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This report was prepared by the Lithuanian Free Market Institute in cooperation with the Institute of Market Economics (Bulgaria), the Center for Economic and Market Analyses (the Czech Republic), the Center for Free Economic Thought at the Estonian Business School (Estonia), the Civil Development Forum (Poland) and the Institute of Economic and Social Studies (Slovakia).



This publication was made possible through the support of a grant from the Rising Tide Foundation. The opinions expressed in this publication are those of the author(s) and do not necessarily reflect the views of the Rising Tide Foundation.



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Executive summary

A mandatory minimum wage is a complicated and inaccurate policy tool for poverty reduction that involves unintended consequences and drawbacks. Its downsides and pitfalls are frequently overlooked. Real effects of increases in mandatory minimum wage are hard to measure due to a lack of counterfactual analysis or even reliable data measuring how businesses cope with increases in minimum wages.

There is evidence showing that increases in mandatory minimum wage might force some firms to increase prices, lay off workers, cut fringe benefits for employees and engage in other revenue-boosting or cost-cutting measures. Additionally, a high mandatory minimum wage might stimulate the spread of the shadow economy.

A high level of mandatory minimum wage may “flatten” incomes and result in reduced effort and disincentivization of workers earning slightly more than the minimum wage. These effects can at least partially be countered by mandatory minimum wage driving all wages up. However, this may also result in an inflationary spiral or contribute to inflationary pressures.

Studies from various international organizations recommend setting mandatory minimum wage between 30 and 40 percent of the average wage and differentiating it to lower negative effects.

Differentiation of mandatory minimum wage (by age, area, occupation etc.) may offset some of the negative effects of a relatively high mandatory minimum wage, by allowing lower minimum wage levels for some workers. At the same time differentiation may ramp-up mandatory minimum wage for certain groups even higher.

Our research spans eight countries. We review minimum wage statistics and policies in Bulgaria, Denmark, Estonia, the Czech Republic, Lithuania, Poland, Slovakia, Switzerland.

In most EU countries the mandatory minimum wage accounts for more than 40 percent of the average wage. In the countries under review the minimum wage has grown faster than the average wage and labour productivity since the financial crisis. Our data indicate that a higher ratio between the minimum and average wages is linked to higher unemployment levels.

Most European countries have a statutory minimum wage. Most of the countries under review apply no formal criteria for setting the minimum wage, and minimum wage setting appears to be a politicized matter.

Introduction

Raising mandatory minimum wage might seem to be a simple policy that serves to increase wages for low-income earners. Politicians use this policy with good intentions to reduce poverty and inequality. Yet, it has serious drawbacks and creates unintended consequences.

The aim of this paper is to shed light on the complexity of the issue of minimum wage. We argue that there is much more that needs to be taken into account when setting minimum wages than is usually discussed or considered in political debates.

In this paper we look into three aspects of minimum wage regulation. Firstly, we investigate minimum wage complexities from a theoretical standpoint. Secondly, we provide statistical information for selected countries regarding changes in minimum wage regulation. Lastly, we describe the political process behind decisions to apply minimum wages across selected countries in order to analyse to what extent economic circumstances are taken into consideration when setting the minimum wage.

1. Effects of minimum wage regulation

1.1. Employment effects

According to neoclassical economic theory employment of low-earning individuals may decrease as a result of increased mandatory minimum wages (assuming that labour markets for low-skill workers function in low-friction environments) because when the mandatory minimum wage goes up, businesses demand fewer workers and employment falls. While real-life situations are more complicated and multifaceted, this underlying economic rationale still holds. An increase in the mandatory minimum wage above the equilibrium market wage will lead to a growth in unemployment; as the gap between the two widens, the rate of unemployment increases (or the effects occur faster).

Income levels of low-skilled workers who lose their jobs as a result of increases in the minimum wage dramatically decrease (admittedly, income depends on the size and regime of unemployment benefits). At the same time though a higher mandatory minimum wage increases salaries for workers who continue with their jobs. So in a way, this policy might seem to involve a utilitarian dilemma: Which of the two — higher minimum wages or higher employment — is better? This trade-off is especially pronounced when a mandatory minimum wage accounts for 40 percent or more of the average wage (IMF, 2016).¹

It is important to take into account that the most vulnerable groups such as inexperienced workers, young adults, people with disabilities, low-skilled workers as well as workers in areas with below-average wage levels (usually in rural areas) are most likely to be affected by job losses. Raising minimum wages might thus harm social groups which this policy is intended to help in the first place. Furthermore, if policy makers consciously trade a fall in employment for slightly higher minimum wages, they should take into account that from a strictly utilitarian perspective (and based on behavioural economics) people are averse to losses. Loss aversion suggests that people perceive losing a job as a loss that is larger than a gain from having their wages raised even if the change in their respective income is by a comparable amount (Tversky and Kahneman, 1984).²

On the other hand, some economists point out that under certain conditions (e.g. a monopsony setting) where there are few firms (employers) in the low-skill labour market, a higher mandatory minimum wage may increase both employment and wages. In a monopsony setting there is one employer with a sufficiently high market power who can pay its workers wages below the competitive market

equilibrium level. At this lower wage level, fewer employees are willing to work. This kind of monopsony power may arise due to frictions in markets (for instance, when people are unwilling or unable to move to other cities for job opportunities).

In real world economies a monopsony setting is unlikely. Neumark and Wascher (2007)³ reviewed many earlier studies in the U.S. and the UK and concluded that most of the studies were consistent in finding negative employment effects from increases in minimum wages. Jardim et al (2017)⁴ investigated hourly wages and hourly employment changes after drastic minimum wage increases in Seattle, U.S. The authors found that investigating employment changes in hours worked rather than in headcount revealed more negative effects of minimum wages on employment. Even more, according to the authors, “the minimum wage increase to \$13 from the baseline level of \$9.47 reduced income paid to low-wage employees of locatable Seattle businesses by roughly \$62 million on an annual basis”. Both of these findings suggest a contradiction to the idea that the real economy is best described by a monopsony model from which we would expect to see a rise in employment after an increase in the minimum wage level.

In reality, the full effects of increases in the minimum wage on employment might be hard to untangle, especially if the increases occur during times of high economic growth. During these periods the effects of increased demand for labor might offset the negative effects on employment. Consequently, policy makers often choose to increase mandatory minimum wages precisely during periods of economic growth.

1.2. The wage pass-through mechanism and labour costs

According to the efficiency wage theory studied by Shapiro and Stiglitz, employers pay such wages to employees that make sure that employees do not shirk. In other words, people should be incentivized by wages in such a way that if they lose their jobs it would be more costly for them to find a new one than to exert a sufficient effort in their current jobs. According to this theory, a higher minimum wage trickles-up through the labour market and people earning just above the minimum wage will continue to need to receive higher remuneration than the minimum wage after the rise of it. IMF studied this pass-through mechanism⁵. They found that in CESSEE⁶ a one percent rise in the minimum wage leads to a 0.01-0.15 percent rise in the average wage. This result is more pronounced in countries or sectors where more workers earn the minimum wage. For instance, in Lithuania’s construction sector the pass through of 1 percent rise in the minimum wage is 0.6 percent while in the financial sector it is only 0.1 percent.

¹ Cross-country report on minimum wages (June 2016)

² Choices, values, and frames. <http://dx.doi.org/10.1037/0003-066X.39.4.341>

³ Can be retrieved at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=961374

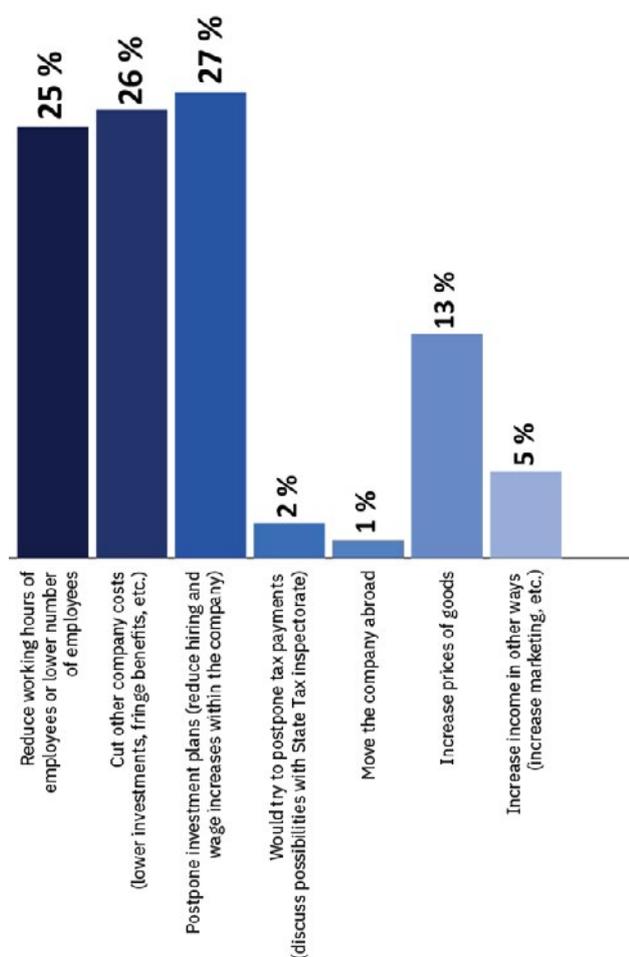
⁴ Can be retrieved at <https://www.nber.org/papers/w23532.pdf>

⁵ Cross-country report on minimum wages (June 2016)

⁶ “CESSEE” refers to the following countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine.

An increase in labour costs is likely to affect most businesses. According to the efficiency wage theory, some may cut their workforce, spending on fringe benefits or educational training while others may be completely driven out of the market. On the macro level, an artificial politically-driven rise in a wage level may reduce a given country's competitiveness. Additionally, all employment concerns raised in the previous section may affect businesses that mostly pay above minimum wages due to the pass-through mechanism too.

Picture 1. Anticipated effects of minimum wage increases



Source: A representative survey of Lithuanian businesses, 2017, Lithuanian Free Market Institute

On the other hand, if businesses do not raise wages for employees earning above the minimum wage after an increase in the mandatory minimum wage level, incentives of such employees may fall. Guvenen, Kuruscu & Ozkan (2014)⁷ show that the flattening of income distribution may reduce workers' incentives to acquire human capital. Nevertheless, the authors also mention that minimum wage laws affect incentives mostly for the lower part of the income distribution and not across the whole economy. Intuitively, the

importance of the pass-through mechanism diminishes as long as income increases because the difference between the minimum wage and higher salaries within economies remains relatively large.

1.3. A note on data measurement

Even though all of the previously mentioned effects might seem to be easily measured empirically, the problem goes deeper. Obviously, a lack of experimental setting in the real economy and the use of only observational data for measuring the effects of mandatory minimum wage creates issues with understanding causation. Another issue is how well the data describe the current situation. For instance, it is easy to measure employment numbers but it is harder to see how many workers had to start working involuntarily part-time due to changes in the minimum wage and it is even more difficult to measure the effort exerted by employees and its changes. In addition, minimum wage increases might force certain employers to cut down on other cash or non-cash compensation (e.g. meals for staff)⁸, and it is near impossible to capture such effects on a macro level.

Furthermore, only a small fraction of working population earns minimum wage. This leads to studies proxying minimum wage workers by taking teenage employment or food service sector employment as instruments (Jardim et al, 2017)⁹.

Therefore, empirical models lack not only the counterfactual insights i.e. what would happen in the economy without changes in the minimum wage, but even reliable data that measure all the effects of minimum wage increases on labour markets. Thus, empirical findings regarding the minimum wage instruments should be viewed with caution.

1.4. Should one standard mandatory minimum wage apply to all?

Minimum wage differentiation is a double-edged sword. On one hand, one-size-fits-all mandatory minimum wage generally has disproportionate effects on poorer areas, businesses with low value added, or employees with less experience (for example, student workers). If differentiation is used to lower minimum wage for some groups, then it could help those socially vulnerable groups that could lose jobs if the increases in mandatory minimum wages were enacted across the board. On the other hand, differentiation of the minimum wage that allows paying certain groups less might contradict the objectives why the minimum wage is increased / introduced in the first place (such as making sure that basic needs of people are met with labour earnings). Alternatively, introducing higher minimum wages for certain sectors of the economy (e.g. highly regulated sectors with substantial barriers to entry) could be used as a rent-seeking tool by

⁷ Guvenen, F., Kuruscu, B., & Ozkan, S. (2014). Taxation of Human Capital and Wage Inequality: A Cross-Country Analysis. *Review of Economic Studies*, 818-850. doi:10.3386/w15526

⁸ Zizzi cuts staff perks as minimum wage increases, *Financial Times*, 2016, <https://www.ft.com/content/11797148-07e5-11e6-a623-b84d06a39ec2>

⁹ <https://evans.uw.edu/sites/default/files/NBER%20Working%20Paper.pdf>

the incumbent employees at the expense of the public.

For instance, the Netherlands has a system with nine different minimum wages based on age. Teenagers at the age of 15 earn the lowest minimum wage and then it rises each subsequent year and reaches the “adult-rate” minimum wage when employees are 23. J. Kabátek¹⁰ finds that the probability of job separation for employees increases by 1-2 percent three months before their birthday. These results are sector-dependent and they are most pronounced in supermarkets. Research suggests that heterogeneity in the minimum wage regulation may have its winners and losers because some workers might be preferred to others.

If we accept that younger workers have less experience but a higher potential future productivity compared to older workers, paying youngsters less may be an effective way of including them into the labour force and helping them avoid potential inactivity spells that can be especially damaging in early working life stages.

1.5. Shadow economy

As with many issues regarding mandatory minimum wage, its effects on the shadow economy may be twofold. On one hand, businesses might pay their employees the required minimum wage and undeclared wages (“envelope wages”) on top. If that were the case, a higher minimum wage might shift the informal wages into the formal sector. On the other hand, with higher mandatory minimum wages businesses might not be able to pay official wages and may be forced deeper into the shadow economy. They may formally employ workers with part-time contracts and additionally pay “envelope wages” to make sure that the total labour costs (official and undeclared) for employing a worker are lower than required under the mandatory minimum wage but still equal to the competitive market wage.

Tonin (2006)¹¹ finds that increases in the mandatory minimum wage may increase compliance and fiscal revenues, thus reducing the shadow economy. Empirical research of the effects of minimum wage increases on the shadow economy in Romania by Davidescu and Schneider (2017)¹² indicates that in the long-run a higher minimum wage may support the shadow economy but has no effect in the short-run there. This may suggest that both positive and negative effects are at play in the short run but further research is needed.

1.6. Higher minimum wages as a channel for inflation

Higher mandatory minimum wages may lead to wage-push inflation. As mentioned earlier, higher mandatory minimum wages may also increase wages for

higher income employees as well, which means that more people and businesses are affected, not only minimum wage earners. Higher labour costs might force businesses to raise prices, which in turn causes inflation. Research conducted by ECB in Central and Eastern Europe suggests that indeed one of the most popular adjustment channels for firms to deal with mandatory minimum wage increases is raising production prices.¹³

Interestingly, there is a continuous debate across Europe calling for depoliticizing minimum wages and setting independent mechanisms for adjusting mandatory minimum wage. For example, linking minimum wage to inflation to ensure that real minimum wages stay at least constant. Even though such policies make minimum wages more easily predictable and prevent political abuse to a certain degree, they can also create a vicious cycle and boost inflation. An increase in the minimum wage leads businesses to raise prices. This causes inflation, which then leads to yet another increase in the minimum wage. Therefore, even if an automated, depoliticized mechanism for adjusting mandatory minimum wages is introduced, it is not foolproof.

Similarly, there are proposals for setting the mandatory minimum wage as a certain percentage of the average wage. This policy creates similar positive feedback mechanisms as higher minimum wages lead to higher average wages over and over (especially if minimum wages are earned by a substantial part of population).

1.7. A flawed path to poverty reduction

The effect of minimum wages on poverty rates is limited as most people who receive income below the poverty level do not work at all. Minimum wage increases do not target them. In addition, while employment is an individual characteristic, “poverty” is defined in household terms by Eurostat. Many of the so-called “working-poor” are in fact workers that receive wages that are higher than the minimum wage but at the same time are part of a household that includes adults with no or little income or a high number of children.

Furthermore, with possible employment losses from minimum wage increases it may happen that poverty rates can go up. Neumark and Wascher (1997)¹⁴ analysed probabilities that after an increase in the mandatory minimum wage poor families escaped poverty and non-poor families fell into it. They found an increase in both probabilities which suggests that raising minimum wage is ineffective in fighting poverty. To add, most people who work but still fall in poverty are those who work few hours or have short employment spells during the year (OECD report¹⁵). This suggests that raising mandatory minimum wages that are paid for full-time employment rarely helps.

¹⁰ Effects of Age-Dependent Minimum Wage on youth Employment Flows in the Netherlands (<http://www.sole-jole.org/16151.pdf>)

¹¹ can be retrieved at <https://www.mnb.hu/letoltes/minimu-wage.pdf>

¹² can be retrieved at <http://ftp.iza.org/dp11247.pdf>

¹³ Can be retrieved at <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2122.en.pdf?45248cf85a038b24e691669e4aaae7c4>

¹⁴ Can be retrieved at <http://www.nber.org/papers/w6127>

¹⁵ Can be retrieved at <https://www.oecd.org/els/emp/45219514.pdf>

Higher minimum wages also increase the duration of long-term unemployment¹⁶. This further reduces skills of jobless people and burdens the unemployed because it becomes even more difficult for them to find jobs with high minimum wages in the future.

Policy makers should try to achieve a balance and make it as easy as possible for the long-term unemployed to find new jobs. This might come through faster requalification or even a lower minimum wage that could lead companies to hire people with less experience.

1.8. Recommendations from international organizations

A cross-country report on minimum wages by IMF (June 2016) summarizes some research focusing on what the appropriate level of mandatory minimum wage should be. Most of the studies though are country-specific, as it should be expected.

Most studies investigating the optimal level of the minimum wage focus on the ratio of minimum wage to average wage. A Joint report from ILO, OECD, IMF and the World Bank¹⁷ estimates that a minimum wage should correspond to around 30-40 percent of the median wage. It is important to note that due to the skewness of income distribution, the median wage tends to be lower than the average wage in most countries. Some earlier research by IMF that focused on individual countries suggested similar findings.

For instance, a report on France¹⁸ suggested that the government should consider a freeze on further increases in the minimum wage because it already exceeds 50 percent of the average wage and creates obstacles for low-skilled workers to find jobs. A 2018 country report on Lithuania by IMF¹⁹ states that a minimum wage set at 45 percent of the average wage is inefficient and harms low-skilled and young workers in rural areas. Rutkowski²⁰ from the World Bank suggests that the minimum wage should be set taking into account wage distribution and unemployment levels. In other words, where the unemployment rate is higher, the minimum wage should be lower. He suggests that countries with high youth unemployment rates should differentiate their minimum wage and make it age-specific.

This argument about unemployment levels or economic cycles in general is often overlooked by politicians. Policy makers are quick to raise the minimum wage by stating that in an economic boom cycle there is little effect on employment. However, minimum wages are rarely (if at all) lowered during the time of economic decline. Indeed, negative effects of minimum wage increases are masked during economic booms but they often manifest themselves during the periods of economic downturns when businesses are unable to hire workers at high prices but politicians are reluctant to lower minimum wages.

IMF²¹ also raises an issue that a uniform application of the minimum wage may result in heavy burdens for employees

and employers in some regions or sectors. To alleviate these effects, the minimum wage should be differentiated, especially where literature finds large negative employment effects: in poorer regions in the country, for young people without experience, for long-term unemployed, etc.

Table 1. Main suggestions from international organizations

Increase differentiation of mandatory minimum wage levels within economies
Minimum wage evaluation should take into account economic cycles
Mandatory minimum wage should correspond to 30 - 40 percent of the median wage

1.9. A summary of the effects of minimum wage regulation

Table 2. Pros and cons of raising mandatory minimum wage

Pros	Cons
Higher wages for the lowest income earners	In a competitive model, lower employment
Decreases inequality at low levels of minimum to average wage ratio	Creates involuntary unemployment
In a monopsony setting, more employment and higher wages	Increased labour costs for all business or lower effort by employees
Reduced shadow economy if employers pay minimum wage plus undeclared wage	Increased shadow economy if not full working hours are declared
Ensures that working population can earn sufficient-to-survive wages	Higher inflation
	Prolonged recovery from economic bust because minimum wages are rarely lowered
	Fails to reduce poverty rates
	Lower investments and employee training expenditures
	May lower competitiveness by affecting firms' costs and prices
	Might reduce job opportunities for unemployed, inexperienced or low-skilled workers
	Might force some companies to abandon development plans
	Aggravates youth unemployment
	Raises the likelihood and duration of unemployment
	May force some firms out of the market

¹⁶ IMF, Cross-country report on minimum wages (June 2016)

¹⁷ Can be retrieved at <https://www.oecd.org/g20/topics/framework-strong-sustainable-balanced-growth/Boosting%20jobs%20and%20living%20standards%20in%20G20%20countries.pdf>

¹⁸ Can be retrieved at <https://www.imf.org/external/pubs/ft/scr/2013/cr13251.pdf>

¹⁹ Can be retrieved at <https://www.imf.org/en/Publications/CR/Issues/2018/06/25/Republic-of-Lithuania-2018-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-46017>

²⁰ Can be retrieved at https://www.researchgate.net/publication/237565452_THE_MINIMUM_WAGE_CURSE_OR_CURE

²¹ Cross-country report on minimum wages (June 2016)

Minimum wage regulation is a complicated policy tool. Many different aspects of an economy have to be taken into account before making a decision about the level of minimum wage. Minimum wage creates a trade-off between wages and employment. Additionally, it might create efficiency losses and interfere with employees' incentives. Minimum wage regulation may also drive up inflation or the shadow economy. Finally, minimum wage regulation is not an accurate tool to combat poverty as many people living in poverty do not work at all or work part-time. This suggests that decisions regarding minimum wage regulation should be country specific and rules-of-thumb do not provide adequate advice due to heterogeneity of countries, businesses and employees. What should not be done is politicizing solutions and taking economic analysis away from a purely economic decision.

2. Mandatory minimum wage regulation in selected countries

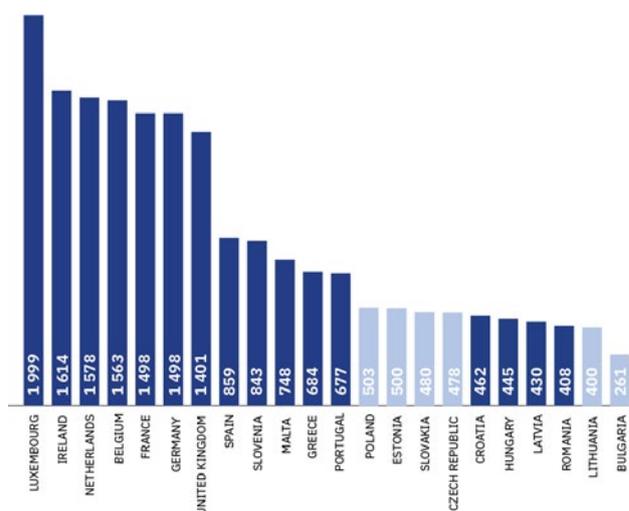
The following two sections provide an overview of mandatory minimum wage statistics and regulations in eight selected countries. The countries under analysis are Bulgaria, the Czech Republic, Denmark, Estonia, Lithuania, Poland, Slovakia and Switzerland.

Mandatory minimum wage is set by law in six countries in question, namely in Bulgaria, the Czech Republic, Estonia, Lithuania, Poland and Slovakia. There is no statutory minimum wage in Denmark and Switzerland.

Minimum wage levels vary only slightly among the six countries, with Bulgaria being a clear outlier. At the end of June 2018²² the minimum wage was set at 261 EUR in Bulgaria, 400 EUR in Lithuania, 478 EUR in the Czech Republic, 480 EUR in Slovakia, 500 EUR in Estonia, and 503 EUR in Poland. Gross mandatory minimum wage is displayed in Picture 2. Net minimum wages or total labour costs for employing a worker that earns a minimum wage are different and may create a different ranking among the selected countries.

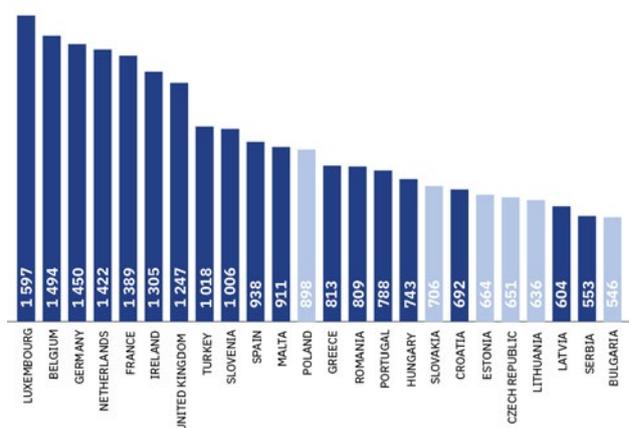
An important measure of the mandatory minimum wage is how much the minimum wage can buy eliminating price differences among countries. In purchasing power standard (PPS), Polish mandatory minimum wage corresponds to 898 PPS. However, the differences among other five countries are relatively minor and there mandatory minimum wages fall in range from 546 PPS in Bulgaria to 706 PPS in Slovakia. The Czech Republic, Estonia and Lithuania have mandatory minimum wages set at around 650 PPS.

Picture 2. Mandatory minimum wage in EUR (2018).



Source: Eurostat.

Picture 3. Mandatory minimum wage in purchasing power standard (2018).



Source: Eurostat.

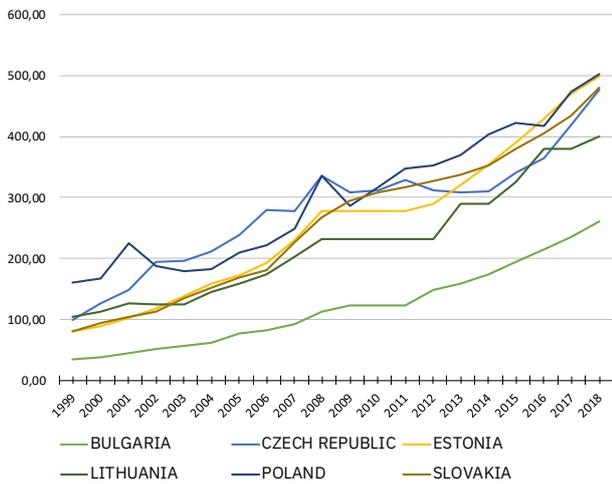
Before the financial crisis that started in 2008, mandatory minimum wage grew rapidly across all countries under review with a brief exception in Poland in 2002 and 2003. In Poland the minimum wage expressed in euros went down, but this decline may be attributed to a decrease in the PLN/EUR exchange rate. The euro appreciated against the Polish zloty by 20 percent in those two years, which resulted in a reduction in the Polish minimum wage denominated in euros.

Since the start of the recent financial crisis, the mandatory minimum wage more than doubled in Bulgaria (from 112 to 260 EUR). In the Czech Republic, the mandatory minimum wage was slightly lowered during the crisis and in the aftermath of it (2008-2014). In the period between 2015 and 2018 it rose rapidly, by an average of 11.5 percent per year. Similar tendencies can be observed in Lithuania and Estonia where the minimum wage remained relatively constant in the period from 2008 to 2012 and then it was

²² For Bulgaria, the Czech Republic and Poland the mandatory minimum wage is set in the national currency but for comparison purposes it is converted into euros.

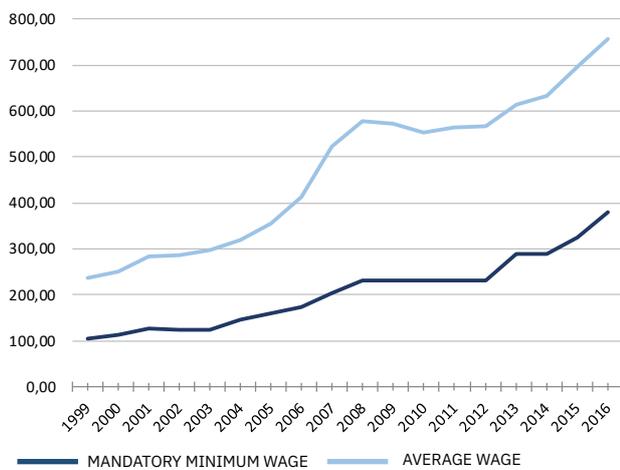
increased substantially. The minimum wage in Slovakia and Poland went up during the whole period from 2008 to 2018, albeit at a slower pace. Nevertheless, the growth rate of the minimum wage in those two countries during and after the financial crisis was still rapid. Picture 3 depicts these mandatory minimum wage tendencies.

Picture 4. Mandatory minimum wage in EUR at year end (1999-2018).



Source: Eurostat.

Picture 5. Mandatory minimum wage in EUR (2008-2016)



Source: Eurostat.

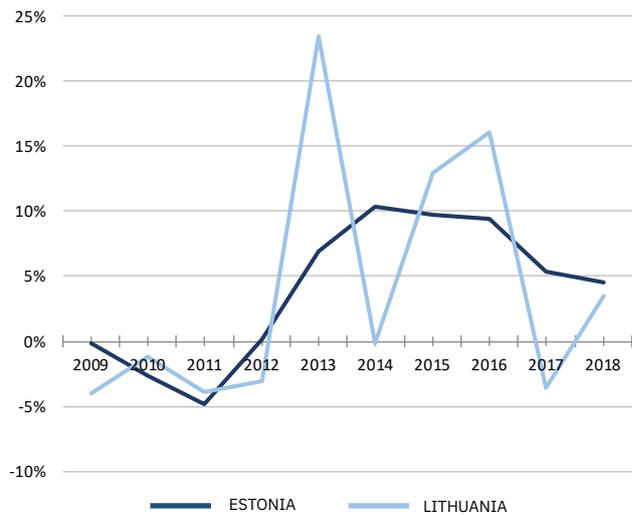
A problem arises when we compare average wages with mandatory minimum wages for a longer period of time. Picture 4 displays the minimum and average wages in Lithuania for the period from 1999 until 2016. During the financial crisis (2008-2012) the mandatory minimum wage remained constant while the average wage slightly fell. The data suggest that a mandatory minimum wage is rather a political than economic debate. Politicians are reluctant to lower minimum wages, even though from an economic perspective that should be a correct decision in light of economic decline and falling average wages. A high mandatory minimum wage may intervene with economic recovery and

extend it because it puts a burden on companies that wish to hire new employees.

Consider Estonia and Lithuania in the period from 2009 to 2018 (Picture 6). The real mandatory minimum wage grew by 44 percent in Estonia and by 42 percent in Lithuania in 2008 through 2018. Both countries allowed their real (not nominal) mandatory minimum wage to go down during the financial crisis in the period from 2009 to 2011. Later Estonia sustained a more stable growth rate during the period from 2013 through 2018 and on average raised its real mandatory minimum wage by 8 percent per year. Lithuania shows a more sporadic growth of the real mandatory minimum wage. While in 2013 the real mandatory wage rose by 24 percent and in 2016 by 16 percent, in 2017 the real minimum wage fell by 4 percent. The sporadic nature of real mandatory minimum wage might create difficulties for local business because in such circumstances it becomes much more difficult to anticipate the mandatory wage level for a year ahead and so future labour costs, thus creating risks for businesses.

There are ample avenues for research on the topic of what kind of effects in the microstructure of markets dispersion differences in real mandatory minimum wage growth rates have.

Picture 6. Real mandatory minimum wage growth rates YoY in 2017 Euros (2009-2018H1).



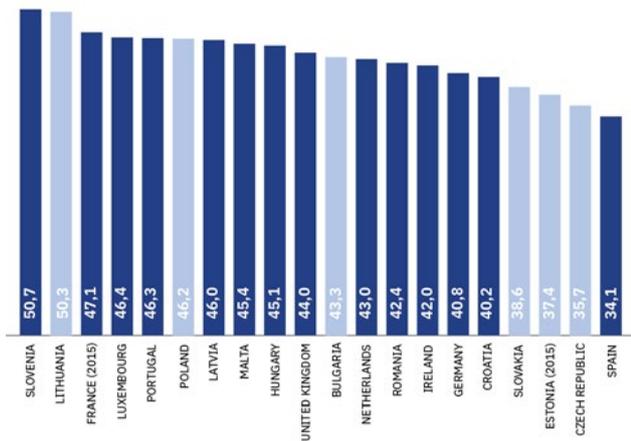
Source: Eurostat.

Comparing mandatory minimum wage with the average wage in a country gives a clearer picture of how restrictive the minimum wage is. It can be noted that in three out of six countries the mandatory minimum wage accounts for more than 40 percent of the average wage, creating obstacles for employment. In this comparison Lithuania differs from other countries. Lithuania is the only country where the mandatory minimum wage made up more than half of the average wage in 2016. The second highest mandatory minimum wage compared to the average wage was set in Poland where it comprised 46 percent of the average wage. The lowest mandatory minimum wage with respect to the

average wages was set in the Czech Republic and Estonia²³, 36 and 37 percent of the average wage respectively. As mentioned earlier, international organizations recommend that the ratio of the minimum wage to the median wage should be between 30 to 40 percent.

One should keep in mind that the median wage in a country is generally lower than the average wage due to the skewness in income distribution. Thus, minimum wage to median wage ratios would be even higher than the ones summarized in this paper.

Picture 7. Mandatory minimum wage as a percentage of the average wage (2016).



Source: Eurostat.

Comparison of growth rates of average wages and mandatory minimum wages²⁴ in the period from 2013 to 2018 shows that in all countries under analysis the mandatory minimum wage was raised faster than the average wage grew (Picture 8). The largest difference between those growth rates was in the Czech Republic. In this country the mandatory minimum wage grew by 55 percent while the average grew only by 12.5 percent and in 2018 the minimum wage stands at slightly more than 40 percent of the average wage. The smallest difference was observed in Lithuania, where mandatory minimum wage increased only by 2 percentage points more than the national average wage (nevertheless, Lithuania had the highest ratio between MMW and the national average wage among the countries under review). One has to keep in mind though that in Lithuania the mandatory minimum wage still made up around half of the average wage.

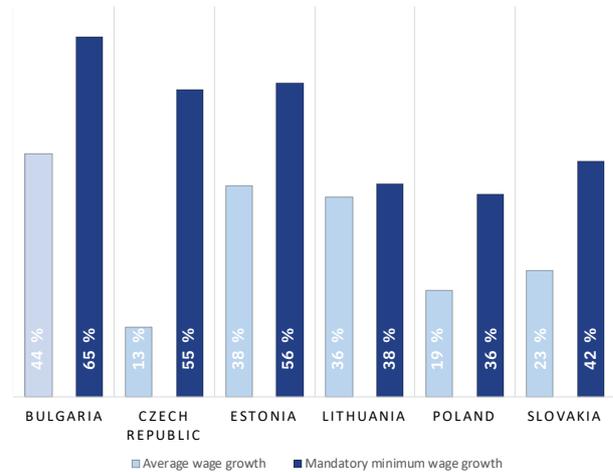
The ratio between the mandatory minimum wage and the average wage differs substantially within a country. We illustrate this point with an example from Lithuania. Lithuania has 10 regional administrative units - counties - (Lith. apskritys) and the mandatory minimum wage is set at the national level. The ratio between the minimum and average wages across counties ranges from 41 percent to 57 percent. Regulation of mandatory minimum wage thus affects different businesses within a country differently based not only on their sector but also on their geographical location. Similar differences across regions can be seen in

²³ Data for Estonia is from 2015.

²⁴ Growth in "wages and salaries" which is a Labour Cost index component. The index covers all market economic activities except agriculture, forestry, fisheries, education, health, community, social and personal service activities. Source: Eurostat.

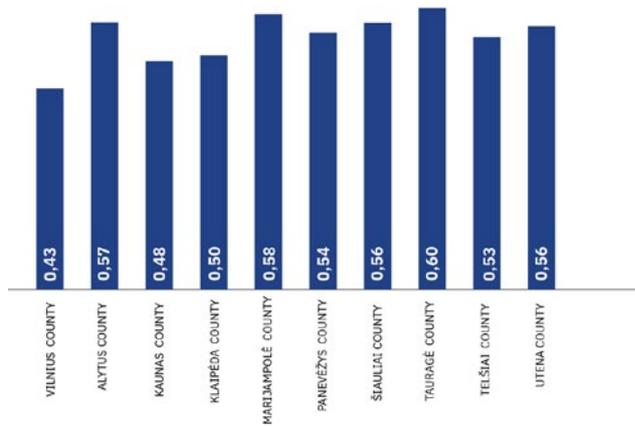
other countries as well. For instance, in Slovakia's Bratislava region the ratio stands just below 50 percent, while in the Presov region the minimum wage accounts for more than 70 percent of the average wage.

Picture 8. Average growth vs. mandatory minimum wage growth (2013-2018)



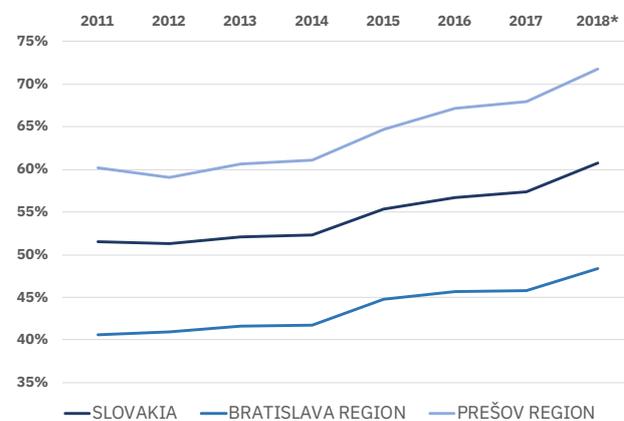
Source: Eurostat

Picture 9. Mandatory minimum wage and average wage ratio for Lithuanian counties (2017 EoY).



Source: Statistics Lithuania.

Picture 10. Share of minimum wage in regional median wage in the most and least developed regions of Slovakia.



A linear OLS regression between the unemployment level and the ratio of the mandatory minimum wage to the average wage in Lithuania's 60 municipalities is displayed in Picture 11. Municipalities with a higher minimum to average wage ratio tend to have higher unemployment figures. These results are statistically significant at a 1 percent level of significance ($p\text{-value} < 0.01$). A 1 percentage point rise in the minimum to average wage ratio coincides with a 0.2 percentage point rise in the unemployment level. This regression can explain around 14 percent of variation in the unemployment level. While this does not prove causation between higher minimum wages and unemployment, it suggests that it is not advisable to apply a uniform mandatory minimum wage across all municipalities.

Picture 11. Regression of unemployment level on mandatory minimum wage over average wage ratio for Lithuanian municipalities (2017 EoY).



Source: Statistics Lithuania.

A linear OLS regression model only looks into static differences across municipalities and does not account for any municipality-specific effects. But what happens when the minimum to average wage ratio changes? Our data indicate²⁵ that an increase in the minimum to average wage ratio has a negative effect on the unemployment level keeping economic cycle as proxied by the wage growth the same. A one percentage point increase in the ratio coincides with a 0.16 percentage point increase in the unemployment level. This result is statistically significant at a 0.1 percent level of significance. However, our data do not suggest that there is a difference in the effect of the change in the minimum to average wage ratio on unemployment during different economic cycles. This finding is indicated by the interaction term in the model.

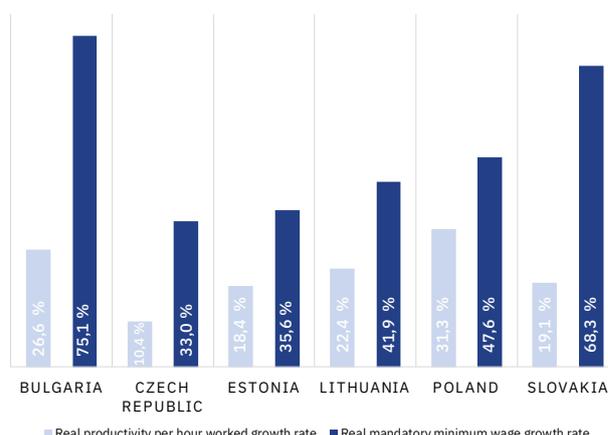
Further on we compare real mandatory minimum wage growth with the growth of real productivity per hour worked in the period of 2008 through 2017. While productivity²⁶ is a measure of real economic growth, minimum wages are set by governments. This comparison thus gives us some insight into the extent to which policy makers take into account economic variables when deciding on minimum wage

²⁵ Annex No.1

²⁶ We choose to use the measure of productivity per hour worked instead of productivity per working person, because the minimum wage is also set for hourly wage (sometimes explicitly and sometimes implicitly when mandatory monthly minimum wage and the number of hours worked per week for full-time employment are regulated).

levels. Picture 12 displays this comparison. Clearly, in all of the countries under review, minimum wage growth significantly outpaced the growth of productivity. For instance, in Slovakia real minimum wage grew by 68 percent during the period, while productivity increased only by 19 percent. Minimum wages that grow too rapidly reduce countries' competitiveness.

Picture 12. Real productivity per hour worked growth vs. real mandatory minimum wage growth (2008-2017)



Source: Eurostat.

3. The process of setting minimum wage

In all of the countries under review which set mandatory minimum wage by law, governments have a final say in the matter. Before the government takes its decision though, negotiations with tripartite or social partners regarding mandatory minimum wage levels take place.

In all countries except Poland national labour laws contain no rules for setting mandatory minimum wage and no requirements to evaluate any economic factors before setting the level of minimum wage. Without any binding rules for policy makers to base their minimum wage regulation on other economic variables, minimum wage policies might get politicized.

In Poland, national labour law lays down rules for setting the minimum wage. Those are not binding though and are routinely changed in the tripartite commission or unilaterally by the government. However, national law requires evaluating economic factors in setting the minimum wage level. The government delivers various data to the tripartite commission, but neither the commission nor the government is obliged to follow them, other than forecasted CPI (Consumer Price Index). The only mandatory factor in determining the minimum wage level is that the minimum wage has to go up by at least the inflation rate, in other words by a forecasted change in CPI.

Mandatory minimum wage usually applies to all occupations irrespective of other demographic factors of employees.

However, Slovakia does not apply the mandatory minimum wage uniformly at the national level as other countries under review do. By law, Slovakia differentiates its minimum wage by type of jobs. The types indicate the level of job difficulty. In total, there are six levels of the minimum wage, standing at 100 percent, 120 percent, 140 percent, 160 percent, 180 percent and 200 percent. It should be noted that those levels are not applicable for public sector jobs. The level of 200 percent is applicable to the highest managerial positions. Yet, as politicians set only the lowest level of minimum wage (480 EUR in 2018), it might be that this multiplication of minimum wage for certain job levels might create additional problems. This might be especially pronounced if the difficulty of a job is incorrectly set and, correspondingly, productivity of a job does not match the minimum wage. Further research is needed to investigate if it alleviates or aggravates negative effects of the minimum wage in Slovakia.

Lithuania has a two-tier minimum wage differentiation. The minimum wage can only be paid for unskilled labour, while qualified employees should receive higher wages than the minimum wage. This law inflicts an additional administrative burden as the employers have to evaluate and prove that certain job positions can be defined as skilled or unskilled.

In Bulgaria, the Czech Republic and Poland, national law does not permit collective agreements deviating from the labour law regarding the minimum wage regulation. In Estonia, Lithuania and Slovakia collective agreements may deviate from the main labour law regarding the minimum wage regulation. Still, in these countries the minimum wage can only be raised but not lowered compared to the national law.

Even though there is no statutory minimum wage in Switzerland, a mandatory minimum wage can still be enforced in a sector. Minimum wages in collective agreements may be declared mandatory provided over 50 percent of employers employing over 50 percent of employees are covered by the collective agreement. It means that if in a given industry (for example, the construction industry) 50 percent of employers (in the industry) employing over 50 percent of employees (in the industry) are covered by a collective agreement and reach an agreement regarding the minimum wage, the federal government can declare this minimum wage to be mandatory for all employees in the sector.

Danish minimum wages are exclusively set either by collective agreements or by individual agreements and there is no government interference in either. Approximately, three quarters of Danish employees are covered by collective agreements. Danish collective agreements work in two ways:

1. They set actual wages for employees without leaving any room for individual negotiations between a certain employee and his/her employer.

2. They set only the minimum wages. In this case, employees are entitled to an individual wage negotiation every year. It is important to note that employees are not automatically entitled to any wage increases during these negotiations.

The second option is by far the most common. Around 80 percent of employees who are covered by collective agreements have their wages set on this basis. One could say that trade unions in Denmark have accepted that a manager and an employee in an individual negotiation may set wages without interference from either trade unions, employer organisations or government. There is no obligation for companies to be members of any employer organisations.

Companies that are not covered by collective agreements set their wages through individual negotiations and contracts.

Most of wage setting in Denmark is done individually while collective agreements determine minimum wage levels within industries.

There are various policy options concerning mandatory minimum wage. Denmark and Switzerland do not have any mandatory minimum wage implemented by law. In those countries most wages are determined by collective and individual agreements between employees and employers. In contrast, Bulgaria, the Czech Republic, Estonia, Lithuania, Poland and Slovakia have implemented mandatory minimum wages by law. Mandatory minimum wage levels in comparison to the average wage differ significantly among these countries. Poland is the only country to apply rules for how the mandatory minimum wage level are set and to require that the minimum wage must be increased each year by at least a forecasted inflation rate. In Estonia, Lithuania and Slovakia collective agreements in certain industries can set their own rules regarding the minimum wage. In these agreements, the minimum wage cannot be lowered below the statutory minimum wage. Finally, of those six countries only Slovakia allows differentiation of mandatory minimum wage by jobs based on the difficulty of jobs.

4. Conclusions

Minimum wage regulation is a complicated issue. Policy makers often tend to oversimplify the matter, and the process of setting minimum wages is too politicized. Mandatory minimum wages can lower employment under a perfect competition model but they increase it under a monopsony model. Yet, empirical findings show that hardly anytime employment increases after a hike in the minimum wage. In addition, increases in the minimum wage lead employers to raise other wages to make sure that their employees exert the same amount of effort. This augments the burden for all businesses and not only for those which employ minimum wage earners. Alternatively, income distribution flattens and this lowers incentives for workers.

Differentiation of the mandatory minimum wage creates its winners and losers. It is a double-edged sword: it may alleviate negative effects of the minimum wage, but may also increase them. It can therefore be evaluated only on a case-by-case basis. What is more, minimum wage might create wage push inflation issues. Mandatory minimum wages may also have ambiguous effects on the shadow economy. International organizations recommend that minimum wages should be kept between 30 and 40 percent of the average wage and heterogeneity of minimum wages should be applied.

Statistical analysis of mandatory minimum wages shows to what extent mandatory minimum wages are linked to any other economic variables in reality. Our research does not find any such links that would indicate that policy makers take into account other economic factors at play. We find that minimum wages outgrow average wages or even productivity rates. Data on Lithuanian municipalities suggest that increases in the ratio between minimum wage and average wage raises unemployment levels. A one percentage point increase in the ratio coincides with a 0.16 percentage point increase in the unemployment level. Finally, we conclude that nominal minimum wages are never lowered, even in the periods of economic downturns. Too high mandatory minimum wages in times of economic decline threaten to prolong them and impede recovery. Therefore, there is economic rationale for lowering mandatory minimum wages.

Analysis of the political process behind minimum wage regulation in selected eight countries shows that most countries have a mandatory minimum wage established by law. The policy making process in those countries does not involve evaluation of any economic variables, with the exception of Poland. In Poland the minimum wage must be raised by a forecasted inflation rate at least. However, this regulation puts a threshold on the minimum wage but does not cap it.

All in all, our research suggests that a complicated economic decision of minimum wage regulation usually becomes a political debate. In our opinion, this is not the right way to go. Even though economic upturns may disguise negative effects of higher minimum wages, those problems might surface during economic decline.

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Annex

Regression results of the unemployment level on the mandatory minimum wage to average wage ratio, dummy for declining real average wage and interaction between the two variables (2000-2017). Fixed effects panel data model. Lithuanian municipalities (2017 EoY).

Unemployment level	Panel data model
Minimum to average wage ratio	16*** (2.6)
Real wage is declining from last year = 1	7.6*** (2.1)
Interaction between the ratio and the dummy	'-5.5 (4.1)

Source: Statistics Lithuania.

