minimum wage literature. The exceptions to this are some authors who have addressed the minimum wage's effects on working time. However, what is notable about these works is that they focus on the issue of time primarily from the perspective of employers. For example, although Metcalf (2008) does discuss briefly a reduction in hours worked as a result of the introduction of the national minimum wage, this is from the perspective of the employer, not workers themselves. Robinson & Wadsworth (2007:553) found in their study of the introduction of the minimum wage in the UK that “there is little evidence to suggest that the extra pay provided by the introduction of the minimum wage was sufficient to affect the incidence of second job holding significantly.” Unlike previous studies, the authors do address the issue of work hours from the perspective of the worker and conclude that “while hours of work may have fallen in second jobs..., hours of work in the main job have, if anything, risen for those affected by the NMW” (Robinson & Wadsworth 2007:569). So while there have been studies that address working time, there has been no significant scholarship regarding the number of hours minimum wage workers must work in order to achieve various income thresholds.

Given the amount and variety of literature surrounding minimum wage policy in the European Union and the importance that EU labor policy accords to workers' time, it is striking that there is virtually no literature that addresses the relationship between the minimum wage and the time needed to achieve certain income thresholds in the EU. This

study will attempt to address this gap in the literature. This is important because while there is considerable scholarship addressing the impact of the minimum wage on macro-economic variables, there is a lack of literature that examines the effects of the minimum wage on workers. Also, the existing literature focuses primarily on just a few countries, specifically the UK, Spain, France, and the Netherlands, and there is little written about the EU as a whole. This study will also help us get a broader sense of minimum wage work in the EU.

### ***Methods***

To address the aforementioned research questions, I focus on the 20 countries in the EU that have national statutory minimum wages, i.e. minimum wages that are set at the state level and that apply to all sectors of the economy. This includes: Belgium, Bulgaria, the Czech Republic, Estonia, France, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and the United Kingdom. Countries where the minimum wage is primarily determined by collective bargaining are excluded from this study. The following data was collected for each of the 20 EU countries with national statutory minimum wages over the period of 1999-2011: monthly minimum wage levels and poverty thresholds for single worker and four person family units (Eurostat Population and Social Conditions database), minimum wage and working time legislation (European Foundation for the Improvement of Living and Working Conditions and United States Department of State Country Reports), and legally mandated vacation time (OECD and International Labor Organization databases).

In order to answer RQ1, data for each country's minimum wage was collected from Eurostat, the statistical organ of the EU. Since the minimum wage is given as a monthly measurement, it was converted to an hourly measure. This was necessary in order to determine the number of working hours necessary per week to achieve the poverty threshold.



The EU sets the standard workweek at 40 hours, but within the 20 countries studied some have shorter standard workweeks (e.g. the standard workweek in Belgium is 38 hours), so the monthly minimum wage was converted to an hourly wage using the standard workweek for each country. To do this, each monthly minimum wage figure was divided by the legally defined standard number of monthly working hours in order to determine the hourly wage.

Below is an example calculation:

**Ex. 1: Hourly Minimum Wage, Belgium 2011:**

38 hour standard workweek \* 4 weeks/month = 152 hours/month

€1415.24 monthly minimum wage/152 hours/month = €9.31/hour

A standard measure of the poverty threshold in euros was collected from Eurostat for each country as well. For this study, I have chosen to focus specifically on the single worker and the four person family with two workers and two dependent children. These were chosen in part because they are two common worker units that the EU uses to measure various figures including poverty thresholds and minimum wages. Additionally, examining these working units will give us a sense of whether the minimum wage provides a minimally decent standard of living for both single people and families.

The hourly minimum wage figures and the poverty thresholds were then used to calculate the number of hours that each minimum wage-earning working unit must work per week in order to achieve the poverty threshold. This number assumes a 48 hour workweek year, but this is not standard across all countries. To adjust for this we included an adjustment for the mandatory paid vacation time provided for in EU labor laws. Since our aim is to determine the actual number of necessary working hours, i.e. the number of hours a worker must spend working to achieve the poverty threshold, it was necessary to factor in paid vacation time when workers would be earning income but not actually working. The EU mandates that all workers are entitled to a minimum of 20 days (4 weeks) of paid vacation time per year. Our basic calculation assumes 20 days of paid vacation and a 48 workweek

year, but some countries require more paid vacation, e.g. France where the standard paid vacation time is 41 calendar days, and this was accounted for by changing the number of mandatory yearly vacation hours as used in the example equation below. Vacation time data was collected from the International Labor Organization. The basic calculation for this involves first dividing the poverty threshold by the minimum wage to determine the total number of hours necessary to earn that threshold in one year. The total number of hours is then adjusted for vacation time by subtracting the mandatory vacation time as measured in hours. This figure is then divided by the total legal number of workweeks allowed by each country's labor laws based on mandatory vacation time in order to determine how many hours per week the worker must average in order to achieve the poverty threshold. The following is a sample calculation:

**Ex. 2: Total Hours Worked for Single Worker Poverty Threshold: Belgium 2011**  
 $\text{€}12,005.00 \text{ poverty threshold} / \text{€}9.31 \text{ hourly minimum wage} = 1289.47 \text{ hours per year}$   
 $(1289.47 \text{ yearly hours} - 240 \text{ mandatory yearly vacation hours}) / 46 \text{ standard yearly work weeks} = 22.81 \text{ hours worked per week}$

In order to answer RQ2, the above calculations were performed for each country over the period of 1999-2011, where data was available, and the results were used to examine change over time. In order to do this, volatility was chosen as the measure of change. The volatility of the number of weekly hours worked to achieve a given threshold was determined by taking the standard deviation of the number of hours over the given period. This figure allows us to determine by how many hours the number of hours necessary to achieve the poverty threshold fluctuated from year to year over the given time period. Understanding the magnitude of this fluctuation helps us to determine whether the change in necessary hours worked from year to year negatively impacts the ability of a minimum wage worker to earn the poverty threshold and thus fulfill the EU's twin goals.

## ***Results***

### *Is fulfillment of both a decent standard of living and time sovereignty possible?*

The poverty threshold represents the minimum amount of income at which a worker can be said to have an acceptable standard of living. Are minimum wage workers in the EU able to achieve this income without jeopardizing their time sovereignty? The calculations to determine total number of hours necessary to achieve the poverty threshold were performed for both a single worker unit and a four person family unit comprised of two workers and two dependent children. In order to contextualize the number of weekly working hours they were converted to the corresponding number of standard 40-hour workweeks. This means, for example, that 1.0 corresponds to 40 hours while .5 corresponds to 20 hours, etc.

As can be seen from Table 1, there is significant variation between countries regarding the number of hours minimum wage workers must work to achieve the poverty threshold. To help contextualize these numbers, I divide these countries into three groups based on their relationship to achievement of the twin goals. The first group - Group 1 - is defined as less than .75 full-time jobs, or 30 hours, for a single worker and less than 1.5 full-time jobs, or 60 hours, for a four person family. I label this category as "reasonable" in the sense that it includes countries in which achievement of the poverty threshold is not only possible within the confines of the standard 40 hour workweek, and thus does not require workers to violate their time sovereignty, but also leaves workers sufficient time where they can increase either their material prosperity (by working more) or their time sovereignty (by devoting their efforts to non-work issues). Workers can do either of these without jeopardizing either of the EU's twin goals. In other words, not only can workers in this group accomplish the EU's twin goals, but they also have a significant time 'buffer' which allows them to increase the time they devote to one of these goals without violating the other (e.g. if a worker can achieve the poverty threshold in 20 hours, this leaves him/her 20 hours of the standard workweek that can

be devoted either to increasing his/her income or sovereignty without his/her material prosperity or time sovereignty being violated).

The second group - Group 2 – is defined as between .75 and 1 full-time jobs, or between 30 and 40 hours, for a single worker and between 1.5 and 2 full-time jobs, or between 60 and 80 hours, for a four person family, this leaves these workers less than 10 hours per week with which to either increase their material prosperity . This group can be considered "precarious" because it includes countries in which it is possible to achieve the poverty threshold but where workers have very little ability to improve their situation in terms of one of the twin goals (i.e. to increase their material prosperity or time sovereignty) without sacrificing the other goal. This group is quantitatively defined as working between .75 and 1 full-time job, or between 30 and 40 hours, for a single worker and between 1.75 and 2 full-time jobs, or between 70 and 80 hours, for a four person family, this leaves these workers less than 10 hours per week with which to either increase their material prosperity or expand their time sovereignty. If a worker in this category desired to increase either one of the twin goals, he or she would be forced to sacrifice the other.

The third group - Group 3 - is seen as being "unreasonable" because it includes countries in which the simultaneous achievement of the twin goals is not possible. This group is quantitatively defined as greater than 1 full-time job, or 40 hours, for a single worker and greater than 2 full-time jobs, or 80 hours, for a four person family. Minimum wage workers in these countries are forced to sacrifice both twin goals because they do not have sufficient time to earn the poverty threshold. The three groups as listed in Table 1 represent the three situations regarding the ability of minimum wage workers to achieve the EU's twin goals of a decent standard of living and time sovereignty.

**Table 1.** Number of 40-hour Workweeks to Achieve Poverty Threshold (2010)

	Country	Single Worker	Four Person Family
<b>Group 1</b>	France	0.53	1.32
	Ireland	0.56	1.32
	Belgium	0.56	1.33
	Poland	0.60	1.36
	Greece	0.61	1.37
	Romania	0.62	1.45
	Netherlands	0.62	1.45
	Portugal	0.68	1.60
	Hungary	0.68	1.45
	Malta	0.69	1.60
<b>Group 2</b>	Lithuania	0.78	1.80
	Spain	0.78	1.82
	Latvia*	0.81	1.32
	Luxembourg	0.84	1.94
	United Kingdom	0.87	1.95
	Slovenia	0.90	1.98
	Slovakia	0.91	1.86
Estonia	0.95	2.08	
<b>Group 3</b>	Czech Republic	1.09	2.45
	Bulgaria	1.15	2.50

\*Latvia falls into Group 1 in the case of a single worker.

Group 1 countries, i.e. those where achievement of the twin goals is possible within the confines of a 40 hour week, is comprised of France, Ireland, Belgium, Poland, Greece, Romania, the Netherlands, Portugal, Hungary, and Malta. Within this group, the observed working hours range between .53 and .69 workweeks, or between 21 and 28 hours per week, in order to meet the minimum threshold for an acceptable standard of living. As such, this worker is able to achieve the threshold of a minimally decent standard of living while also having between 12 and 19 hours left over to dedicate him or herself to activities outside of the job or, if he or she so chooses, pick up additional hours in order to increase his or her material prosperity without compromising either of the EU's twin goals. For example, in Belgium a single person must work .56 standard 40-hour workweeks, or 22.4 hours per week, in order to achieve the poverty threshold. This leaves 17.6 hours of the standard workweek free for a minimum wage worker to work additional hours to increase his or her material prosperity or engage in non-work activities without either goal of the EU being violated.

In the case of a four person family, the same country grouping applies with the addition of Latvia. In this case, the two workers in this family unit must work the equivalent

of between 1.32 and 1.60 full-time jobs per week, which is between 52 and 64 hours per week, in order to reach the poverty threshold. If the couple divides the hours evenly between them, this means that at minimum, that they would have to each work between 26 and 32 hours in order to achieve the minimum standard of living (note that we assume that the dual-earner couple will split the hours evenly between them in order to make this number comparable to that of a single worker simpler). As in the case of the single worker, this leaves adequate time for one or both workers to dedicate time to activities outside of work, or to work more in order to increase material prosperity without sacrificing the goal of time sovereignty. For example, in France a four person family must work 1.32 standard 40-hour workweeks, or 52.8 hours per week, in order to achieve the poverty threshold. Split evenly between the dual earner couple, this means that each worker would need to work 26.4 hours per week in order to reach the minimally decent standard of living. This means that each worker can achieve the goal of minimally decent standard of living while still having 13.6 hours left to use in whatever way he or she desires without his/her time sovereignty being violated. For these workers the minimum wage allows for a very reasonable achievement of the EU's twin goals.

As noted above, Group 2 countries are in a more precarious position. For a single worker, this group includes Lithuania, Spain, Latvia, Luxembourg, the United Kingdom, Slovenia, Slovakia, and Estonia. In these countries minimum wage workers are currently able to achieve the twin goals of a minimally materially prosperous life and time sovereignty, but there is very little leeway for increasing one of these goals without jeopardizing the other (i.e. the ability of these workers to increase their standard of living is limited since they can only work a few additional hours without their time sovereignty being violated. Similarly, if these workers increase their time sovereignty by more than a few hours a week, their ability to meet a minimally decent standard of living is jeopardized). It is also the case that a relatively

minor change in the value of the minimum wage could jeopardize their ability to achieve both of these goals at once the number of hours they must work to earn the poverty threshold is already high and in some cases near the cut-off for Group 3. The observed range of hours in this Group are between .78 and .95 full-time jobs, or between 31 and 38 hours per week. Given that they are working nearly a full-time job to obtain the poverty threshold, this means that it would be difficult for these workers to increase their standard of living beyond that of a poverty income without sacrificing time sovereignty. Similarly, if workers decided to even moderately increase the amount of time they dedicate to non-work activities their ability to achieve the poverty threshold is potentially jeopardized. For example, in the United Kingdom a single worker must work .87 standard 40-hour workweeks, or 34.8 hours per week, in order to achieve the poverty threshold. This leaves a single worker only 5.2 hours per week to either dedicate to non-work activities and/or increase his/her material prosperity. This means that if these workers are not to violate their right to time sovereignty, then they are forced to earn a near poverty-level income. Similarly, these workers cannot readily increase the level of their time sovereignty without jeopardizing their ability to earn a minimally decent standard of living.

Additionally, as mentioned above, any change in the value of the minimum wage could result in minimum wage workers not being able to achieve the poverty threshold without jeopardizing their time sovereignty, thus moving them into Group 3. For example, a single worker in Estonia must work .98 full-time jobs, or 38 hours per week, just to earn the poverty threshold. This means that even a 5% (2 hour) decrease in the temporal value of the minimum wage would push workers there into Group 3.

In the case of a four person family, Group 2 includes the aforementioned countries excluding Latvia. The observed range that a dual-earner couple must work is between 1.80 and 1.98 full-time jobs, or between 72 and 79.2 hours per week, in order to achieve the

poverty threshold. This requires that, at minimum, both workers must work just under a full-time job to earn the minimal standard of living. This again leaves workers very little time to either earn additional income above the poverty threshold without jeopardizing their time sovereignty, or to increase their time sovereignty without jeopardizing their standard of living. To illustrate this we can look at the UK once again where a four person family must work 1.95 standard 40-hour workweeks, or 78 hours per week to achieve the poverty threshold. Split evenly between the dual-earner couple, each worker must work 39 hours per week simply to earn the bare minimum of a decent standard of living. This leaves these workers only 1 hour per week to increase their income and/or to devote to non-work activities if they do not wish to violate their time sovereignty.

Also, as in the case of the single worker, this means that in the event of any change in the value of the minimum wage, their ability to achieve the poverty threshold may be compromised. Ultimately, while both single workers and dual-earner couples in this category are able to fulfill the twin goals of material prosperity and time sovereignty, their situation is precarious because in order to increase either goal (e.g. earn more to increase material prosperity or expand time sovereignty) they would be forced to sacrifice the other and given any significant change in the situation they may be plunged into the unreasonable or impossible category.

Group 3 includes those countries where it is unreasonable for minimum wage workers to achieve the poverty threshold. As mentioned earlier, I define unreasonable the situation in which any one worker must work in excess of one full-time job in order to achieve the poverty threshold and thus is unable to attain simultaneous achievement of the twin goals. In the case of a single worker, Bulgaria and the Czech Republic fall into the unreasonable category. As can be seen from Table 1, a single worker must work between 1.09 and 1.15 full-time jobs, or between 43.6 and 46 hours per week, to achieve the poverty threshold, the



very minimum of a decent standard of living. In practical terms, this means that these workers must sacrifice their time sovereignty simply to achieve a poverty level income. These workers do not have any option to either work less – because they risk falling below the poverty threshold – while working more to improve their situation would only further jeopardize their time sovereignty.

The situation of four person families in these countries, and in Estonia additionally, is even more concerning. The dual-earner couples in each of these countries must work in excess of two full-time jobs, between 2.08 and 2.5 jobs, or between 83.2 and 100 hours per week, simply to meet the poverty threshold. As a specific example, a dual-earner couple in Bulgaria must work 2.5 standard 40-hour work weeks, or 100 hours per week, simply to achieve the poverty threshold. Split evenly between the couple, each person must work 50 hours per week to achieve the poverty threshold (this exceeds the maximum legal workweek and prevents minimum wage workers there from achieving the poverty threshold). As a result, these minimum wage workers are unable to simultaneously meet the twin goals of a minimally materially prosperous life and time sovereignty espoused by the EU.

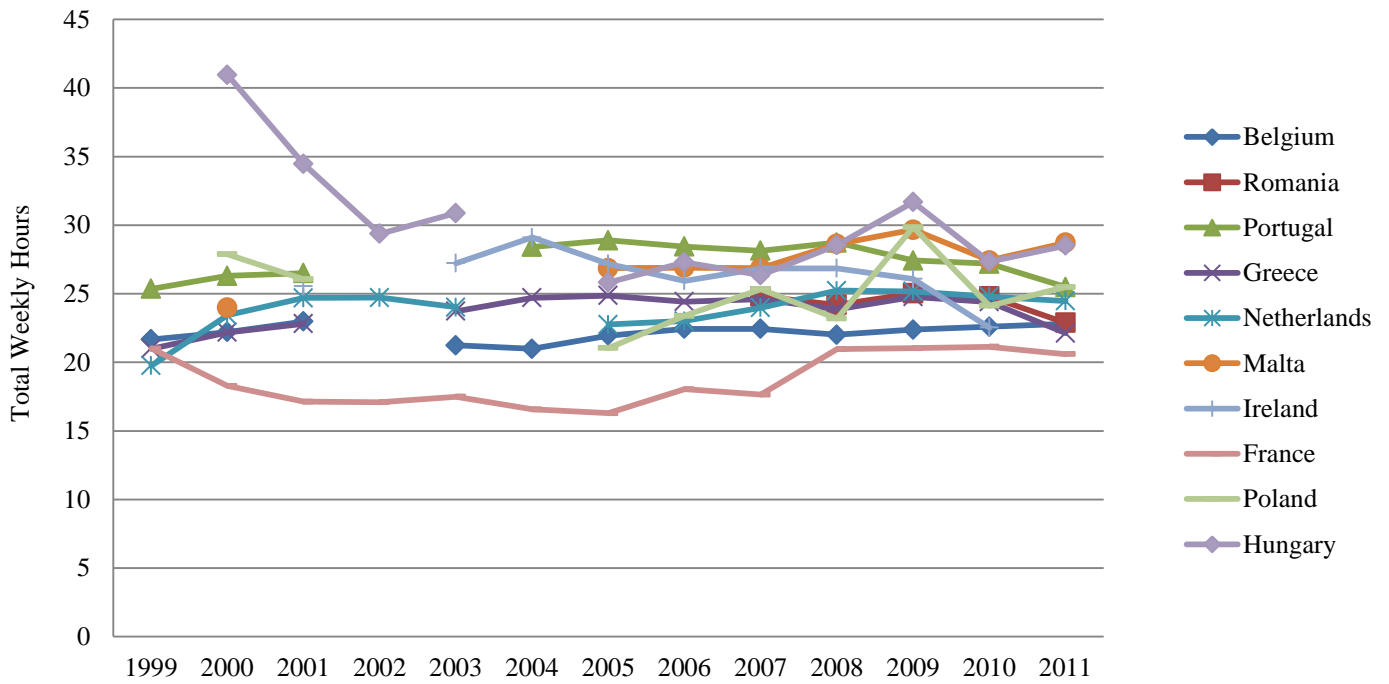
Given the above, we can see that there is considerable variation in the ability of minimum wage workers in those countries to meet the twin goals. In some countries achievement of the twin goals is reasonable and they are easily able to maintain both goals while in other countries workers may be forced to sacrifice one or both of the twin goals as a result of insufficient time. This is problematic given that achievement of the twin goals is supposed to be right guaranteed by the EU to all workers in all member countries.

*Is there significant change over time?*

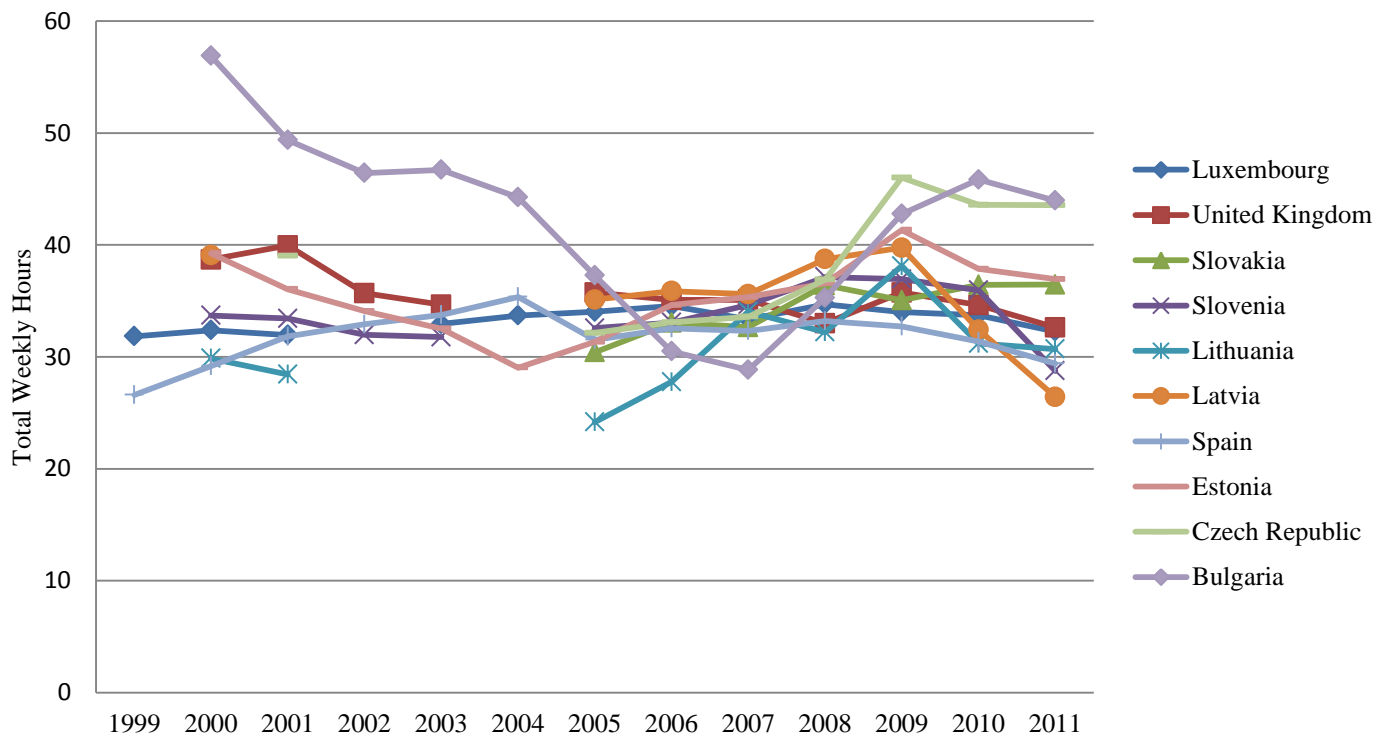
We have seen how there is considerable variability regarding how long a minimum wage worker must work in order to achieve a minimal decent standard of living, i.e. in some

countries minimum wage workers are able to achieve the poverty threshold while maintaining their time sovereignty while in others minimum wage workers must sacrifice time sovereignty in order to maintain minimal material prosperity. This variability is shown in the context of just one year above, but is there variability in minimum wage workers' ability to achieve the twin goals from year to year? This seems to be the case when we look at the data over time. For instance, while in 2010 Estonia fell into the precarious group (Group 2), the previous year Estonia was classified in the unreasonable group (Group 3). In order to get a greater sense of this change over time, I calculated the number of hours necessary to achieve the poverty threshold for both a single worker and a four person family each year that data was available between 1999 and 2011. The results of this are shown in Graphs 1a, 1b, 2a, and 2b and Tables 2 and 3 below.

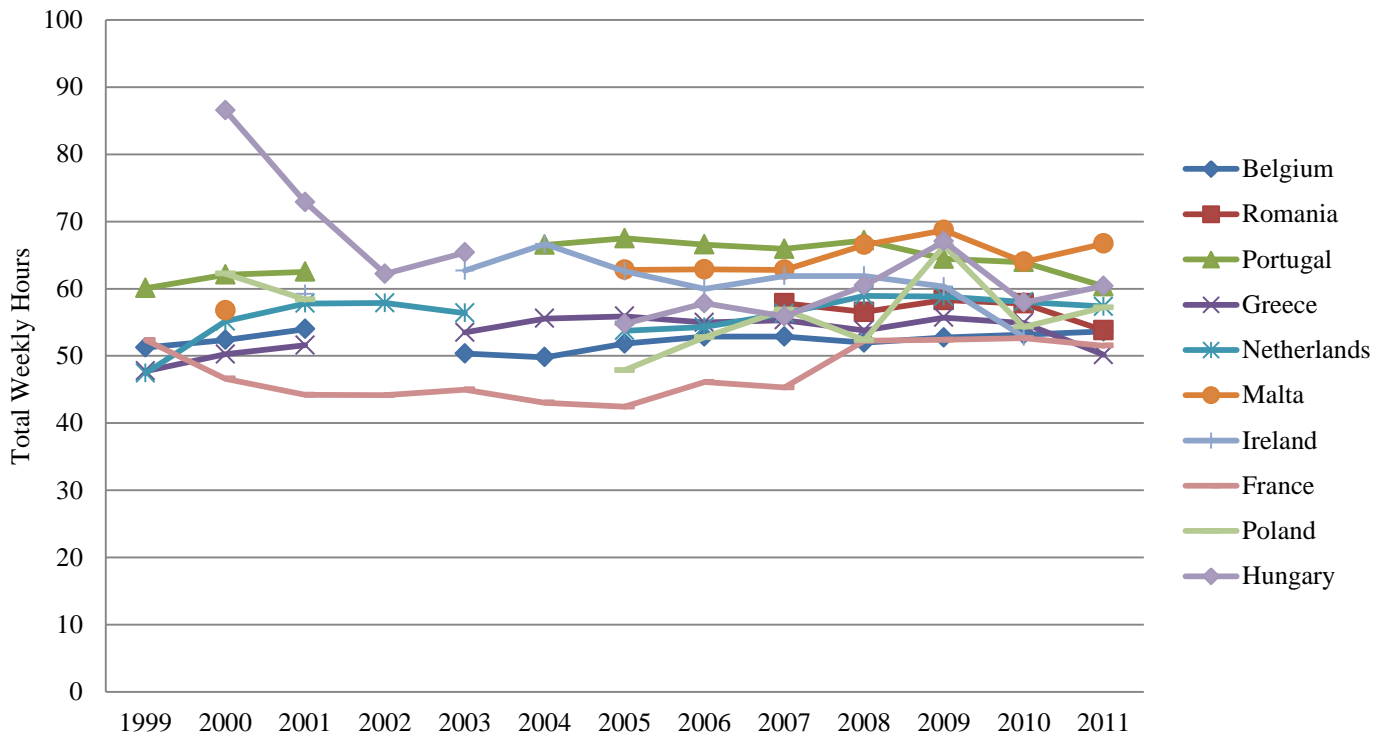
Graph 1a: Weekly Hours Worked for the Poverty Threshold  
Single Worker - Group 1  
1999-2011



Graph 1b: Weekly Hours Worked for the Poverty Threshold  
Single Worker - Groups 2 & 3  
1999-2011



Graph 2a: Weekly Hours Worked for the Poverty Threshold  
Four Person Family - Group 1  
1999-2011



Graph 2b: Weekly Hours Worked for the Poverty Threshold  
Four Person Family - Groups 2 & 3  
1999-2011

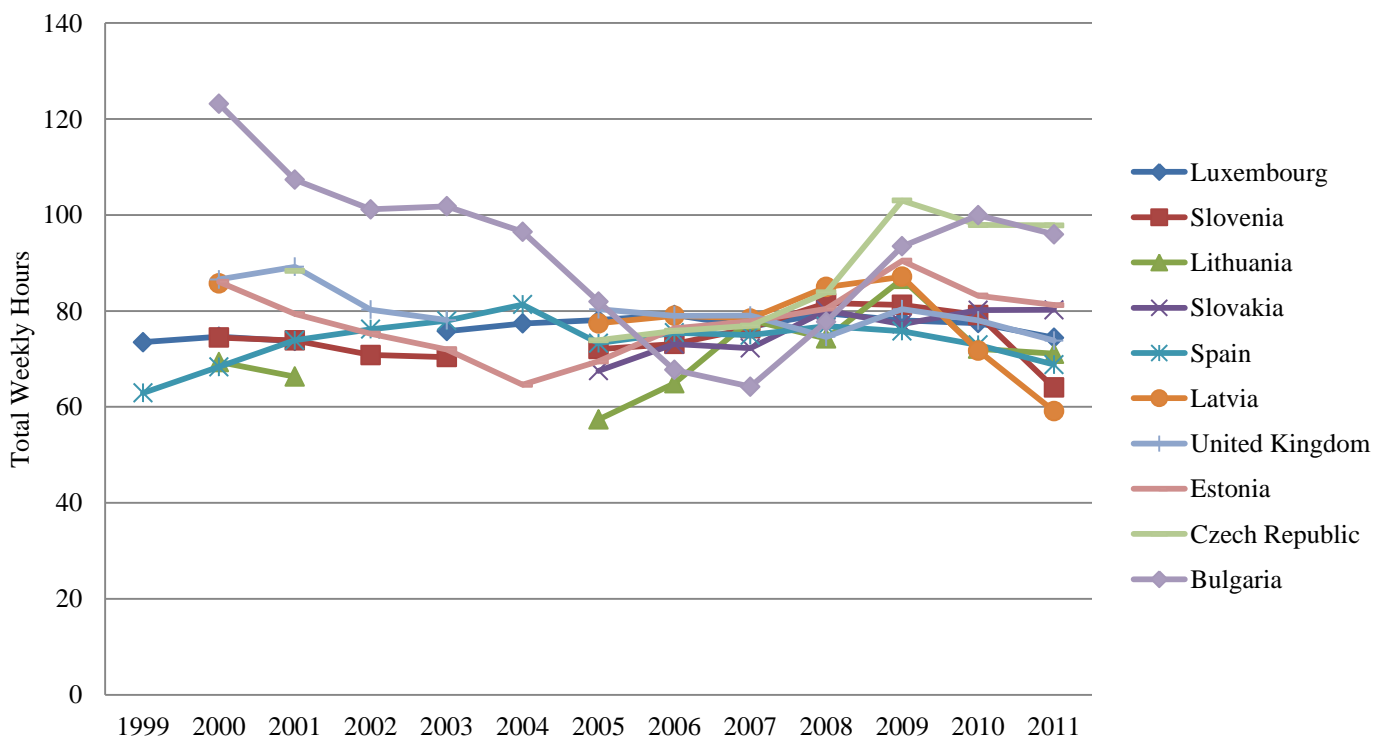


Table 2. Total Hours Worked for Poverty Threshold - Single Worker

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Volatility 2	Group Changes
<b>Belgium</b>	<b>21,67</b>	<b>22,20</b>	<b>22,98</b>		<b>21,24</b>	<b>20,98</b>	<b>21,95</b>	<b>22,44</b>	<b>22,45</b>	<b>22,01</b>	<b>22,38</b>	<b>22,59</b>	<b>22,81</b>	<b>0,58</b>	
Group Changes	1	1	1		1	1	1	1	1	1	1	1	1		0
<b>Romania</b>									<b>24,81</b>	<b>24,20</b>	<b>25,03</b>	<b>24,79</b>	<b>22,88</b>	<b>0,78</b>	
									1	1	1	1	1		0
<b>Portugal</b>	<b>25,35</b>	<b>26,31</b>	<b>26,51</b>			<b>28,41</b>	<b>28,89</b>	<b>28,43</b>	<b>28,14</b>	<b>28,73</b>	<b>27,43</b>	<b>27,19</b>	<b>25,49</b>	<b>1,22</b>	
	1	1	1			1	1	1	1	1	1	1	1		0
<b>Greece</b>	<b>21,00</b>	<b>22,18</b>	<b>22,82</b>		<b>23,72</b>	<b>24,71</b>	<b>24,87</b>	<b>24,42</b>	<b>24,60</b>	<b>23,87</b>	<b>24,78</b>	<b>24,40</b>	<b>22,13</b>	<b>1,23</b>	
	1	1	1	1	1	1	1	1	1	1	1	1	1		0
<b>Netherlands</b>	<b>19,76</b>	<b>23,43</b>	<b>24,69</b>	<b>24,72</b>	<b>24,01</b>		<b>22,76</b>	<b>23,02</b>	<b>23,98</b>	<b>25,24</b>	<b>25,17</b>	<b>24,80</b>	<b>24,47</b>	<b>1,45</b>	
	1	1	1	1	1		1	1	1	1	1	1	1		0
<b>Malta</b>		<b>23,99</b>					<b>26,86</b>	<b>26,90</b>	<b>26,86</b>	<b>28,63</b>	<b>29,67</b>	<b>27,43</b>	<b>28,73</b>	<b>1,62</b>	
		1					1	1	1	1	1	1	1		0
<b>Ireland</b>			<b>25,55</b>		<b>27,22</b>	<b>29,10</b>	<b>27,17</b>	<b>25,94</b>	<b>26,85</b>	<b>26,85</b>	<b>26,08</b>	<b>22,53</b>		<b>1,67</b>	
			1		1	1	1	1	1	1	1	1			0
<b>France</b>	<b>21,01</b>	<b>18,27</b>	<b>17,13</b>	<b>17,10</b>	<b>17,50</b>	<b>16,57</b>	<b>16,29</b>	<b>18,04</b>	<b>17,65</b>	<b>20,96</b>	<b>21,03</b>	<b>21,14</b>	<b>20,60</b>	<b>1,84</b>	
	1	1	1	1	1	1	1	1	1	1	1	1	1		0
<b>Poland</b>		<b>27,88</b>	<b>26,06</b>				<b>21,04</b>	<b>23,39</b>	<b>25,33</b>	<b>23,19</b>	<b>29,85</b>	<b>24,12</b>	<b>25,49</b>	<b>2,48</b>	
		1	1				1	1	1	1	1	1	1		0
<b>Luxembourg</b>	<b>31,83</b>	<b>32,37</b>	<b>31,94</b>		<b>32,93</b>	<b>33,70</b>	<b>34,02</b>	<b>34,54</b>	<b>33,35</b>	<b>34,70</b>	<b>34,00</b>	<b>33,72</b>	<b>32,27</b>	<b>0,95</b>	
	2	2	2		2	2	2	2	2	2	2	2	2		0
<b>United Kingdom</b>		<b>38,68</b>	<b>39,95</b>	<b>35,69</b>	<b>34,65</b>		<b>35,74</b>	<b>35,09</b>	<b>35,09</b>	<b>32,99</b>	<b>35,74</b>	<b>34,62</b>	<b>32,62</b>	<b>2,06</b>	
		2	2	2	2		2	2	2	2	2	2	2		0
<b>Slovakia</b>							<b>30,41</b>	<b>33,05</b>	<b>32,66</b>	<b>36,40</b>	<b>35,05</b>	<b>36,42</b>	<b>36,46</b>	<b>2,19</b>	
							2	2	2	2	2	2	2		0
<b>Slovenia</b>		<b>33,70</b>	<b>33,42</b>	<b>31,97</b>	<b>31,77</b>		<b>32,57</b>	<b>33,07</b>	<b>34,64</b>	<b>37,12</b>	<b>36,94</b>	<b>35,96</b>	<b>28,74</b>	<b>2,36</b>	
		2	2	2	2		2	2	2	2	2	2	1		1
<b>Lithuania</b>		<b>29,86</b>	<b>28,43</b>				<b>24,17</b>	<b>27,76</b>	<b>34,03</b>	<b>32,21</b>	<b>38,12</b>	<b>31,20</b>	<b>30,69</b>	<b>3,74</b>	
		1	1				1	1	2	2	2	2	2		1
<b>Latvia</b>		<b>39,09</b>					<b>35,11</b>	<b>35,86</b>	<b>35,59</b>	<b>38,73</b>	<b>39,74</b>	<b>32,42</b>	<b>26,41</b>	<b>4,09</b>	
		2					2	2	2	2	2	2	1		1
<b>Spain</b>	<b>26,59</b>	<b>29,18</b>	<b>31,82</b>	<b>32,91</b>	<b>33,76</b>	<b>35,35</b>	<b>31,52</b>	<b>32,55</b>	<b>32,32</b>	<b>33,21</b>	<b>32,72</b>	<b>31,36</b>	<b>29,41</b>	<b>2,26</b>	
	1	1	2	2	2	2	2	2	2	2	2	2	1		2
<b>Estonia</b>		<b>39,25</b>	<b>36,04</b>	<b>34,08</b>	<b>32,52</b>	<b>29,03</b>	<b>31,33</b>	<b>34,62</b>	<b>35,33</b>	<b>36,57</b>	<b>41,33</b>	<b>37,86</b>	<b>36,94</b>	<b>3,27</b>	
		2	2	2	2	2	2	2	2	2	3	2	2		2
<b>Czech Republic</b>			<b>39,02</b>				<b>32,14</b>	<b>33,08</b>	<b>33,58</b>	<b>36,89</b>	<b>46,01</b>	<b>43,57</b>	<b>43,55</b>	<b>5,06</b>	
			2				2	2	2	2	3	3	3		1
<b>Bulgaria</b>		<b>56,89</b>	<b>49,36</b>	<b>46,43</b>	<b>46,71</b>	<b>44,25</b>	<b>37,26</b>	<b>30,49</b>	<b>28,83</b>	<b>35,28</b>	<b>42,76</b>	<b>45,83</b>	<b>43,96</b>	<b>7,71</b>	
		3	3	3	3	3	2	2	1	2	3	3	3		4
<b>Hungary</b>		<b>40,95</b>	<b>34,46</b>	<b>29,37</b>	<b>30,88</b>		<b>25,82</b>	<b>27,29</b>	<b>26,35</b>	<b>28,55</b>	<b>31,68</b>	<b>27,34</b>	<b>28,51</b>	<b>4,19</b>	
		3	2	1	2		1	1	1	1	2	1	1		6

Table 3. Total Hours Worked for Poverty Threshold - Four Person Family

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Volatility2	Total Group Changes
<b>Belgium</b>	51,26	52,37	54,00		50,35	49,79	51,83	52,86	52,88	51,96	52,73	53,19	53,64	1,22	0
	1	1	1		1	1	1	1	1	1	1	1	1		
<b>Romania</b>									57,82	56,55	58,30	57,80	53,79	1,64	0
									1	1	1	1	1		
<b>Portugal</b>	60,09	62,10	62,51			66,52	67,51	66,57	65,94	67,18	64,45	63,94	60,36	2,57	0
	1	1	1			1	1	1	1	1	1	1	1		
<b>Greece</b>	47,76	50,25	51,58		53,49	55,55	55,91	54,96	55,33	53,79	55,70	54,90	50,14	2,59	0
	1	1	1	1	1	1	1	1	1	1	1	1	1		
<b>Netherlands</b>	47,45	55,16	57,81	57,87	56,38		53,75	54,30	56,32	58,95	58,82	58,04	57,35	3,05	0
	1	1	1	1	1		1	1	1	1	1	1	1		
<b>Malta</b>		56,77					62,81	62,89	62,81	66,52	68,70	64,00	66,72	3,39	0
		1					1	1	1	1	1	1	1		
<b>Ireland</b>			59,18		62,69	66,64	62,59	60,00	61,90	61,90	60,30	52,84		3,50	0
			1		1	1	1	1	1	1	1	1			
<b>France</b>	52,36	46,61	44,21	44,15	44,99	43,03	42,44	46,11	45,30	52,26	52,40	52,63	51,51	3,86	0
	1	1	1	1	1	1	1	1	1	1	1	1	1		
<b>Poland</b>		62,23	58,40				47,85	52,77	56,87	52,36	66,36	54,33	57,20	5,22	0
		1	1				1	1	1	1	1	1	1		
<b>Luxembourg</b>	73,49	74,62	73,72		75,80	77,40	78,08	79,16	76,67	79,51	78,03	77,45	74,40	2,00	0
	2	2	2		2	2	2	2	2	2	2	2	2		
<b>Slovenia</b>		74,44	73,85	70,80	70,38		72,06	73,11	76,41	81,62	81,24	79,17	64,03	4,95	3
		2	2	2	2		2	2	2	3	3	2	1		
<b>Lithuania</b>		69,34	66,31				57,37	64,92	78,07	74,24	86,67	72,13	71,07	7,85	3
		1	1				1	1	2	2	3	2	2		
<b>Slovakia</b>							67,52	73,07	72,24	80,11	77,26	80,16	80,21	4,59	4
							1	2	2	3	2	3	3		
<b>Spain</b>	62,92	68,34	73,90	76,17	77,96	81,31	73,27	75,44	74,95	76,82	75,78	72,93	68,83	4,74	4
	1	1	2	2	2	3	2	2	2	2	2	2	1		
<b>Estonia</b>		86,07	79,36	75,24	71,98	64,62	69,47	76,38	77,86	80,46	90,46	83,18	81,23	6,86	4
		3	2	2	2	1	1	2	2	3	3	3	3		
<b>Latvia</b>		85,74					77,42	79,00	78,43	84,99	87,13	71,76	59,14	8,58	4
		3					2	2	2	3	3	2	1		
<b>Hungary</b>		86,53	72,89	62,21	65,38		54,77	57,82	55,87	60,48	67,05	57,94	60,39	9,23	2
		3	2	1	1		1	1	1	1	1	1	1		
<b>Czech Republic</b>			88,35				73,87	75,87	76,91	83,86	103,00	97,91	97,84	10,62	2
			3				2	2	2	3	3	3	3		
<b>Bulgaria</b>		123,15	107,34	101,18	101,80	96,51	81,95	67,70	64,22	77,74	93,45	99,92	95,98	16,20	3
		3	3	3	3	3	3	1	1	2	3	3	3		
<b>United Kingdom</b>		86,55	89,20	80,25	78,08		80,37	79,00	79,01	74,59	80,36	78,02	73,81	4,31	5
		3	3	3	2		3	2	2	2	3	2	2		

As can be seen from these graphs, there is not only great variation in the number of hours someone must work in order to achieve the poverty thresholds, but also significant differences in how stable these hours are on a year to year basis. To help make sense of this data, I contextualize it in two ways. The first is by examining how often the countries move between Groups 1, 2, and 3 based on the number of hours necessary to reach the poverty threshold. This measurement gives us a sense of the *qualitative* changes in the ability of minimum wage workers to meet the EU's twin goals changes.

In order to measure this I used the same group definitions as in the previous discussion of achievement of the poverty threshold: single worker (Group 1: >30 weekly hours, Group 2: 31-40 weekly hours, Group 3: >40 weekly hours) and four person family working unit (Group 1: 52 - 64 weekly hours, Group 2: 72 - 79 weekly hours, Group 3: 83.2 – 100 weekly hours). I then labeled each year according to the corresponding group and counted each time a country changed from one group to another. For example, between 2000 and 2004 minimum wage workers in Spain experienced two categorical changes, one between 2000 and 2001 (from Group 1 to Group 2) and another between 2003 and 2004 (from Group 2 to Group 3), as visible below:

	2000	2001	2002	2003	2004	Total Group Changes
Spain	1	2	2	2	3	2

Group change
Group change
= 2 group changes

Each country was then assigned a number corresponding to the total number of group changes. The complete results of this can be seen in Tables 2 and 3 above in the column labeled 'Total Group Changes.' This sort of analysis is important because it highlights qualitative changes in the ability of minimum wage workers to achieve the EU's twin goals (It is possible that from one year to the next a worker's ability to earn the poverty threshold,

and thus fulfill the twin goals, may change drastically; this qualitative measure helps us get a sense of how frequently these changes occur.)

While in theory the amount of hours necessary to achieve the poverty threshold and the relative stability of these hours are not necessarily related; it is possible for a country to require workers to work long hours to achieve the poverty threshold, but these required hours are stable over time, or vice versa. However, in practice what we find is that countries in Groups 2 and 3, those with the highest hours necessary to earn the poverty threshold, tend to also experience greater instability than Group 1 countries. This is shown below in Table 4.

*Table 4. Poverty Country Groups and Volatility Scores*

<b>Country</b>		<b>Total Group Changes Single Worker</b>	<b>Total Group Changes Four Person Family</b>
<b>Group 1</b>	<b>France</b>	0	0
	<b>Ireland</b>	0	0
	<b>Belgium</b>	0	0
	<b>Poland</b>	0	0
	<b>Greece</b>	0	0
	<b>Romania</b>	0	0
	<b>Netherlands</b>	0	0
	<b>Portugal</b>	0	0
	<b>Hungary</b>	6	2
	<b>Malta</b>	0	0
<b>Group 2</b>	<b>Lithuania</b>	1	3
	<b>Spain</b>	2	4
	<b>Latvia</b>	1	4
	<b>Luxembourg</b>	0	0
	<b>United Kingdom</b>	0	5
	<b>Slovenia</b>	1	3
	<b>Slovakia</b>	0	4
<b>Group 3</b>	<b>Estonia</b>	2	4
	<b>Czech Republic</b>	1	2
	<b>Bulgaria</b>	4	3

As can be seen from this table, Group 1 countries (with the exception of Hungary) did not experience any qualitative changes in their ability to meet these twin goals. This means that the value of the minimum wage was stable over time and these countries never experienced a change that was significant enough to affect their ability to fulfill the twin goals of a minimal level of material prosperity and time sovereignty.



In contrast, Group 2 and 3 countries generally experienced a number of qualitative changes in their ability to meet these goals. For example, over the twelve year period studied, minimum wage workers in Bulgaria have experienced four qualitative shifts in their ability to achieve the poverty threshold, half of which represent a shift to a more precarious or unreasonable group and thus a decline in their ability to fulfill the EU's twin goals. If we look at the two year period between 2007 and 2009 workers in Bulgaria went from the reasonable group in 2007, to the precarious group in 2008, and to the unreasonable group in 2009. This means that in the space of two years these workers went from being able to fulfill the twin goals with relative ease to not being able to meet the poverty threshold despite working a full-time job. In practical terms, this means that there was considerable instability in the ability of these workers to have both time sovereignty and a minimally decent standard of living.

For a four person family working unit these patterns look much the same; those countries where minimum wage workers experience higher necessary working hours and thus limited ability to achieve the EU's twin goals tend also to experience more qualitative shifts between groups. For example, in Belgium where the average hours necessary to achieve the poverty threshold for each member of a dual earner couple is about 22 (Group 1), minimum wage workers there have not experienced a qualitative shift out of Group 1 in the twelve year period studied. This means that the four person family earning the minimum wage has not experienced any significant change in their ability to meet the EU's twin goals over the last twelve years, an extraordinarily stable situation. In comparison, minimum wage workers in the UK, where the average number of hours necessary to earn the poverty threshold is about 35 (Group 2), have experienced five qualitative shifts in their ability to fulfill the EU's twin goals over the twelve year period studied moving from Group 2 to Group 3 and back again. Again, this indicates that those workers whose ability to achieve the twin goals is already

precarious, given higher necessary working hours, have also tended to experience less stability in the temporal value of the minimum wage over time.

In addition to examining qualitative change, I also created a more quantitative measure of the change in hours necessary to achieve the poverty threshold by measuring the volatility of working hours. Volatility<sup>3</sup> is essentially a measure of how much change a particular value experiences over a given period of time. Volatility has been traditionally used as a measure of the riskiness of stocks; stocks with a higher volatility experience more change over time and are thus considered to be riskier. In the context of this project, the volatility score for each country will tell us the average absolute change in working hours required to earn the poverty threshold from year to year. To calculate volatility I took the standard deviation of the total number of hours necessary to achieve the poverty threshold over the period 1999-2011. Given that it is a standard deviation, this volatility score represents the number of hours changed (+/-) in 68.2% of the years studied, i.e. if the volatility score is .53, that means that in 68.2% of the years studied the number of hours necessary to earn the poverty threshold fluctuated by +/- .53 hours. The pattern that emerges from the gathered data shows that in fact the ability of minimum wage workers to earn the poverty level income is impacted by significant volatility over the measured period. The volatility of working hours is important to consider because, as mentioned earlier, in some cases even small changes in weekly working hours may negatively impact workers' ability to meet the twin goals of minimal material prosperity and time sovereignty (i.e. small quantitative changes in the hours necessary to achieve the minimum wage can lead to qualitative changes in the ability of workers to achieve the twin goals of the EU). Of course, as a measure of change volatility tells us nothing about whether the changes being made are

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<sup>3</sup> The riskiness of stocks, i.e. volatility “refers to the amount of uncertainty or risk about the size of changes in a security's value. A higher volatility means that a security's value can potentially be spread out over a larger range of values. This means that the price of the security can change dramatically over a short time period in either direction” (www.Investopedia.com).

beneficial to a minimum wage worker or not (e.g. a high volatility score could represent a significant increase or decrease in the number of hours a minimum wage worker must work in order to achieve the poverty threshold). However, what it does represent is how much the time necessary to achieve the poverty threshold has changed in the past and thus indicates how stable or unstable are the hours a minimum wage worker must work to achieve the poverty threshold. As such, with a high volatility score one cannot be sure what their ability to meet the EU's twin goals will be year to year, for better or worse, but rather that the possibility for change is great. In order to measure this change, a volatility index was created. The results of this can be seen in Table 5 below.

**Table 5.** Volatility Score and Average Hours Worked Weekly for Poverty Threshold (1999-2011)

	Country	Single Worker	Four Person Family
<b>Group A</b> (Volatility <5% of standard 40-hour workweek)	<b>Belgium</b>	0.58 (22.14)	1.22 (52.24)
	<b>Romania</b>	0.78 (24.34)	1.64 (56.85)
	<b>Luxembourg</b>	0.95 (33.28)	2.00 (76.53)
	<b>Portugal</b>	1.22 (27.35)	2.57 (64.29)
	<b>Greece</b>	1.23 (23.63)	2.59 (53.28)
	<b>Netherlands</b>	1.45 (23.84)	3.05 (56.02)
	<b>Malta</b>	1.62 (27.38)	3.39 (63.90)
	<b>Ireland</b>	1.67 (26.37)	3.50 (60.89)
	<b>France</b>	1.84 (18.71)	3.86 (47.54)
	<b>Group B</b> (Volatility 5-10%)	<b>United Kingdom</b>	2.06 (35.53)
<b>Slovakia</b>		2.19 (34.35)	4.59 (75.80)
<b>Spain</b>		2.26 (31.75)	4.74 (73.74)
<b>Slovenia</b>		2.36 (33.63)	4.95 (74.28)
<b>Poland</b>		2.48 (25.15)	5.22 (56.49)
<b>Estonia</b>		3.27 (35.41)	6.86 (78.03)
<b>Lithuania</b>		3.74 (30.72)	7.85 (71.12)
<b>Group C</b> (Volatility >10%)	<b>Latvia</b>	4.09 (35.37)	8.58 (77.95)
	<b>Hungary</b>	4.19 (30.11)	9.23 (63.76)
	<b>Czech Republic</b>	5.06 (38.48)	10.62 (87.20)
	<b>Bulgaria</b>	7.71 (42.34)	16.20 (92.58)

\*Average hours worked weekly over 1999-2011 in parentheses.

To help explain these findings, countries can be organized into one of three groups describing the volatility experienced by minimum wage workers there. Group A is *relatively stable* and is defined by a volatility score that represents an average change of less than 5%, relative to a 40-hour workweek, or between 0 and 2 hours. The observed volatility scores in this group lie between .58 and 1.84 hours from year to year. Since the time required to achieve the poverty threshold is quite stable in Group A, if the average number of hours

necessary to earn the poverty threshold is not near the threshold for one of Groups described above (i.e. Groups 1, 2, or 3), there is very little possibility of these countries changing categories. For example, Belgium falls into Group A because it has a volatility score for a single worker of .58 hours which means that in 68% of the years sampled, the amount of time needed to achieve the poverty threshold fluctuated between +/- 35 minutes per week and that in 95% of the years sampled the amount of time needed to achieve the poverty threshold fluctuated between +/- 1.17 hours per week. The average weekly hours necessary to achieve the poverty threshold over the period of 1999-2011 in Belgium totals 22.14, leaving a minimum wage worker 17.86 hours per week free to dedicate to extra work if he or she wishes to earn income above the poverty threshold. This means that a change of 1.17 hours per week will not seriously affect the ability of minimum wage workers to fulfill the twin goals. Even an increase of 1.17 hours per week would not negatively impact a worker's ability to a minimally decent standard of living while still retaining time sovereignty. In fact, if the average weekly hours necessary to achieve the poverty threshold equal 22, it would require the extremely unlikely increase of over 15 standard deviations to push single Belgian minimum wage workers into Group 2. In this sense, the situation of minimum wage workers in Belgium, like the situation of other countries in Group A, is remarkably stable.

Group B includes those moderately unstable countries whose volatility score indicates an average change of between 5 and 10%, relative to a 40-hour workweek, or between 2 and 4 hours. The observed volatility scores of countries in this category fall between 2.06 and 3.74 hours from year to year. In Group B the number of hours required to earn the poverty threshold varies moderately from year to year, so minimum wage workers in these countries that are already close to a given threshold (e.g. reasonable, precarious, or unreasonable) could easily see a qualitative change in their ability to meet these twin goals. For example, the UK has a volatility score of 2.06 hours for a single worker which means that in 68% of the years

sampled the amount of time necessary to achieve the poverty threshold fluctuated by slightly more than  $\pm 2$  hours per week and in 95% of the years sampled that same quantity of time fluctuated by slightly more than  $\pm 4$  hours per week. Given that the average number of hours necessary to earn the poverty threshold in the UK for the sample period is approximately 35.5, that leaves just 4.5 hours free for the minimum wage worker to potentially increase his or her income above that of a poverty threshold. However, an increase of two standard deviations could be easily consumed by work that becomes necessary just to earn the poverty threshold. If this occurs the ability of these workers to meet the twin goals will be significantly negatively impacted such that it will become unreasonable. For countries in Group B, like the UK, this volatility, coupled with the relatively high number of hours they must work in order to achieve the poverty threshold, means that they can experience instability in their ability to meet the EU's twin goals.

Group C includes those countries where the number of hours necessary to achieve the poverty threshold is severely unstable; this group is defined by having a volatility score that represents a change of greater than 10% relative to a 40-hour workweek, or change greater than 4 hours from year to year. The observed volatility scores for these countries lie between 4.09 and 7.71. In Group C, the number of hours necessary to achieve the poverty threshold varies from year to year such that even countries where the average weekly hours necessary to earn the poverty threshold are moderate may be forced to fluctuate between the three groupings and those countries with already high average necessary hours (which disproportionately fill this category) may be forced into unreasonable situations. For example, Latvia, has a volatility index of 4.09 for a single worker, which means that in 68% of the years sampled it fluctuated between  $\pm 4$  hours and 5 minutes and in 95% of the years sampled it fluctuated between  $\pm 8$  hours and 10 minutes. Given that the average weekly working hours necessary to achieve the poverty threshold are 35, even a weekly change of 4

hours could push minimum wage workers to work more than 39 hours per week which would move them from Group 2 to Group 3, while a change of 8 hours would make achievement of the poverty threshold in this country nearly impossible. The situation in Bulgaria is even more striking: already in the unreasonable group for achievement of the poverty threshold, the volatility index for Bulgaria is 7.71, this means that in 68% of years sampled the hours necessary to achieve the poverty threshold fluctuated by +/- 7 hours and 43 minutes and in 95% of years sampled the hours necessary fluctuated by +/- 15 hours and 26 minutes.

Considering this change over the course of a year, minimum wage workers in Bulgaria could be subjected to working +/- 740.8 hours or 18.5 standard 40 hour workweeks just to obtain the poverty threshold.

For a four person family the same groups (A, B, and C) apply and indicate similar situations, i.e. with the increasing volatility of Groups B and C countries are more likely to change categories. For Belgium, Romania, Luxembourg, Portugal, Greece, the Netherlands, Malta, Ireland, and France we see relatively small volatility scores and thus relatively low risk of change in their ability to achieve the twin goals. For example, in the case of Belgium we see that the volatility index increases to 1.22 or about 1 hour and 13 minutes per week; split evenly between both workers, each would need to adjust their amount of work by about +/- 36 minutes. As in the case of a single worker, even an additional 36 minutes per week would not negatively impact their ability to achieve the poverty threshold or to retain time sovereignty; these workers still have time to find additional employment to increase their material prosperity or to dedicate to family or non-work activities. Because the temporal value of the minimum wage in these countries is quite stable over time, workers there are at very low risk for experiencing a change in their ability to achieve the twin goals.

Families in the countries populating Group B, however, are potentially more negatively impacted by volatility and minimum wage workers in these countries that are

already close to a given threshold (e.g. reasonable, precarious, or unreasonable) could easily see a qualitative change in their ability to meet these twin goals. For example, in Latvia, the volatility index increases to 8.58, which means that in 68% of the years sampled the hours necessary to achieve the poverty threshold fluctuated +/- 8 hours and 35 minutes; in 98% of the years sampled the figure fluctuates twice that, 17 hours and 10 minutes. If the working couple splits this increase between them, each would need to adjust their amount of working hours by about 8 hours and 35 minutes per week or slightly more than 10 standard 40-hour workweeks over the course of year. This situation is extremely precarious given that the average weekly hours necessary to achieve the poverty threshold total about 78 per four person unit, or 39 per worker; any increase in the weekly working hours for these workers jeopardizes their time sovereignty and potentially even their ability to earn the minimal materially prosperous income.

Group C includes those countries with the highest volatility index and minimum wage-earning families in these countries may be in a desperate situation. Families working in countries that populate this group may experience frequent qualitative changes in their ability to achieve the twin goals (e.g. fluctuation between Groups 1, 2, and 3) and those countries with already high average necessary hours (which disproportionately fill this category) may be forced into unreasonable situations. For example, Bulgaria's volatility index is 16.2; this means that in 68% of years the weekly hours necessary to earn the poverty threshold fluctuated by +/-16 hours and 12 minutes; in 98% of years the fluctuation doubles to 32 hours and 24 minutes. Split between the dual earner couple, in 98% of years this translates into an adjustment of +/- 16 hours and 12 minutes per week, or just over 19 standard 40-hour workweeks per worker over the course of a year. The average weekly hours necessary to earn the poverty income for a four person family in Bulgaria is 92.6 which, split evenly between the two workers, is 46.3 hours per worker, less than 2 hours away from the very maximum

legal workweek allowed by the EU. The situation of these workers regarding fulfillment of the twin goals of minimal material prosperity and time sovereignty is already unreasonable and nearly impossible, but adding the instability created by the volatility of the temporal value of the minimum wage turns a bad situation into a desperate one.

As mentioned above, in theory there is no reason why the total hours someone would have to work in order to achieve a poverty threshold should be correlated with how stable these hours are over time. However, as was seen in my qualitative measure above, we find that for the most part, the groups used to describe the total hours worked for poverty threshold (reasonable Group 1, precarious Group 2, unreasonable Group 3) correlate strongly with the groupings based on volatility (stable Group A, relatively unstable Group B, severely unstable Group C). This can be seen if we compare the groupings used in Table 1 with the volatility groups from Table 5. This comparison is offered in Table 6 below.

*Table 5. Poverty Country Groups and Volatility Scores*

	Country	Volatility Group Single Worker	Volatility Group Four Person Family
<b>Poverty Group 1</b>	<b>France</b>	A	A
	<b>Ireland</b>	A	A
	<b>Belgium</b>	A	A
	<b>Poland</b>	B	B
	<b>Greece</b>	A	A
	<b>Romania</b>	A	A
	<b>Netherlands</b>	A	A
	<b>Portugal</b>	A	A
	<b>Hungary</b>	C	C
	<b>Malta</b>	A	A
<b>Poverty Group 2</b>	<b>Lithuania</b>	B	B
	<b>Spain</b>	B	B
	<b>Latvia</b>	C	C
	<b>Luxembourg</b>	A	A
	<b>United Kingdom</b>	B	B
	<b>Slovenia</b>	B	B
	<b>Slovakia</b>	B	B
	<b>Estonia</b>	B	B
<b>Poverty Group 3</b>	<b>Czech Republic</b>	C	C
	<b>Bulgaria</b>	C	C



While there are some exceptions, the general pattern is that most countries in volatility Group A also fall into poverty Group 1. This means that in these countries the hours necessary to earn the poverty threshold are low (between 20 and 30 hours per week) and stable (less than 2% change). Most countries in volatility group B fall into poverty Group 2 with hours between 30 and 40 per week. In this case we find that countries that have precariously high working hours also experience moderate instability in the temporal value of the minimum wage. Finally, those countries in volatility group C also fall into poverty Group 3. In these countries the hours necessary to earn the poverty threshold are greater than 40 and severe volatility.

From looking at these results we see that workers who could most benefit from stability of minimum wage levels, those in countries that fall into the precarious or unreasonable group, are subjected to the most unstable situation but that countries in the reasonable group, where working hours are relatively low, enjoy relative stability. In general, the countries with higher working hours have higher volatility scores and tend to experience more qualitative group changes and vice versa. Ultimately this means that minimum wage workers' ability to fulfill the EU twin goals of minimal material prosperity and time sovereignty may be negatively impacted by unchecked volatility. It is difficult not to see the connections these results have to Polanyi's fears of the instability of capitalism as a system – it is very clear here that the temporal value of the minimum wage is volatile in these countries and that volatility has real impacts on the ability of minimum wage workers to meet the threshold for minimal material prosperity and still retain some semblance of time sovereignty.

Given that achievement of the twin goals of minimal material prosperity and time sovereignty are rights guaranteed to workers in the European Union, the ability of minimum wage workers to meet these goals should not fluctuate over time. The fact that achievement

of these twin goals does change over time for some workers is a problem and needs to be addressed.

### *Conclusion*

The most general goal of this project was to analyze the minimum wage in the European Union through the lens of time with two specific goals of determining whether minimum wage workers can in fact achieve the twin goals that the EU describes as rights and how that ability changes over time. In examining this issue, several patterns emerged, but each confirmed that, like both Marx and Polanyi argue, time is in fact an extremely important aspect of work, particularly minimum wage work. We have shown that the ability of minimum wage workers to reach the poverty threshold varies greatly between countries. Based on the ability of minimum wage workers to achieve the poverty threshold, countries fall into one of three groups based on whether it is reasonable, precarious, or unreasonable for minimum wage workers there to earn said threshold. These same groupings also generally correspond to the volatility groupings, i.e. the same countries that fall into the reasonable group for number of working hours also have a reasonable volatility index, while countries in Groups 2 and 3 with high working hours also fall into Groups B and C with high volatility. Given the volatility of working hours, minimum wage workers in the 20 EU countries with a national statutory minimum wage experience varying and sometimes limited ability to even achieve the poverty income; this is especially true for the four person family unit where the addition of two children greatly impacts the ability of the dual earner couple to reach the poverty threshold. This means that minimum wage workers in the EU experience varying ability to fulfill the all-important twin goals of minimal material prosperity and time sovereignty. Ultimately, this demonstrates that the actual situation in the EU is not internally consistent with its rhetoric of the twin goals of minimal material prosperity and time

sovereignty; in some countries minimum wage workers are excluded from the right to have both a decent standard of living and time sovereignty.

So what does this all mean for minimum wage workers in the EU? Broadly, it means that in many countries, minimum wage workers are being left behind in the quest to fulfill the EU's twin goals of minimal material prosperity and time sovereignty. In some countries (France, Ireland, Belgium, Poland, Greece, Romania, the Netherlands, Portugal, Hungary, and Malta) the minimum wage provides an adequate income such that workers are relatively easily able to fulfill the twin goals of minimal material prosperity and time sovereignty. These countries also tend to have low volatility indexes which means that their ability to maintain the twin goals over time stays relatively stable. However, minimum wage workers in a full half of EU countries with national statutory minimum wages (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Luxembourg, Slovakia, Slovenia, Spain, and the United Kingdom) are unable to reliably meet the twin goals – these workers are forced to give up one goal in order to expand the other. Furthermore, it is these countries that often have high volatility indexes, signaling that the ability of minimum wage workers to maintain the twin goals may be threatened or even destroyed altogether given severe enough change in the temporal value of the minimum wage.

Time is thus an essential component in the analysis of the minimum wage because it is a wage that is directly tied to a temporal value and focusing only on the monetary value of the minimum wage only shows us half of the picture. Using time as a lens through which to view the minimum wage allows us to uncover the other half of the picture and understand not only the material but the temporal situations of minimum wage workers. We see that not only is there significant material variation in the situation of minimum wage workers across the EU, but even in cases where material prosperity is similar there is temporal inequality that

would otherwise be invisible (e.g. comparing Belgium and Luxembourg where material prosperity is comparable but the temporal sacrifice to achieve that prosperity is different).

The implications of this are great given that the minimum wage is specifically designed to be the lowest wage that still guarantees these twin goals. However, there are two issues to address based on this study: the ability of minimum wage workers to earn the poverty threshold and the volatility of that ability over time. In the cases of those countries where minimum wage workers are only precariously able or unable to achieve the poverty threshold – Latvia, Lithuania, Spain, Luxembourg, the UK, Slovenia, Slovakia, Estonia, the Czech Republic, and Bulgaria – the twin goals are very clearly not being fulfilled and the situation there is not consistent with the rhetoric of the EU. In this case, a reevaluation and increase of the minimum wage level would be a logical solution. One option is to create a cap on the number of hours that any minimum wage worker should need to work to earn the poverty threshold and adjust the minimum wage accordingly.

In order to address the second issue and curb the impact of volatility in these countries, it may be useful to take cues from the more stable countries in how they adjust their minimum wages. France provides a good example of a country with relatively low volatility and working hours; in this case, yearly upratings of the minimum wage are pegged to inflation and thus represent real and steady increases in income.

This study is exploratory and theoretical and as such leaves considerable room for further questions and investigation. One important follow-up to this study would be to examine how the findings of this study affect minimum wage workers in practice. This would require determining exactly who are minimum wage workers in order to see whether these findings preponderantly affect particular social groups like women, migrant workers, etc. Given Marx's assertions that capitalism eventually consumes all of a worker's free time, another important line of inquiry would be to determine whether there is a correlation

between increased number of working hours and how "free" the market is. Further study should also extend this analysis to countries where the minimum wage is collectively bargained in order to determine the situation for those workers. Are minimum wage workers in countries where the minimum wage is determined by collective bargaining more likely to be able to achieve the twin goals than those workers in countries where the minimum wage is determined nationally? This is an important question. Finally, it would be beneficial to our understanding of the experience of minimum wage workers to compare the findings of this study with the levels of social support and welfare provided by each country, i.e. do countries where workers are not able to reach the poverty threshold have social provisions that lessen the negative impact of not achieving the twin goals? In sum, this project demonstrates the great importance of time, particularly for minimum wage workers whose wage is directly limited by temporal factors, and the need to continue examining this important aspect of work.

### *References*

- Andersen, J. Goul, C. Barkholdt, B. de Vroom, K. Kramer, and G. Naegele. 2003. "A New Organisation of Time Over Working Life." European Foundation for the Improvement of Living and Working Conditions.
- Dickens, Richard and Alan Manning. 2004. "Has the National Minimum Wage Reduced UK Wage Inequality?" *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 167(4):613-626.
- Dolado, Juan, Francis Kramarz, Stephen Machin, Alan Manning, David Margolis, Coen Teulings, Gilles Saint-Paul, and Michael Keen. 1996. "The Economic Impact of Minimum Wages in Europe." *Economic Policy*: 11(23):317-372.
- European Commission. 2010. *Industrial Relations in Europe 2010*.
- European Trade Union Confederation. 2007. "Social Europe." European Trade Union Confederation. Retrieved November 30, 2012. (<http://www.etuc.org/r/816>).
- Freyssinet, Jacques and Francois Michon. 2003. "Overtime in Europe." European Industrial Relations Observatory On-line. Eurofound. Retrieved April 11, 2013. (<http://www.eurofound.europa.eu/eiro/2003/02/study/tn0302101s.htm>).
- Investopedia.com. 2013. "Volatility." Retrieved April 11, 2013. (<http://www.investopedia.com/terms/v/volatility.asp>).
- Levin-Waldman, Oren. 2003. "The Minimum Wage and the Cause of Democracy." *Review of Social Economy* 61(4):487-510.
- Machin, Stephen and Alan Manning. 1997. "Minimum Wages and Economic Outcomes in Europe." *European Economic Review* 41(3-5):733-742.
- Machin, Stephen, Alan Manning and Lupin Rahman. 2003. "Where the Minimum Wage Bites Hard: Introduction of Minimum Wages to a Low Wage Sector." *Journal of the European Economic Association* 1(1):154-180.
- Marx, Karl and Eugene Kamenka. 1983. *The Portable Karl Marx / Selected, Translated in Part, and with an Introduction by Eugene Kamenka*. New York: Viking Press.
- Marx, Karl. 1867. *Capital*. England: Penguin Books.
- Metcalf, David. 2008. "Why has the British National Minimum Wage had Little Or no Impact on Employment?" *Journal of Industrial Relations* 50(3):489-512.
- Mixon, J. W., Jr. 1978. "The Minimum Wage and Voluntary Labor Mobility." *Industrial and Labor Relations Review* 32(1):67-73.
- Pedace, Roberto and Stephanie Rohn. 2011. "The Impact of Minimum Wages on Unemployment Duration: Estimating the Effects using the Displaced Worker Survey." *Industrial Relations* 50(1):57-75.

- Polanyi, Karl. 1944. *The Great Transformation*. Boston: Beacon Press.
- Robinson, Helen and Jonathan Wadsworth. 2007. "Impact of the Minimum Wage on the Incidence of Second Job Holding in Britain." *Scottish Journal of Political Economy* 54(4):553-574.
- Schor, Juliet B. 2005. "Sustainable Consumption and Worktime Reduction." *Journal of Industrial Ecology* 9(1-2): 37-50.
- Schulten, Thorsten and Andrew Watt. 2007. "European Minimum Wage Policy – A Concrete Project for a Social Europe." *European Economic and Employment Policy Brief*. No. 2. 1-9.
- Schulten, Thorsten. 2008. "Towards a European Minimum Wage Policy? Fair Wages and Social Europe." *European Journal of Industrial Relations* 14(4):421-439.
- Schulten, Thorsten. 2012. "Minimum Wages in Europe Under Austerity: WSI Minimum Wage Report 2012. ETUI Policy Brief. Vol. 5.
- Seo, Ji-Won. 2011. "Excessive Overtime, Workers, and Productivity: Evidence and Implications for Better Work." *Better Work Discussion Paper Series*: No. 2.
- Skidmore, Paul. 1999. "Enforcing the Minimum Wage." *Journal of Law and Society* 26(4):427-448.
- Stigler, George J. 1946. "The Economics of Minimum Wage Legislation." *The American Economic Review* 36(3):358-365.
- UK Parliament Department for Business, Innovation, and Skills. 2012. "National Minimum Wage: Low Pay Commission Report 2012."
- Vaughan-Whitehead, Daniel. 2010. "Minimum wage revival in the enlarged EU: Explanatory factors and developments." *The Minimum Wage Revisited in the Enlarged EU* / Edited by Daniel Vaughan-Whitehead. Cheltenham, UK; Edward Elgar; Geneva, Switzerland : International Labour Office, c2010. 1-56.
- Warhurst, Chris, Caroline Lloyd and Eli Dutton. 2008. "The National Minimum Wage, Low Pay and the UK Hotel Industry: The Case of Room Attendants." *Sociology* 42(6):1228-1236.
- Webb, Sidney. 1912. "The Economic Theory of a Legal Minimum Wage." *Journal of Political Economy* 20(10):973-998.
- Wirtz, Anna and Friedhlem Nachreiner. 2010. "The Effects of Extended Working Hours on Health and Social Well-Being – A Comparative Analysis of Four Independent Samples." *Chronobiology International* 27(5): 1124-1134.