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THE EFFECT OF INCREASING THE MINIMUM WAGE ON POVERTY AND INEQUALITY IN BOSNIA AND HERZEGOVINA

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ABSTRACT: *The minimum wage, as a labour market policy with distributive impact, is widely debated in Bosnia and Herzegovina (BiH). This paper estimates the effect of increasing the minimum wage on poverty and income inequality in BiH, providing the first empirical evidence on the minimum wage in the country. Using data from the Household Budget Survey (HBS) for 2015, the effects of four changes (two per entity) in the minimum wage were simulated using the microsimulation model BiH-MOD. First, the effect of the latest changes implemented in the previous period was calculated using the previous minimum wage level as the baseline. Second, the effect of recently proposed changes was simulated*

using the current level as the baseline. The findings suggest that increasing the minimum wage in BiH has a significant positive effect on poverty reduction, but a limited effect on the level of income inequality. The estimated effects were also calculated for different types of households. The results suggest that a single policy may have unexpected effects if other policies are not taken into account and harmonized accordingly. The findings provide empirical evidence for decision-makers and future policy debate, which is generally missing for this and similar policy issues in BiH.

KEY WORDS: *minimum wage, simulation, poverty, inequality*

JEL CLASSIFICATION: D31, D63, E27, I32, I38

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1. INTRODUCTION

A statutory minimum wage is a tool that is often used to improve the well-being of workers. In a simplified scenario, a statutory minimum wage cuts out the left tail of the wage distribution and reduces inequality. However, possible and often neglected consequences of increasing the minimum wage that may impact the overall level of inequality include a reduction in total employment, effect of substitution of low-skilled workers with those with more human capital, and the effect of spillover on higher wages. The impact also differs in the context of a dual labour market, where labour market institutions are introduced to benefit and protect insiders, while further harming outsiders. Consequently, the overall distributional effects need to be investigated empirically. This paper offers the first empirical assessment of the distributional impact of changes in the minimum wage in Bosnia and Herzegovina (BiH), a country with some of the highest inactivity and unemployment figures, particularly among the vulnerable groups that remain outside the usual labour market arrangements, which are determined by political parties.

The labour market in BiH has the highest unemployment rate (25.4% in 2016) in the Western Balkans and a high rate of informal employment of around 30% (Oruč & Bartlett, 2018). The highest rate of informal work is among low-educated workers: around 86% of workers with no education and 62% of those with only primary education work informally (Oruč & Bartlett, 2018). Furthermore, the difference between public and private sector wages means that public sector employees in particular push decision-makers to increase the statutory minimum wage. Increasing the minimum wage in such circumstances leads to increased costs for employers and potentially to an increase in the level of unemployment and informal employment.

The minimum wage is part of the tax-benefit system in both administrative units (entities) of BiH, the Federation of Bosnia and Herzegovina (FBiH) and the Republic of Srpska (RS). The FBiH introduced a minimum wage in 2005 through the General Collective Agreement at a level of around 50% of the average salary. The Republic of Srpska introduced a minimum wage in 2006 at a lower level than in the FBiH, at around 40% of the average salary. In the following years there were several changes in the minimum wage level. In the FBiH the last change in 2016 was the most important, while in the RS there were additional increases after

2016. In both entities the minimum wage is the subject of public debate, regardless of the different legal provisions, and policymakers are pressured to increase the minimum wage level. This paper aims to produce the first empirical estimate of the effects of the minimum wage so that the discussion is informed and policy decisions are made based on the evidence.

The paper is structured as follows. The next section provides an overview of the literature analysing the relationship between the minimum wage, employment, poverty, and inequality. Section three describes the minimum wage context in BiH to give a better understanding of the empirical findings. Section four describes the model, data, and empirical strategy, and section five discusses the empirical results of the model estimation. Finally, section six concludes and provides policy recommendations.

2. LITERATURE REVIEW

There is much socio-economic debate on the redistributive effect of the minimum wage and its potential (or lack thereof) to reduce poverty and inequality. A growing body of literature explores the effect of the minimum wage on poverty and inequality as well as other consequences such as employment incentives and changes in employment and the price of goods and services. These studies reach different conclusions regarding the size and magnitude of the effect of the minimum wage. According to Moore et al. (2009), there are two main views regarding the minimum wage and its impact. The advocacy view holds that setting a fair wage can improve the economic well-being of those earning below the minimum wage, who are generally the uneducated and unskilled. However, critics argue that the negative employment effects may be large enough to offset the benefits gained from the additional income. They claim that the minimum wage does not benefit those outside the labour market such as the elderly, disabled, and unemployed. This is of particular relevance in the BiH, which has a large number of ‘outsiders’. Moreover, the presence of ‘envelope wages’ (cash in hand) means that the minimum wage only increases the gap¹ between ‘insiders’

¹ Available evidence (e.g. Vladisavljević et al., 2107) suggest that the public sector wage premium in the Western Balkans is positive and significant.

in the public sector who are not paid part of their wage in cash and ‘outsiders’ in the private sector who often are.

The effect can also vary according to the level of labour market development, including issues such as the presence of informal employment and an undeveloped social safety net. Gindling (2014) argues that increasing the minimum wage has a positive but modest impact in developing countries, because the statutory minimum wage applies to only a minority of impoverished workers and does not cover workers in the large informal sector. Among poor households, raising the minimum wage creates losers as well as winners: depending on wage distribution and the effect of the minimum wage on employment of the household head, some are pulled out of poverty while others are pushed into it. Raising the minimum wage should be part of a comprehensive poverty-reduction package but should not be the only, or even the main, tool to reduce poverty. Gindling finds that the magnitude of the effect depends on the difference between the average and the minimum wage. For example, when the minimum wage is low relative to the average wage (as in Brazil and Mexico), it tends to raise the wages of workers at the bottom of the wage distribution. However, when the minimum wage is high relative to the average wage (as in Colombia), it increases the wages of workers in the middle of the wage distribution but not those at the bottom.

Redistribution theory (Freeman, 1996) posits that raising the minimum wage operates through three different mechanisms: it increases the price of goods and services produced by minimum-wage employees, it decreases stakeholder profits at the higher end of the wage distribution while raising the incomes of the low-wage workers, and it acts as a price floor in the labour market, increasing the unemployment of minimum wage workers. However, Atkinson et al. (2015) argue that increased income inequality is not inevitable and can be reversed, and to this end they set out a range of concrete proposals for the UK which are tested using EUROMOD. The analysis of their likely impact on inequality and poverty yields insights of much broader relevance. In particular, one solution they propose is making the design of income tax and social insurance contributions more progressive, and they compare the role of means-tested, social-insurance-based, and universal cash transfer payments.

One explanation offered for the different estimated effects of a change in the minimum wage is that it depends on the composition of the family. The effect is different depending on who is the main breadwinner, whether he/she is a low- or high-skilled worker, and whether family members are eligible for certain social benefits depending on their disposable income. Advocates of the minimum wage argue that introducing or increasing a minimum wage at least gives low-wage earners sufficient income to support a decent life. However, they do not always take into account the fact that low-wage earners are usually not the main breadwinners but are spouses or young adults living with their parents.

3. BACKGROUND: THE MINIMUM WAGE IN BIH

The tax-benefit system in Bosnia and Herzegovina was developed under very specific circumstances. It was based on the institutional and legal framework inherited from Yugoslavia and developed in unfavourable socio-economic circumstances (civil war, dissolution of Yugoslavia, transition, etc.), with interventions by various international actors (Arandarenko, 2004). The transformation of the ideological system and total disassembly of the political system resulted in a new organisational and functional system matrix.

According to the BiH constitution (established in the Dayton Peace Accord), tax and social policies are under the exclusive jurisdiction of the lower levels of government – the two entities and the cantons. Institutions at the state level have only a limited coordinating role. The entities of FBiH and RS have different income taxation and social security contribution systems, while citizens in Brcko District can decide which system their income is taxed under. The governments of each entity define the main benefit policies, while others are defined by the lower administrative units (cantons, cities, municipalities). Personal income tax in both entities is flat at 10%. In FBiH both employers and employees pay social security contributions, while in RS they are only paid by employees.

The minimum wage policy is also different in each of the two systems. In the FBiH it is set as the minimum net hourly wage, and in the RS it is set as the minimum net monthly wage. There have been several periodic changes in the minimum wage in both the FBiH and the RS, usually implemented at the end of the year and coming into force in the following year. In the FBiH the first minimum wage was established in August 2005 through the General Collective Agreement, set at the

level of a net hourly wage of BAM²1.75, which was then around 55% of the average net salary. In 2008 the level of the minimum wage was changed to a net hourly wage of BAM 1.95. In the last change in FBiH in 2016, the General Collective Agreement increased the level of the minimum wage from a net hourly wage of BAM 2.05 to BAM 2.31.

There were similar changes to the minimum wage in the RS. In the RS the minimum wage was first introduced in 2006 at BAM 205.00 per month, or about 40% of the average salary. Different to FBiH, the minimum wage is, set in relation to the average monthly wage with corrections every year. The two most recent changes (included in the scenarios used for estimation of the effect in the empirical chapter) were a minimum wage increase from BAM 370.00 to 395.00 in 2016 and an increase of the minimum monthly wage from BAM 440.00 to 450.00 in 2019.

Increasing the minimum wage level as a percentage of the average monthly wage follows similar developments in the Western Balkan region. All countries in the region have a legal minimum wage policy. Moreover, all countries, except Kosovo, increased the level in the period 2015–2019. According to a World Bank report (2020),³ in July 2019 the minimum wage was raised for the first time since 2013. At the beginning of 2019, minimum wages in the region – as a percentage of the average monthly wage (expressed in euros) – were diverse and ranged between 28% in Kosovo and almost 50% in Albania, North Macedonia, and Serbia.

² BAM is code for the convertible mark, a BiH national currency, set at a fixed exchange rate to euro at 1.95583 BAM for 1 euro.

³ <https://wiiw.ac.at/western-balkans-labor-market-trends-2020-dlp-5300.pdf>

Table 1: Minimum wage as a percentage of average monthly gross wage on 1 January, 2015 and 2019

Country	2015	2019
Albania	45.8	48.3
Montenegro	39.7	37.3
North Macedonia	42.0	46.4
Serbia	46.4	48.4
Kosovo	33.3	28.3
Bosnia and Herzegovina: FBiH*	43.0	43.3
Bosnia and Herzegovina: Republic of Srpska*	44.5	49.5

*Data for Bosnia and Herzegovina data are calculated based on average net monthly wage

Source: <https://wiiw.ac.at/western-balkans-labor-market-trends-2020-dlp-5300.pdf> *Authors' own calculations for data for Bosnia and Herzegovina, based on official statistics.

The increasing trend of average and minimum wages in both entities suggests that the minimum wage changed following an increase in the average wage. The share of minimum wage in the average wage is fairly stable over time and is around 50% in both entities. As governments in both entities continue to discuss future changes in the minimum wage level, we hope that the evidence presented in this paper will be useful and will inform decision-making as well as the broader public policy debate.

4. EMPIRICAL STRATEGY

As described in the literature review, a variety of methods is used to estimate the effect of changes in the minimum wage. In this paper the effect of increasing the minimum wage on poverty and inequality is calculated using BiHMOD, a microsimulation model for ex-ante evaluation of tax and social benefit policy changes, based on EUROMOD. EUROMOD-based national models have frequently been used to estimate the effects of the minimum wage in other countries, including Belgium (Penne et al., 2019), North Macedonia (Petreski & Kosovska, 2018), UK (Atkinson et al., 2017), Romania (Popescu et al., 2017), and Serbia (Randelović & Žarković Rakić, 2012).

BiHMOD⁴ is designed to assess the expected effects of changes in different socio-economic policies on household well-being and work incentives. It is a static microsimulation model and as such produces ‘day-after’ effects of policy changes. The model uses the latest available data from the Household Budget Survey (HBS) and programmes a set of policy variables that are run on the data to estimate the effect of policy changes. The HBS⁵ is a national household-level survey focusing on households’ final consumption expenditure. The last survey was conducted in 2015 and this dataset is included in the model. The HBS⁶ survey asks a representative sample of households in BiH a set of questions that allow simulation of policy changes, including questions on their demographic characteristics; their education and labour market status; their expenditure pattern, income amounts, and sources; and their social benefits. Income in the survey is presented as the net monthly wage, and this requires net-to-gross imputation of wages. For FBiH the model currently simulates the following means-tested benefits: child allowance, benefits for unemployed mothers, benefit for equipment for new-borns, up to 6 months’ benefit for child nutrition, and permanent financial assistance for the disabled. For RS the simulated benefits include child allowance, benefit for equipment for new-borns, benefits for the third and fourth child in the family, and permanent financial assistance for the disabled.

In order to calculate hourly wages as used in the minimum wage legislation in FBiH, the monthly wage of full-time employees was divided by the average number of hours (40 hours per week). We excluded part-time employees because there is no data on the actual number of hours worked in the HBS survey dataset, and imputation of 25 hours per week as an average did not perform well in the model because it was not possible to distinguish between minimum-wage workers and part-time employees earning high hourly wages. Employees who reported that they received income for full-time employment but did not want to report the amount (around 10%) were also excluded. Reported incomes below the minimum wage for full-time employees (around 10%) were bottom-coded by

⁴ More about the model at: <https://credi.ba/en/bihmod/>

⁵ http://www.bhas.ba/saopstenja/2017/HBS_Final_17042017_bh.pdf

⁶ BiHMOD uses HBS instead of SILC (Survey on Income and Living Conditions), which is the data source for most other national EUROMOD-based models, since the SILC is not yet conducted in BiH.

replacing these values with the minimum wage, since the law does not allow paying workers a wage that is below the minimum wage level. We also dropped all observations from Brcko District, since the data does not allow us to identify workers by the taxation applied (either FBiH taxation or RS).

Following the methodology used in Atkinson et al. (2017), the impact of reforms on income inequality is assessed first in terms of the main inequality measures, such as the Gini coefficient, Atkinson measures (with the inequality aversion parameter set at 0.5), the mean log deviation, and the Theil index. Employing a variety of inequality measures provides more complex information, since each result offers a specific perspective. The impact on poverty is assessed in terms of the headcount ratio, with the relative income threshold set at 50% of median household disposable income (adjusted for household size using the modified OECD equivalence scale). Poverty gap measures, reflecting the distance of poor individuals from the income threshold, are also used to capture the impact on poverty, measuring not only the number of those moving above or below the threshold, but also the impact on individuals who remain below the poverty threshold but whose incomes still increase.

Before presenting the results for the poverty and inequality measures, we provide a brief descriptive analysis of the sample. The following table presents the structure of the sample by educational level.

Table 2: Structure of the sample by educational level (%)

Structure by educational level (%)	
Not completed primary	26.87
Lower-secondary ⁷	19.69
Upper-secondary	44.14
Post-secondary	0.45
Tertiary	8.86

Source: Own calculation using BiHMOD

⁷ There is no level of completed primary education because according to the legislation a degree cannot be obtained after primary school graduation.

The above table shows that the largest percentage has attained secondary education, while the smallest percentage is those with post-secondary education. With regards to the structure by industry sector, the highest percentage is employed in the high-skill services sector and the smallest in the sector ‘Mining, Manufacturing, and Electricity, Gas and Water supply’. The structure by industry sector is presented in Table 3.

Table 3: Structure by industry sector (%)

Structure by industry sector (%)	
Agriculture	18.82
Mining, manufacturing, electricity, water supply	0.16
Construction	2.95
Low-skill services sector	34.20
High-skill services sector	43.87

Source: Own calculation using BiHMOD

The income from employment in the sample is distributed as presented in Table 4.

Table 4: Distribution of taxable income from employment

Decile	Percentage	Cumulative percentage	Mean income in decile
1	15.80	15.80	359.12
2	5.49	21.29	441.69
3	9.60	30.89	495.92
4	14.54	45.43	581.98
5	4.57	50.00	644.73
6	10.57	60.57	712.59
7	9.44	70.01	798.26
8	14.27	84.28	943.26
9	7.05	91.32	1148.91
10	8.68	100.00	1814.51
Total	100.00		766.32

Source: Own calculation using BiHMOD

The analysis of income from employment presented in the table above shows that on average around 16% of persons had a monthly income equal to or below BAM 360.00, representing minimum wage earners. It is worth noting that around 70% of the distribution had a monthly income from employment equal to or lower than around BAM 800.00, representing average wage earners in 2015.

The model is validated using the population weights from the HBS 2015 dataset. The estimates from the model were compared with the official statistics on government revenues and spending published in 2015. The comparison is presented in Table 5.

Table 5: BiHMOD macro-validation results

Indicator	Administrative records	BiHMOD	Ratio (BiHMOD/ Administrative data)
Average wage	830.00	763.30	0.92
Personal income tax (in bill. BAM)	0.56	0.38	0.68
Social security contributions (in bill. BAM)	4.31	2.89	0.67
Benefits (in bill. BAM)	5.62	3.17	0.56

Source: Own calculation using BiHMOD and www.bhas.gov.ba

As we can see by comparing official figures and the model estimates, the model produces an average wage that is 8% lower than that published by the BiH Statistics Agency. The simulated amount of personal income tax in the BiHMOD is estimated at the level of 68% of the amount collected by the Tax Authorities. It should be noted here that the net-to-gross imputation procedure is only implemented on the reported wages, while the tax deductions for dependent family members could only be computed for the household heads because the data used did not allow links to other family members in the household. The same applies for the underestimation of social security contributions by around 33% compared to the administrative data.

5. RESULTS

The results of the estimation of the effects of minimum wage changes are presented below. Two baselines and two simulation scenarios are used for each entity. The first scenario is the recent change in the minimum wage, where the previous minimum wage level is programmed in the baseline scenario and the recent change from BAM 2.05 to 2.31 net hourly wage in FBiH and from BAM 370.00 to 450.00 net monthly wage in RS are used to estimate the effect of recent changes in the minimum wage. The second scenario simulates the proposed increase of the minimum wage in FBiH to 50% of the average wage. Because the minimum wage in RS is already above 50% of the average wage we applied the same percentage increase as proposed in FBiH, which is 10%. In the second simulation the proposed net hourly wage in FBiH increases from BAM 2.31 to 2.55, while in RS the monthly minimum wage increases from BAM 450.00 to 495.00. The estimation results of the distributional impact of the two scenarios are presented in the remainder of this section. The first estimate provides empirical evidence of a recent and actual change in the minimum wage that is still policy-relevant, and the second estimate provides empirical evidence for a change that is being considered and which can be used to support the decision-making process.

5.1 Estimated effects of the recent increase in the minimum wage level

First, we present the results from the estimation of the effects of an increase in the minimum wage in scenario 1. The results presented below show the estimated distributional effects of the actual increase in the minimum wage that occurred in 2016 in FBiH and in 2019 in RS.

Table 6: Results of simulation 1

	Baseline 1	Simulation 1
Number of persons below poverty line	771,306	765,940
Poverty rate (%)	26.34%	26.15%
Gini coefficient (total disposable household income)	0.39248083	0.39250919
Atkinson index	0.204983	0.205003

Source: Own calculation using BiHMOD

The estimates from the BiHMOD model suggest that the recent increase in the minimum wage resulted in a reduction in the poverty rate of 0.19pp, and a slight increase in inequality measured by both the Gini coefficient and Atkinson index.

We present descriptive statistics of the sample of minimum wage earners in Table 7.

Table 7: Descriptive analysis of minimum wage earners in simulation 1

		Baseline 1	Simulation 1	Change (Simulation 1 – Baseline)
Number of minimum wage earners		27,072	80,484	53,412
As a share of full-time employees		3.6%	10.7%	7.1
Number of minimum wage earners who are household heads		8,568	26,744	18,176
Number of social assistance recipients		750,886	738,305	-12,581
Average number of household members		3.89	3.86	N/A
Structure by educational level (%)	Not completed primary	2.02	1.03	-0.99
	Lower-secondary	16.67	15.98	-0.69
	Upper-secondary	73.23	74.40	1.17
	Post-secondary	0.00	0.17	0.17
	Tertiary	8.08	8.42	0.34
Structure by industry sector (%)	Agriculture	6.36	6.21	-0.15
	Mining, manufacturing, electricity, water supply	0.00	0.40	0.40
	Construction	1.73	2.40	0.67
	Low-skill services sector	41.62	40.28	-1.34
	High-skill services sector	50.29	50.70	0.41

Source: Own calculation using BiHMOD

As expected, the increase in the minimum wage results in an increase in the number of minimum-wage earners. Around one-third of minimum-wage earners are household heads with on average 3.8 members in the household. Minimum-wage earners with upper-secondary educational level are most affected by the change. Increasing the minimum wage level reduced the number of social benefit recipients, since a significant number of those became socially excluded: changing the level of the minimum wage without modifying the eligibility for receiving social benefits leads to the exclusion of more than 12,500 individuals. Given that this policy change affected a large number of household heads who were the main breadwinners in households that were in receipt of social benefits, these results suggest that any social policy debate, including additionally increasing the minimum-wage level, should be considered carefully and in connection with other policies.

5.2 Estimated effects of the proposed increase in the minimum wage level

To produce evidence relevant to this debate the second simulation estimates the potential effects of a new increase in the level of the minimum wage for both entities. In this scenario the minimum wage, according to the current proposal, is increased from the current level of BAM 2.31 of the net hourly wage to BAM 2.55 in FBiH and from BAM 450.00 to 490.00 of the monthly wage in RS. Results of baseline 2 and simulation 2 are presented in Table 8.

Table 8: Results of simulation 2

	Baseline 2	Simulation 2
Number of persons below poverty line	765,940	759,946
Poverty rate (%)	26.15%	25.95%
Gini coefficient (total disposable household income)	0.39250919	0.39097591
Atkinson index	0.205003	0.204214

Source: Own calculation using BiHMOD

The results presented above suggest that a further increase in the minimum wage will further reduce the level of poverty. Moreover, it will have an impact on income inequality, as seen in the slight decrease in the Gini coefficient. A descriptive analysis of the sample of minimum wage earners in the second simulation is presented in Table 9.

Table 9: Descriptive analysis of the minimum wage earners in simulation 2

		Baseline 2	Simulation 2	Change (Simulation 2 – Baseline 2)
Number of minimum wage earners		80,484	88,177	7,693
As a share of full-time employees		10.7%	11.7%	1.00
Number of minimum wage earners who are household heads		26,744	29,112	2,368
Number of social assistance recipients		738,305	737,747	–558
Average number of household members		3.86	3.88	N/A
Structure by educational level (%)	Not completed primary	1.03	0.94	–0.09
	Lower-secondary	15.98	15.81	–0.17
	Upper-secondary	74.40	74.96	0.56
	Post-secondary	0.17	0.16	–0.01
	Tertiary	8.42	8.14	–0.28
Structure by industry sector (%)	Agriculture	6.21	6.38	0,17
	Mining, manufacturing, electricity, water supply	0.40	0.36	–0.04
	Construction	2.40	2.37	–0.03
	Low-skill services sector	40.28	40.62	0.34
	High-skill services sector	50.70	50.27	–0.43

Source: Own calculation using BiHMOD

The estimated change in the number of new minimum wage earners is smaller than in the case of simulation 1 and compared to baseline 1. Again, as expected, most of the minimum-wage earners that are most affected by the change have an upper-secondary educational level. Moreover, it should be noted that a new, additional increase in the minimum wage socially excludes even more people. Nevertheless, the effects are smaller than in the first simulation.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

The issue of the minimum wage is widely debated in BiH, despite contrasting theoretical predictions and a lack of empirical evidence. This paper produces the first estimates of the distributional impact of changes in the minimum wage using a static microsimulation model and estimating the effects of both recent and proposed changes. The evidence produced in this paper proffers helpful empirical evidence and insights for the policy debate and for further research on the effect of the minimum wage in BiH.

The results presented in this paper show that increasing the level of the minimum wage positively impacts poverty and inequality. As such, the institution of the minimum wage can be used as a tool for reducing both poverty and inequality in BiH. However, the paper suggests that the minimum wage should not be used as a stand-alone tool but should be designed in coordination with other social and employment policies. Otherwise, the results presented here show that it will produce higher levels of social exclusion. After increasing the level of the minimum wage, decision-makers should consider changing the eligibility criteria for social benefits, as some families may be excluded but still in poverty.

This research has some limitations resulting from the data used and the estimation approach. The results are produced using a static model and do not take into account behavioural responses of employers and employees with regards to working hours and envelope wages. Changing the minimum wage level may also have a spill-over effect on the wages of other workers, especially in the public sector, since their wages are often calculated based on ‘coefficients’ linked to the minimum wage or on the average wage, which is affected by an increase in the minimum-wage level.

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Received: April 13, 2020

Accepted: September 25, 2020

