

NEW APPROACH TO ESTIMATING MACROECONOMIC DETERMINANTS OF INFORMAL EMPLOYMENT

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ABSTRACT

Informal employment is a less favourable type of employment whose levels policy makers usually want to decrease and move these workers in the formal part of the labour market. It is more commonly found in LDCs and in developing economies, than in developed ones. This paper uses a cross-section multiple regression analysis to check the effects of multiple macroeconomic variables on the size of the informal labour market. The sample is made out of economies for which ILO has published data about the share of employment outside the formal sector, excluding the economies that receive aid from IDA, using 2017, 2018 and 2019 data from the International Labour Organization and other international organizations. Results show that macroeconomic variables do not have significant explanatory power, except for unemployment rate, exports and GDP growth rate.

Keywords: *informal labour, informal work, shadow economy, labour, macroeconomics, developing economies, globalisation.*

1. INTRODUCTION

Employment and its levels are of economists' interest from the very beginning of economics as a scientific discipline. However, employment can take various forms of which some are more desirable than others, since the form of employment can have different repercussions on both the workers as individuals, but also on an economy as a whole. The reason for this lies in the fact that some types of employment put the worker in a much more preferable position, providing them higher levels of workers' rights and protection. Another reason why this issue is of concern for policy makers and researchers is that different types of employment also differ in their tax contributions, which affects the level of government income and leaves space for potential tax evasion.

Many different types of employment can be found, especially with the evolution of the labour market that happened with digitalization and changes that it brought to economies. It did not only create new jobs, in terms of tasks that are being done by the workers, but it also created new forms of employment, which have not existed before. On the other side, non-standard forms of employment also exist due to multiple reasons, either in struggling or developing economies or in economies with a high degree of labour market liberalization. Gunther and Launov (2012) state that the topic of informal employment has emerged as a topic again in 1990's especially in developing countries and became one of focus points of international development, as it the informal sector is often characterized as the economy of the poor. Informal employment has from that moment been on the rise, not only in proportion of informal workers in total employment, but also in the types of

informal employment [Hussmanns \(2004a\)](#).

[Schneider et al. \(2010\)](#) define the informality in an economy as a set of legal activities i.e., a market based production and sales of goods and services that are not prohibited, but are hidden from tax, compliance and other authorities. This definition is widely used both by researchers and international organizations such as international labor organization (The ILO from hereon) and others. According to ILO's department of statistics, these jobs lack basic social or legal protections or employment benefits and may be found in the formal sector, informal sector or households ([ILO, 2011](#)). The World Bank divides informality into two types, the first being informal employment and the second informal firms ([ILO \(2018a\)](#) as cited in [World Bank \(2019\)](#)). This research focuses on informal employment, which is the engagement of individuals in the informal labour market. Informal employment comprises both of workers in the informal sector and informal workers outside of the informal sector, as explained by the ([ILO, 2018b](#)). [Hussmanns \(2004a\)](#) defines informal employment as:

Employment in the informal sector includes all jobs in informal sector enterprises or all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or a secondary job.

The ILO considers the consequences of work in the informal sector, or informal work in the formal sector on individuals. They explain that individuals who are informally employed are often underpaid, have lower levels of access to public services and social protection programs and face lower levels of safety in the workplace ([ILO, 2018b](#)). As mentioned previously, work in the informal sector does not only have consequences on individuals. Since this work goes, or at least tries to go under the radar of authorities, it is not taxed as formal work, so it is in their focus for two reasons. First, to ensure adequate human i.e. workers rights. Second, to prevent tax evasion, which also incentivises informal work.

For the purpose of this research, the reason why someone engages in informal work activities will be disregarded. Its goal is to provide insights into the drivers of informal work, measured by its size. In the paper I will try to identify what are the macroeconomic indicators that correspond to high or low levels of informal employment in an economy. Informal employment is greater in developing economies, however, it is important to mention that informal work is also present in developed economies, such as Australia, which in 2019 had nearly 24 percent of workers working outside the formal sector. This is a higher level from, e.g., in Bosnia and Herzegovina or Serbia. Another important note to make is that there are substantial differences among developing economies in levels of informal work, which is one of the main motives for conducting this research. World Bank's income approach is used to differ low income, IDA economies.

Building upon the previously mentioned, this paper tries to offer an insight into why there are such differences between countries when it comes to the proportion of informal labor in total labor. In contrast to other studies, this uses a greater set of macroeconomic and social variables as explanatory variables. Most previous studies use only unemployment rate and tax burden, even though one of the common assumptions is that rise in productivity, i.e. GDP growth, correlates to a decrease in the proportion of workers working outside the formal sector.

The paper is structured as follows: first I will cover recent and fundamental literature on this topic, then explain data sources for the empirical analysis and set an econometric model. Then I will present the result of the analysis and discuss them, together with explaining their consequences. Finally, I will provide some policy recommendations for tackling informal work.

2. LITERATURE REVIEW

Informal employment is a segment of shadow economy that has long attracted the attention of both academics, policy makers and governments, as well as international institutions. The concept of shadow economy follows two lines. The first one is hidden i.e., informal employment and the second one is hidden enterprises and their activity. Researchers have focused more on shadow

economy as a whole, but since informal employment is its vital part, concepts and methodologies are thoroughly researched. Even when informal employment is researched separately, it is more often done on a microeconomic level, explaining why individuals enter informal labor markets. Thus, many papers analyse social factors that are not macroeconomic, such as religion or education, as in the paper by [Günther and Launov \(2012\)](#). There is a significant gap in literature when it comes to macroeconomic factors that drive the size of informal employment in an economy, i.e., why some countries have a higher proportion of informally employed persons than others. This gap is especially present in terms of researching macroeconomic explanatory factors, such as GDP or productivity growth rates, unemployment rates, etc.

[Jütting et al. \(2008\)](#) define informal employment as work outside the regulatory framework which are not subject to labour legislation, social protection, taxes or employment benefits. They analyse China and Mexico in this paper and find a paradox that in Mexico informal employment is linked to low productivity, while in China it is linked to high productivity and a dynamic labor market ([Jütting et al., 2008](#)). Some other authors also mention the link between informal employment and low productivity, but also low level of health and safety conditions ([Mastilo, 2015](#)). In the same paper, they also explain that informal employment has been linked to the global capitalism developments lately and the involvement of these countries in the global economy, i. e. their integration in global production, trade and finance. [Khuong et al \(2021\)](#) provide insight into the state of informal employment and its relationship to economic growth, where they find that high levels of informal employment impede economic growth, however they did not go in the opposite direction to estimate effects of growth on informal employment.

Informal employment has come in focus again with the COVID-19 pandemic, which contoured new forms of employment and labour market. The effects of the pandemic on the labour market were especially strong in services sector, in which companies that adjusted to new conditions flourished, as did the number of their employees, while others that failed to adapt faced significant problems, i. e. their workers did ([Fabris 2022](#)). [Webb and McQuaid \(2020\)](#) state that informal employment levels have risen with the pandemic, despite the confronted interests of informal workers, who were not included in social security programmes developed to offset the effects of the pandemic, and employers, who wanted more flexibility in a volatile working environment.

[Kucera and Roncolato \(2008\)](#) have published an overview of the empirical work on informal employment. Urbanization as a consequence of development and industrialization is one of the drivers of informal work as they find, since many workers come to cities looking for any employment opportunity and take jobs that are outside the formal market ([Kucera and Roncolato, 2008](#)). They suggest that countries should run a careful urban-rural policy mix to avoid having urbanization that pushes workers into the informal labor market.

[Williams and Lansky \(2013\)](#) explain that direct methods of measurement of the informal sector are more suitable for developing economies, in contrast to the developed countries, where informal work is much more hidden. One such method are labor force surveys, from which the data is used as a measure of the proportion of the informal employment in this paper. They add that indirect methods produce higher results than direct ones ([Williams and Lansky, 2013](#)).

[Mikulic and Nagyszombaty \(2013\)](#) examined the unofficial economy in newly accessed European Union member states using estimates from the MIMIC method and Eurostat's estimates as dependent variables, while using an extensive set of independent variables, most of them being of macroeconomic nature. Findings from this paper suggest that overall tax burden is significant in explaining the unofficial economy, however individual taxes are not; economic development and GDP growth rate is also significant as economic downturns increase the unofficial economy; level of corruption is significant too in their model ([Mikulic and Nagyszombaty, 2013](#)). There is an unclear opinion here about the role of economic freedom and these authors do not state clearly what is its role, but suggest this variable needs further modifications.

[Bernab`e \(2002\)](#) develops a conceptual framework for studying the informal employment in transition economies, which are today still mostly in the middle-income group according to the

World Bank's income methodology. One of the main challenges that he finds in researching the informal employment in these countries is the measurement of the size of the shadow economy and then states that labor force surveys are a good way of obtaining data for desk research (Bernabe, 2002). She puts informal workers into multiple groups, of which there are own account workers, workers without stable contract, seasonal workers and the so-called left-hand workers. This author also conducted empirical research of informal labour in Georgia. He concludes that informal work is more frequent with women, that majority of private sector is informal and that agriculture has the highest proportion of informal workers (Bernabe, 2002). However, this framework does not explain macroeconomic factors, such as productivity or inequality that drive informal employment. Furthermore, the transition from centrally governed to market economy has ended in most economies, especially European, that have undergone this process.

Rosenbluth (1994) argues that informal employment is more present in struggling economies, i. e. economies that are struggling with economic growth. However, this author further explains that informal employment is not only for the poor (workers or countries) (Rosenbluth, 1994) since one of the reasons for entering the informal employment is also tax evasion. This leads to GDP growth rate and taxation system variables being potential explanatory variables for the proportion of informal employment.

Buehn and Schneider (2012) use the MIMIC method to estimate the factors that drive the shadow economy and this model can be partially applied to the analysis of the proportion of informal employment, i. e. to finding what are the macroeconomic factors that increase it. These authors used business and fiscal freedom, tax burden, government size and effectiveness, as well as unemployment rate as regressors in their model (Buehn and Schneider, 2012). They find that economic freedom in general decreases the size of the shadow economy and that government size and tax rates drive the size of the shadow economy up as these explanatory variables increase.

Schneider et al. (2015) used the MIMIC method for estimating the shadow economy in 11 Central and Eastern European countries and have thus used multiple macroeconomic variables as causal variables in the model. These included indirect and direct tax revenue as percent of GDP, unemployment and self-employment rate, marginal income tax burden in percent, effective average tax rate in percent, regulatory quality index, rule of law, corruption index (Schneider et al., 2015). What these authors found was that the rule of law, corruption, taxation and unemployment rate play a significant role in determining the size of the shadow economy in these countries. In another study Dreher and Schneider (2010) state that the objective index of corruption is a complement of unreported or underreported economic activity, especially as level of income in a country declines. Chowdhury et al. (2005) modelled informal employment in Bangladesh (dependent variable values calculated from the labour force survey) using the following explanatory variables: voice and accountability; political instability and violence; government effectiveness; rule of law; business regulation; rigidity of employment index; minimum capital for starting any business measured as percent of income per capita; total population of the country; GNIPC is gross national income (GNI) per capita (in US dollars); irregular payments; corruption; marginal tax rate and government intervention in the economy. These variables were included in 3 models and in only one of them marginal tax rate and government intervention were not significant, while all other variables are statistically significant (Chowdhury et al., 2005). Bonnet, Vanek and Chen (2019) define poverty, education and labour force age as significant determinants of the proportion of informal employment. Poverty, that can be considered a macroeconomic variable, affects informal employment directly so that countries with higher proportion of poor households have higher proportions of informally employed workers.

Most other authors do not use macroeconomic and policy-related variables as causal variables. Instead, they try to explain what is that makes an individual or an enterprise enter the shadow economy or informal employment. One such paper explains the size of the shadow economy in Baltic countries and explains that it is determined by company's stance on the tax system, satisfaction with

the government and public services, etc. [Putnins and Sauka \(2011\)](#). However, these explanatory variables often depend on other social aspects, such as culture and history and are not suitable for use in a study that does a cross country comparison. In studies that do use macroeconomic variables as explanatory, measures of capital used for work and additional measures of productivity and integration in the world economy are not used, which is a gap that this paper is trying to bridge.

3. METHODS

For the purpose of this paper, data was retrieved from multiple sources. These are ILO's database (ILOSTAT) and databases of the World Bank and the IMF. A sample is made out of 46 countries that do not belong to low-income group, in three years: 2017, 2018 and 2019. This is the largest sample of countries for which both ILO and the World Bank have published data used for in the model. Later years have not been used due to disruptions in the economy as a whole caused by the COVID-19 pandemic, whose effects are yet to be fully estimated and understood. Since this is a fundamental research paper, 2020 and 2021 data are assessed to be too volatile and therefore are not used in this study. For the classification of countries as developing, World Bank's income methodology was used: countries with two middle income levels are considered to be developing. Countries that are included in the analysis are: Armenia, Argentina, Australia, Bosnia and Herzegovina, Bangladesh, Brazil, Brunei Darussalam, Colombia, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Egypt Arab Republic, Ecuador, El Salvador, Honduras, Guatemala, Indonesia, Jamaica, Jordan, Kyrgyz Republic, Mexico, Mauritania, Mauritius, Mongolia, Myanmar, North Macedonia, Nepal, Panama, Paraguay, Peru, Russian Federation, South Africa, Seychelles, Serbia, Senegal, Sri Lanka, Thailand, Turkey, Uganda, Vietnam, and Zambia.

To measure the proportion of the informal employment i.e. the dependent variable, ILO's data was used. This method differs from the widely used MIMIC method which indirectly measures the size of the shadow economy (which could be used to measure the scale of informal employment) since the estimate of informal employment is directly measured with surveys (household survey, income survey, labor force survey, etc). Analysis is implemented on harmonized data variables, considering the unified data sources. The data source for the dependent variable is ILOSTAT, and for independent variables, World Bank data is used. To improve comparability across countries, ILOSTAT recalculates national data according to their methodology ([ILOSTAT, 2020](#)). [Schneider and Buehn \(2017\)](#) criticize the survey method because it does not survey companies and there is the risk of surveyees giving false answers.

3.1 THE MODEL

For the purpose of this research two multiple linear regression models were used:

$$y = \beta_0 + \beta_i x_i + c \quad (1)$$

where the dependent variable represents the measurement of the proportion of informal employment. Data is calculated by ILO and represents the percent of men and women who are informally employed as a percent of the total labour force.

For the first model uses explanatory variables $i=1, 2, \dots, 5$

1. Exports (as a percent of GDP)
2. Foreign direct investment, net inflows (percent of GDP)
3. GDP growth (annual percent)
4. Unemployment, total (percent of total labor force) (modeled ILO estimate)
5. Gross capital formation (percent of GDP)

The second model is an extended model that uses the following variables:

1. Inflation, GDP deflator (annual percent)
2. Unemployment, total (percent of total labor force) (modeled ILO estimate)
3. Total tax and contribution rate (percent of profit)
4. Gross capital formation (percent of GDP)
5. General government final consumption expenditure (percent of GDP)
6. GDP growth (annual percent)
7. Foreign direct investment, net inflows (percent of GDP)
8. Exports (as a percent of GDP)
9. Final consumption as percent of GDP

The data source for all of the explanatory variables is World Bank statistics. Estimate was done using robust standard errors with a 95 percent confidence interval in three years.

4. RESULTS

Table 1. Regression results for two models.

Year	Basic model adj. R ²	Extended model adj. R ²	F test
2017	0.1030	0.1455	rejects both models
2018	0.44	0.52	accept both models
2019	0.37	0.46	accept both models

Source: Author's calculation.

There are only three explanatory variables that were found significant in explaining the proportion of the informal employment in countries that the sample is consisted of. Two of these variables are also found in models using the MIMIC method for estimating the size of unreported economy (unemployment and GDP growth rate). In 2019 (table 6) exports and unemployment are significant at 0.95 with negative signs in the first model. In 2018 (table 4) exports and unemployment are also significant at 0.95 confidence with negative sign, while GDP growth rate has a positive sign in the first model. GDP growth is significant in the second model with a positive sign as well. In 2017 joint significance F test rejects both models.

Table 2. 2017 basic model.

Variable name	Coefficient	t	p value
Exports (as a % of GDP)	0.049998	0.32	0.748
FDI net inflow	-0.68408	-0.48	0.637
Annual GDP growth (%)	1.881488	1.07	0.294
Unemployment (% of total labour)	-0.59712	-1.06	0.295
Gross capital formation (as a % of GDP)	-0.66508	-1.33	0.192
cons	64.78467	4.55	0

Source: Author's calculation.

Table 3. 2017 extended model.

Variable name	Coefficient	t	p value
Inflation	-0.40645	-0.56	0.581
Unemployment (% of total labour)	-0.68477	-1.05	0.303
Total tax and contribution rate of profit	-0.0546	-0.23	0.82
Gross capital formation (as a % of GDP)	-0.38776	-0.6	0.555
General gov. final consumption (% of GDP)	-0.48939	-0.48	0.634
Annual GDP growth (%)	1.069257	0.51	0.615
FDI net inflow	-0.42536	-0.28	0.781
Exports (as a % of GDP)	0.056329	0.33	0.746
Final consumption (% of GDP)	0.339217	0.86	0.395
cons	44.57065	0.97	0.338

Source: Author's calculation.

Table 4. 2018 basic model.

Variable name	Coefficient	t	p value
Exports (as a % of GDP)	-0.3544502	-2.02	0.052
FDI net inflow	-1.248556	-1.09	0.286
Annual GDP growth (%)	4.832923	3.37	0.002
Unemployment (% of total labour)	-1.027023	-2.21	0.034
Gross capital formation (as a % of GDP)	-0.0706892	-0.18	0.858
cons	56.05519	5.06	0

Source: Author's calculation.

Table 5. 2018 extended model.

Variable name	Coefficient	t	p value
Inflation	-0.1956504	-0.43	0.668
Unemployment (% of total labour)	-0.623713	-1.16	0.255
Total tax and contribution rate of profit	0.2386849	1.14	0.262
Gross capital formation (as a % of GDP)	0.4533722	0.84	0.408
General gov. final consumption (% of GDP)	-1.152717	-1.62	0.116
Annual GDP growth (%)	3.793266	2.27	0.031
FDI net inflow	-1.593902	-1.35	0.189
Exports (as a % of GDP)	-0.2487186	-1.26	0.216
Final consumption (% of GDP)	0.1604825	0.53	0.599
cons	35.3824	0.91	0.371

Source: Author's calculation.

Table 6. 2019 basic model.

Variable name	Coefficient	t	p value
Exports (as a % of GDP)	-0.44994	-2.26	0.031
FDI net inflow	-0.66769	-0.64	0.526
Annual GDP growth (%)	2.315135	1.69	0.101
Unemployment (% of total labour)	-1.21185	-2.23	0.033
Gross capital formation (as a % of GDP)	-0.11418	-0.25	0.804
cons	70.03772	5.56	0

Source: Author's calculation.

Table 7. 2019 extended model.

Variable name	Coefficient	t	p value
Inflation	0.089313	0.36	0.721
Unemployment (% of total labour)	-0.85418	-1.38	0.179
Total tax and contribution rate of profit	0.110287	0.54	0.595
Gross capital formation (as a % of GDP)	0.482061	0.64	0.53
General gov. final consumption (% of GDP)	-1.32268	-1.35	0.188
Annual GDP growth (%)	1.240913	1.01	0.322
FDI net inflow	-0.74394	-0.82	0.418
Exports (as a % of GDP)	-0.37601	-1.66	0.108
Final consumption (% of GDP)	0.273337	0.72	0.478
cons	45.17237	0.79	0.437

Source: Author's calculation.

5. LIMITATIONS

There are several limitations of this model. The first one is the dependent variable in terms of quantification of the proportion of informal employment. Even though the data used is from ILO which is the most relevant authority in this field, the very nature of labour force surveys is such that respondents might give false or incomplete answers, especially when it comes to topics such as hidden employment which has its legal consequences. This could potentially lead to underestimation of the size of informal work. Furthermore, data for the dependent variable comes from labour force surveys which are not conducted annually in all countries and thus data on informal employment is not available for a large number of countries. In addition to this, there is a problem of different national treatment of informal employment and classification of jobs that are on the borderline of informal employment, as explained by [Hussmanns \(2004b\)](#). Also, even international standards that are aimed at defining the informal employment are flexible when it comes to applying them, i. e. their definitions to different national economies ([Mehran, 2015](#)).

Another potential issue is the multicollinearity of GDP growth and unemployment rate as the first causes the latter. However, it is important to have both variables to observe what happens

when countries grow in the same pace, but from a different base (lower vs higher unemployment). Finally, sample size is also a constraint that needs to be taken into consideration, however due to lack of data for all countries, analysis is done on the sample of countries with available data. Data availability is problem for both dependent and independent variables, as some variables, such as GINI coefficient or another measure of inequality would be of interest as regressors, however data on any measure of income inequality is scarce and unavailable, especially for non-high-income countries which have a larger proportion of informal employment in total labour.

6. DISCUSSION

Models used in this paper estimated the effect of multiple macroeconomic variables in order to check how they contribute to the proportion of the informal labour in total employment. Models like this are not present in the literature that covers unreported economy and most authors are estimating both the size of the unreported economy (of which informal employment is a vital part). The majority of them use the MIMIC method and microeconomic variables, social attitudes etc. while this paper uses a measure of the informal employment created through a direct method that is suitable for estimating informal work.

There are three variables that were estimated in both models, of which model in 2018 (table 4) and 2019 (table 6) were not rejected by the joint F test. These variables are unemployment rate (total percent of labour force estimated by the ILO); exports of goods and services as a percent of gross domestic product and annual real GDP growth rate. When estimating the size of shadow economy many authors also identified unemployment and GDP growth as important, as shown in the literature review.

GDP growth rate has a positive sign meaning that informal employment rises as the gross domestic product rises, i.e. when productivity rises. One of the reasons for this could be the fact that most of the estimated countries are economies that have middle incomes which usually grow at a faster pace from a small base. In the sample, the vast majority of the countries are from the lower or upper middle income group and their economies are currently developing. The growth they are experiencing is known as catch up growth and they have higher GDP growth rates than developed countries with lower proportions of informally employed.

Because of this, they still have a large number of informally employed persons despite the (catch up) growth. Their labour markets still need time to fully utilize the effects of economic growth and productivity increase. This growth should in perspective decrease the size of informal employment and transfer these jobs to the official economy.

Exports is the second variable with a negative sign meaning that countries that are open to trade and whose exports play a significant role in their gross domestic product have lower informal employment rates. A potential explanation of this could be the fact that many exporting companies in developing countries are owned by foreign enterprises from developed countries with higher workers rights protection standards. These standards are then partially transferred to countries where they own production enterprises and workers employed there work under formal contracts. Additionally, these countries that are more open to trade are often more open to capital and labour movement as well. Due to this, labour movement is in the direction of countries that have higher workers rights standards. In order to keep the labour force companies need to formally employ workers and provide the respect of workers rights. This could be one of the reasons why in countries with a higher share of exports informal work has a smaller proportion.

Finally, the proportion of informally employed workers in the total labour force according to the model is negatively correlated to unemployment rate. This means that the higher the unemployment rate is, the lower is the number of formally employed persons. This is a paradox as in theory, informal employment is associated with workers that cannot find employment in the formal sector. However, this has two additional explanations. The first one is that informal labour is driven by

the tax evasion motive. In order to decrease the proportion of gross wage that is collected by tax authorities, individuals work unreported or underreported and as a consequence the part of their income on which tax rate is applied is lower. However, the tax burden variable is not significant in the regression. Another explanation could lie in the sample, since it is very limited by the scarce data available on this topic, especially about the proportion of informal employment. Also, as mentioned in the limitations part, the number of countries is 46.

It would have purpose to extend this research with a larger sample, however currently this is not possible and there is little certainty about when it will be possible. Without substantial data, all conclusions on this topic cannot be generalized to the entire population i. e. on all countries. Another direction in which this research could be further developed is to estimate the proportion of the informal employment, and not shadow economy, indirectly and use MIMIC method.

7. CONCLUSION

Informal employment is still a scarcely researched topic, especially in the macro perspective. Most research examines why individuals engage in informal working activities and what are their motives and incentives. However even this kind of research is rare and most researchers focus on the shadow economy as a whole.

Informal employment is recognized by the International Labour Organization as a problem, especially in economies that do not belong to the high-income group. This phenomenon causes other problems for economies, both on micro and macro levels. On the micro level, the largest problems lie in the fact that informal workers often work under worse conditions than formal workers and their rights are more often broken. On the macro level, the problem lies in the fiscal sphere since these earnings are partially or completely not taxed. This causes lower income for governments that could be used for improving working conditions through social programs, increased control of labour law implementation or subsidizing companies that invest in workers welfare. Also, informal work is of governments' interest in order to be able to create social policy programs that are better targeted, i.e., more efficient, as there are informal workers in need that are not visible to them, or that are included in social programs because parts of their incomes are hidden but would not be included otherwise.

This issue still needs to be addressed by both academics, governments, unions and international organizations. These stakeholders need to work together to tackle the problem of informal work and move these workers in to the formal zone. Data availability is currently the greatest problem for researchers whose research needs to give answers and policy recommendation for further work do reduce the size of informal employment.

REFERENCES

- Bernabe, S. (2002). Informal employment in countries in transition: A conceptual framework. *LSE STICERD Research Paper No. CASE056*.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1158947
- Bonnet, F., Vanek, J., and Chen, M. (2019). Women and Men in the Informal Economy – A Statistical Brief. Manchester, UK: WIEGO
https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_711798.pdf
- Buehn, A. and Schneider, F. (2012). Shadow economies around the world: Novel insights, accepted knowledge, and new estimates. *International Tax and Public Finance*, 19, 139–171.
<https://econpapers.repec.org/RePEc:kap:itaxpf:v:19:y:2012:i:1:p:139-171>
- Chowdhury, H. U. et al. (2005). Informal economy, governance, and corruption. *Philippine Journal of Development*, 32(2), 103–134.
https://econpapers.repec.org/RePEc:phd:pjdevt:pjd_2005_vol__xxxii_no__2-c
- Dreher, A. and Schneider, F. (2010). Corruption and the shadow economy: an empirical analysis. *Public Choice*, 144(1), 215–238.
<https://link.springer.com/article/10.1007/s11127-009-9513-0>
- Fabris, N. (2022). Impact of Covid-19 Pandemic on Financial Innovation, Cashless Society, and Cyber Risk. *ECONOMICS- Innovative and Economics Research*, 10(1), 73-86.
<https://doi.org/10.2478/eoik-2022-0002>
- Günther, I. and Launov, A. (2012). Informal employment in developing countries: Opportunity or last resort? *Journal of development economics*, 97(1), 88–98.
[10.1016/j.jdeveco.2011.01.001](https://doi.org/10.1016/j.jdeveco.2011.01.001)
- Husmanns, R. (2004a). Measuring the informal economy: From employment in the informal sector to informal employment. Policy Integration Department, Bureau of Statistics, International Labour Office.
https://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/publication/wcms_079142.pdf
- Husmanns, R. (2004b). Statistical definition of informal employment: Guidelines endorsed by the seventeenth international conference of labour statisticians (2003). In *7th Meeting of the Expert Group on Informal Sector Statistics (Delhi Group)*, pages 2–4.
<https://ilo.org/public/english/bureau/stat/download/papers/def.pdf>
- ILO (2011). Statistical update on employment in the informal economy.
- ILO (2018a). *Informality and non-standard forms of employment*. International Labour Office, Buenos Aires.
- ILO (2018b). *Women and men in the informal economy*. International Labour Office, Geneva, Switzerland, 3 edition.
- ILOSTAT (2020). Indicator description: Informality - ilostat.
<https://ilostat.ilo.org/resources/concepts-and-definitions/description-informality/>
 (Accessed on 05/03/2022).
- Jütting, J., Parlevliet, J., and Xenogiani, T. (2008). Informal employment re-loaded. *IDS bulletin*, 39(2), 28–36.
[10.1111/j.1759-5436.2008.tb00442.x](https://doi.org/10.1111/j.1759-5436.2008.tb00442.x)
- Khuong, N. V., Shabbir, M. S., Sial, M. S., & Khanh, T. H. T. (2021). Does informal economy impede economic growth? Evidence from an emerging economy. *Journal of Sustainable Finance & Investment*, 11(2), 103-122.
<https://doi.org/10.1080/20430795.2020.1711501>

- Kucera, D. and Roncolato, L. (2008). Informal employment: Two contested policy issues. *International Labour Review*, 147(4), 321–348.
<http://www.ilo.int/legacy/english/protection/travail/pdf/rdwpaper24c.pdf>
- Mastilo, Z. (2015). Analysis of the unemployment structure of highly educated personnel in the Republic of Srpska and measures for its reduction. *ECONOMICS-Innovative and Economics Research*, 3(1), 21-36.
<https://doi.org/10.1515/eoik-2015-0001>
- Mehran, F. (2015). Are differences in national definitions of informal employment and employment in the informal sector necessary? *WIEGO Statistical Brief No. 14*, 14(sup1).
<https://www.wiego.org/sites/default/files/publications/files/Mehran-National-Definitions-informal-Employment-WIEGO-SB14.pdf>
- Mikulic, D. and Nagyszombaty, A. G. (2013). Causes of the unofficial economy in new eu member states. *Econ. Res.-Ekon. Istraz.*, 26, 29–44.
<https://hrcak.srce.hr/133119>
- Putnins, T. J. and Sauka, A. (2011). Size and determinants of shadow economies in the baltic states. *Baltic Journal of Economics*, 11(2), 5–25.
<https://www.tandfonline.com/doi/abs/10.1080/1406099X.2011.10840498>
- Rosenbluth, G. (1994). The informal sector and poverty in Latin America. *Revista CEPAL*.
<https://repositorio.cepal.org/handle/11362/10483>
- Schneider, F. and Buehn, A. (2017). Shadow Economy: Estimation Methods, Problems, Results and Open questions. *Open Economics*, 1(1), 1–29.
<https://www.degruyter.com/document/doi/10.1515/openec-2017-0001/html?lang=en>
- Schneider, F., Buehn, A., and Montenegro, C. (2010). Shadow economies all over the world: New estimates for 162 countries from 1999 to 2007. *University of Chile, Department of Economics, Working Papers*.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1645726
- Schneider, F., Krstic, G., Arsic, M., and Ranelovic, S. (2015). What Is the Extent of the Shadow Economy in Serbia? In Krstic, G. and Schneider, F., editors, *Formalizing the Shadow Economy in Serbia*, Contributions to Economics, chapter 0, 47–75. Springer.
<https://link.springer.com/book/10.1007/978-3-319-13437-6>
- Webb, A., McQuaid, R. and Rand, S. (2020), “Employment in the informal economy: implications of the COVID-19 pandemic”. *International Journal of Sociology and Social Policy*, 40 (9/10), 1005-1019.
<https://doi.org/10.1108/IJSSP-08-2020-0371>
- Williams, C. C. and Lansky, M. A. (2013). Informal employment in developed and developing economies: Perspectives and policy responses. *International Labour Review*, 152(3-4), 355–380.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1564-913X.2013.00196.x>
- World Bank (2019). *Global economic prospects, January 2019*. World Bank Publications. Washington, D.C., DC.
<https://openknowledge.worldbank.org/handle/10986/31066>