Chapter 2

The Impact of Informal Employment on Growth in Central and Eastern European (CEE) Countries: The Regulatory Role of Institutional Quality

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Abstract

This study analyses the effects of informal employment on economic growth in Central and Eastern European (CEE) countries such as the Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia and Slovenia and also assesses the moderating role of institutional quality factors. In this research, the augmented mean group (AMG) estimator and the heterogeneous panel causality method appropriate for diverse panels are utilized. The study utilizes yearly data spanning from 2007 to 2021. In general, the results show that the coefficient of informal employment is negative and significant, the coefficient of the institutional quality index is positive and significant, and the coefficient of the variable showing the interaction between informal employment and the institutional quality index is positive and significant. Accordingly, it shows that informal employment may negatively affect economic growth, while the institutional quality index may positively affect economic growth. Moreover, the interaction of informal employment and institutional quality index together can support growth in a positive direction. These results emphasise the potential of reducing informal employment, promoting institutional reforms and adopting good governance practices to increase economic growth for economic policy makers in CEE countries.

1. Introduction

Today, the global economic scene focuses on the growing importance of the informal economy and informal employment. The informal economy refers to the part of traditional economic activity that is outside official

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monitoring and regulation, while informal employment refers to labour relations that take place outside official employment records (Buehn and Schneider, 2009). A close examination of these two concepts provides insights into the health, employment status and sustainability of the economy from a broader perspective when their interaction with key economic factors such as economic growth and institutional quality is assessed.

The size and effects of the informal economy have become an important factor to be taken into account in the formulation of economic growth and employment policies. Across a wide range of economies, from emerging to advanced, the growth rate and dynamics of the informal economy play a critical role in assessing the true implications of economic expansion. Likewise, the effects of informal employment affect the health of labour markets and labour force dynamics. Determining actual labour force participation beyond official employment statistics is an important step in assessing the effectiveness of employment policies. An increase or decrease in informal employment can affect the balance of the labour market and the employment performance of the economy (Bölükbaş, 2018; Çelik et al., 2021). Therefore, the size and dynamics of the informal economy and the effects of informal employment on labour markets are among the key factors to be taken into account in the design of economic growth and employment policies. Moreover, reducing the informal economy or controlling informal employment is one of the important steps towards achieving sustainable economic growth and employment growth (Mara et al., 2023). Therefore, understanding the effects of institutional quality and economic growth on informal economy and employment can contribute to the development of more effective economic policies (Kebede et al., 2017; Teyyare, 2018; Dang et al., 2022). Economic growth is a fundamental goal that increases the welfare of a country and raises the standard of living. However, the growth of the informal economy may underestimate the formal economic growth and overshadow the real growth performance. This is because the goods and services produced in the informal sector are not reflected in official data, which means that official growth figures do not fully reflect real economic activity. Institutional quality, on the other hand, includes factors such as government effectiveness, enforceability of legal regulations, levels of corruption and economic freedom. Countries with strong and effective institutional structures can prevent the growth of the informal economy and reduce informal employment. In this context, policies such as effective audit mechanisms and tax reforms can contribute to shrinking the informal economy and increasing economic growth (Acemoglu et al. 2004; North, 2002; Acemoglu and Robinson, 2008).

In this context, this study aims to analyse the effects of economic growth and institutional quality on the informal economy and employment for selected CEE countries. This analysis will help us to better understand how both economic growth and institutional quality factors can impact the magnitude of the informal economy and the structure of employment. The CEE countries - amely Czechia, Estonia, Hungary, Latvia, Poland, Slovak Republic, Slovenia, Poland, Slovak Republic, Slovenia - have continued their economic transformation and development processes rapidly in recent times and gained significance players on the regional and global economic scene. However, the efforts to attain growth and sustainable development goals in the region face some challenges. One of these challenges is the impact of informal employment on growth.

By examining the effects of informal employment on growth in selected CEE countries, this paper aims to highlight the regulatory role of institutional quality and provide important clues for the economic development of the region. This study presents several noteworthy aspects to the existing literature. Firstly, it pioneers an investigation into the correlation between economic growth and informal employment within the context of these seven Central and Eastern European (CEE) countries. Secondly, it introduces an innovative approach by employing Principal Component Analysis (PCA) to compute an Institutional Quality Index. This index is constructed using a set of institutional indicators. Thirdly, it introduces an interaction variable, derived from the obtained Institutional Quality Index and informal employment, which is incorporated into the analysis as an independent factor. Fourthly and finally, this study stands out from its predecessors by employing methodologies that effectively address cross-sectional dependence and country-specific variations across the examined countries.

The structure of this study is organized as follows: Section 2 provides an extensive literature review, Section 3 outlines the applied methodology, Section 4 presents the uncovered findings and subsequent discussions, and, in conclusion, Section 5 offers pertinent policy recommendations.

2. Ampirical Literature

Understanding the implications of informal employment on economic growth and recognizing the influential role of institutional quality in shaping this association holds significant implications for the formulation and execution of economic policies. Consequently, investigating the effects of informal employment on growth and the regulatory function of institutional

quality within this dynamic has emerged as a pivotal research domain within economic literature. This subject is particularly prominent in the context of developing nations; however, it has garnered substantial attention even in developed countries. As a result, a compilation of pertinent empirical studies from the literature is provided under this section, offering a succinct overview of the existing research landscape.

Numerous studies indicate a causal link between informal employment and economic growth, suggesting that informal employment could have an adverse impact on growth. For example, this is emphasised in Bölükbaş (2018). The aim of this study is to investigate the relationship between informal employment, youth unemployment and economic growth in Turkey for the period between 2010M1 and 2017M9. The study's outcomes reveal a bidirectional causal relationship between informal employment and economic growth within the context of Turkey. Additionally, it indicates a unidirectional causal link from economic growth to youth unemployment. Çelik et al. (2021) analysed the long-run and short-run effects of economic growth, unemployment and inflation on informal employment in Turkey for the period 2004-2020 using the ARDL bounds test. The long-run coefficients are statistically significant and a long-run relationship is found between economic growth, unemployment and inflation and informal employment. In the short run, CointEq(-1) 45% of the imbalances are eliminated. A notable finding regarding the correlation between the informal economy and growth is uncovered in the study by Goel et al. (2019). The study examines the impact of informal economy on growth in the formal sector, focusing on economic growth in the United States of America (USA) between 1870 and 2014The results indicate that the informal economy had an adverse impact on economic growth in the period before World War II (WWII), while it played a role in fostering economic growth in the post-WWII era. An important contemporary addition to the exploration of the connection between the informal economy and economic growth and development originates from the research conducted by Mara et al. (2023). Their study delves into the intricate connection between the informal economy and economic development on a worldwide level, spanning 185 countries across the timeframe of 2005 to 2017. The principal empirical findings, drawn from comprehensive analyses utilizing fully adjusted mean least squares (FMOLS) and Granger causality tests, firmly establish the significant influence of the informal economy on economic development.

Baklouti and Boujelbene (2020) underscore the significance of regional and institutional factors in comprehending the intricate interplay among growth and the informal economy within both developing and developed

nations. In their study, they construct a dynamic simultaneous equation model to investigate the connection among growth and the informal economy across 50 countries, spanning 2005-2015. The findings reveal that the relationship among growth and the informal economy is one-way in Middle East and North Africa (MENA) nations, but it's reciprocal in OECD countries. Specifically, a higher gross domestic product in countries with robust institutional quality corresponds to a smaller informal economy. Nevertheless, the study also highlights that a rise in GDP per capita within countries characterized by lower institutional quality does not impact the magnitude of the informal economy. Baklouti and Boujelbene (2019) conducted a study that analyzes the interplay among growth, inflation, and the informal economy across 45 countries during the time frame of 2005 to 2016. Their findings reveal distinct patterns: Within OECD countries, a two-way connection is identified among growth and the extent of the informal economy, whereas the causal relationship among inflation and economic growth is one-way. Conversely, within the MENA region, a bidirectional relationship is found among inflation and the informal economy, whereas the causality among growth and the informal economy is one-way. The study introduces an additional factor—political stability—which brings about changes in these relationships. Overall, this research seeks to shed light on the economic dynamics within different regions and the influence of political stability. Luong et al. (2020) analyse the relationship among growth and the informal economy by including institutional quality factors in the analysis. In 18 selected transition economies, the relationship between the rule of law, economic growth and the informal economy was analysed. Using annual data for the period 2002-2015, the effect of 18 transition countries on the size of the informal economy was estimated. Generalised Method of Moments (GMM) was used in the study. The results show that economic growth indicators have a negative and significant effect on the informal economy. Moreover, there is an inverse relationship among the rule of law and the informal economy in transition countries. The findings also show that there are positive relationships among inflation, public expenditures and informal economy. The results of this study provide important clues about the effectiveness of the rule of law and growth in controlling the informal economy dimension.

There are also empirical research on the interaction among institutional quality indicators and informal employment. For example, Dreher and Schneider (2010) examine the interaction among the level of corruption, an indicator of institutional quality, and informal economy. The examination of this relationship involves cross-sectional analysis encompassing 120 countries.

Additionally, panel data for the period 1994-2002 is utilized for 70 countries. The findings indicate that the informal economy has contrasting effects on corruption, depending on the income level of the country. In high-income countries, the informal economy appears to diminish corruption, whereas in low-income countries, it tends to amplify corruption. Additionally, the study reveals that more stringent regulations contribute to an rising e in both corruption and the extent of the informal economy. Another study in which the level of corruption is taken as an indicator of institutional quality is Dang et al. (2022). The study analyses 29 Asian countries to examine the impacts of corruption and institutional quality on the informal economy. EKK and difference GMM were used as econometric methods. The findings indicate that corruption exerts a favorable impact on the informal economy, while institutional quality has a negative effect. Another important study is Schneider and Teobaldelli (2012). This resource analyses the effect of direct democratic institutions, an indicator of institutional quality, on the extent and development of the informal economy. By employing econometric analyses on a dataset encompassing 56 democratic samples, the Ordinary Least Squares (OLS) method reveals a noteworthy and statistically significant negative relationship between direct democratic institutions and the informal economy. In his study, Teyyare (2018) analysed the relationship between institutional quality and the informal economy in OECD countries in the period 2003-2013 with the GMM-System panel data model. The findings show that institutional quality is an important factor in preventing the informal economy.

In sum, the effects of informal employment on growth are complex and context dependent. The regulatory role of institutional quality can offset the negative effects of the informal economy on growth and contribute to moving the economy towards more sustainable growth. The literature in this area provides important insights to economic policy makers on what steps should be taken to reduce the informal economy and strengthen the formal economy.

3. Empirical Analysis

3.1. Model, Variables and Methodology

The aim of this study is to examine the effects of informal employment on economic growth in 7 CEE countries, which are the Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia and Slovenia. It also aims to assess the regulatory role of institutional quality factors. For this purpose,

annual data for the period 2007-2021 are used. The model is shown in Equation 1.

$$lnGDP = \beta_0 + \beta_1 lnIE_t + \beta_2 INS_t + \boldsymbol{\beta_3 lnIE_t * INS_t} + \epsilon_t \quad (1)$$

Table 1 provides descriptions for the variables used in Equation 1 and information about the database from which they were obtained. As a contribution to the literature, the variables representing the institutional quality factors are combined into a single index, the Institutional Quality Index (INS), using Principal Component Analysis (PCA). The Institutional Quality Index (INS) is formed based on six governance indicators proposed by (Nawaz et al., 2014; Tran et al., 2021; Uddin et al., 2023). To allow for potential improvements in these indicators over time, the INS is established through principal component analysis. PCA assesses the extent to which a variable's variance is attributed to a specific component. The principal component is computed using the eigenvalues of the sample covariance matrix, which reflect the variances of the variables (in this context, institutional indicators). Usually, the initial principal component elucidates the majority of variance and is therefore used for index computation. A key benefit of PCA lies in the fact that variable weights are determined by the data itself (Nawaz et al., 2014).

Table 1. Definitions of the variables.

Variable	**Abbreviation**	**Description**	**Source**
Gross domestic product	GDP	Per capita (cons. 2015 US$)	WB- W DI (2023)
Informal employment	IE	% of total employment	ILO (2023)
Institutional quality Index	INS		WB-WGI (2023)
· *Control of Corruption*			
· *Government Effectiveness*			
· *Political Stability*			
· *Regulatory Quality*			
· *Rule of Law*			
· *Voice and Accountability*			

Before conducting empirical analyses, it is necessary to test for cross-sectional dependence among variables. Cross-sectional dependence testing is crucial for empirical studies using panel data, especially when countries with similar economic characteristics, like developing nations, emerging economies, and transition countries, are included. Factors such as trade

internationalisation, financial integration, and globalisation can expose an economy to shocks originating in other countries. Therefore, cross-sectional dependence analysis becomes essential in such studies. Conventional panel data methods, however, assume no interdependence among cross-sectional units and uniform coefficients. Neglecting cross- sectional dependence in estimations can lead to incorrect conclusions (Chudik and Pesaran, 2013), and coefficients might vary across units. Thus, assessing the existence of cross-section dependence and slope homogeneity is a starting point in empirical analyses. To achieve this, the Pesaran (2004) CDLM and Pesaran et al. (2008) Bias Adjusted LM tests are initially employed. These approaches are valid when N>T and T>N. Furthermore, the study assesses slope homogeneity using the Δ and Δadj tests developed by Pesaran and Yamagata (2008).

In this study, the Augmented Mean Group (AMG) estimator, introduced by Eberhardt and Bond (2009) and further elaborated upon by Bond and Eberhardt (2013), is utilized to tackle the interdependence across different countries and the unique variations specific to each country. Additionally, this methodology offers the advantage of being able to analyse the parameters of variables that are not stationary. Consequently, there is no necessity for any preliminary testing method (such as unit root or cointegration) before implementing this approach.

To explore the causal relationships among variables, this study employs the heterogeneous panel causality test proposed by Dumitrescu and Hurlin (2012). This approach is an adapted variant of Granger causality designed specifically for heterogeneous panel data. Moreover, Monte Carlo simulations demonstrate that this methodology provides reliable outcomes even when cross-sectional dependency is present.

4. Results and Discussion

In the initial phase of the analysis, an assessment was conducted regarding cross-sectional dependence and country-specific heterogeneity, with the empirical results presented in Table 2. As indicated by the results, the null hypothesis suggesting the absence of cross-sectional dependence across countries is rejected across all tests. This implies that a shock taking place in one of the sampled countries could potentially influence other countries as well. Furthermore, the homogeneity test results indicate the presence of country-specific heterogeneity among the countries.

Table 2. Cross-sectional dependence and slope homogeneity.

	Statistic	p-Values
Cross-sectional dependence		
LM	93.774***	0.001
CDLM	24.455***	0.000
CD	-1.198**	0.020
LMadj	15.332***	0.003
Homogeneity		
$\hat{\Delta}$	31.221***	0.000
$\hat{\Delta}_{adj}$	46.980***	0.000

Note: *** and ** Indicate significance at 1% and 5% level, respectively.

In the second step of the analysis, the effects of informal employment, institutional quality and the interaction of institutional quality with informal employment on GDP were examined using the AMG estimator. The outcomes are outlined in Table 3.

Table 3. AMG Estimation result

	lnIE	lnINS	lnIE*INS
Czechia	-0.0506* [0.078]	0.0002** [0.014]	0.0015* [0.065]
Estonia	0.0291* [0.082]	0.0150** [0.031]	0.0017** [0.013]
Hungary	-0.0096*** [0.007]	0.0132* [0.051]	-0.0017*** [0.001]
Latvia	-0.0134* [0.080]	0.0075 [0.201]	0.0033 [0.198]
Poland	0.0213 [0.322]	0.0018* [0.090]	-0.0018 [0.322]
Slovak Republic	-0.0054* [0.062]	0.0018* [0.066]	0.0019** [0.012]
Slovenia	-0.0093* [0.067]	0.0015* [0.080]	0.0028* [0.087]
PANEL	-0.0054** [0.013]	0.0012* [0.081]	0.0015** [0.036]

Note: *, ** and *** indicates statistical significance at 10, 5 and 1% level, respectively. Numbers in brackets are standard errors.

According to the results presented in Table 3, the coefficient of the Institutional Quality Index (INS) is found to be positive and significant in all countries except Latvia. This result shows that the institutional quality index positively affects economic growth. In other words, it can be considered that better regulations, transparency, rule of law and governance practices

can promote economic growth in these countries (Acemoğlu and Robinson, 2008; Nawaz et al., 2014). Looking at the results of informal employment on growth, it is seen that the coefficient of informal employment is negative and significant in Czechia, Hungary, Latvia, Slovak Republic and Slovenia. Negative and significant coefficients indicate that an increase in informal employment reduces economic growth and that this type of employment can often lead to low productivity and waste of resources. These results indicate that policy measures aimed at reducing informal employment may have the potential to increase economic growth in these countries (Çelik et al., 2021; Baklouti and Boujelbene, 2019). It is concluded that the coefficient of informal employment is positive and significant for Estonia. It shows that informal employment can positively affect economic growth in this country. For this result, it can be considered that informal employment can help increase employment and productivity by providing flexibility, especially in some economic situations or sectors (Schneider, 1994; Goel et al., 2019). The countries where the coefficient of the variable showing the interaction of informal employment and institutional quality index (lnIE*INS) is positive and significant are Czechia, Estonia , Hungary, Slovak Republic and Slovenia. These results indicate that when informal employment and the institutional quality index are considered together, a positive effect may emerge. That is, it can be argued that when lower rates of informal employment and high quality institutional framework come together in these countries, economic growth may gain a more positive momentum. This result is consistent with Loung et al. (2020), Baklouti and Boujelbene (2020) and Teyyare (2018). Looking at the results representing the panel in general, it is seen that the coefficient of informal employment is negative and significant, the coefficient of the institutional quality index is positive and significant, and the coefficient of the variable showing the interaction of informal employment and the institutional quality index is positive and significant. This indicates that informal employment may negatively affect economic growth, while the institutional quality index may positively affect economic growth. In addition, the interaction of informal employment and institutional quality index can positively support growth. These results may emphasise for economic policy makers the potential of reducing informal employment, promoting institutional reforms and adopting good governance practices to increase economic growth.

In the third phase of the analysis, the investigation delves into the causal connection between economic growth, informal employment, and institutional quality through the application of the heterogeneous panel causality method. The outcomes of this examination are presented in Table 4.

Table 4. Heterogeneous panel causality test results.

Null Hypothesis	W-Stat.	Zbar-	Null Hypothesis
lnGDP ⇏ lnIE***	4.9035	7.3029	0.000
lnIE ⇏ lnGDP*	4.5506	1.6748	0.094
lnGDP ⇏INS	2.8943	1.1830	0.236
INS ⇏ lnGDP***	10.2907	7.8748	0.000
lnIE ⇏ INS	4.9652	2.1226	0.134
INS ⇏ lnIE***	8.8188	6.2850	0.000
Note: *, ** and *** indicates statistical significance at 10, 5 and 1% level, respectively.			

The results in Table 4 show that there is a bidirectional causality relationship between economic growth and informal employment. This shows that economic growth and informal employment affect each other. This result is an important finding showing that the relationship between economic growth and informal employment is reciprocal and interactive and is consistent with the studies of Bölükbaş (2018) and Baklouti and Boujelbene (2019). The causality results between economic growth and institutional quality are consistent with the literature. The results demonstrate a causal relationship that operates in one direction between institutional quality and growth (Chong and Calderon, 2000; Kebede and Takyi, 2017). In other words, it is possible to conclude that as the level of institutional quality increases, economic growth also increases. The last conclusion that can be drawn from Table 4 is related to informal employment and institutional quality. In terms of institutional quality and informal employment, there exists a unidirectional relationship. In other words, it shows that institutional quality is an important factor affecting informal employment. In other words, it is possible to conclude that informal employment is lower in places with better institutional quality. This finding is also in alignment with the outcomes of Dreher and Schneider (2010), Schneider and Teobaldelli (2012), and Dang et al., (2022).

5. Conclusions and Policy Implications

This research examines the impact of informal employment on economic growth in a selection of CEE countries. A key objective of the study is to evaluate the regulatory influence of institutional quality factors in this context. The investigation employs yearly data spanning from 2007 to 2021, and employs two analytical methods: the augmented mean group (AMG)

estimator and the heterogeneous panel causality method, both of which are appropriate for addressing diverse panels. These methods allow for an exploration of the relationship between variables while considering cross-sectional interdependence and country-specific variations. Consequently, the study initiates by assessing the dependence and homogeneity across countries.

The AMG findings suggest that informal employment can negatively affect economic growth, i.e. increased informal employment generally leads to lower productivity and wastage of resources. This is supported by the results that the coefficient of informal employment is negative and significant in countries such as Czechia, Hungary, Latvia, Slovak Republic and Slovenia. However, in some countries, it has been observed that informal employment may have a positive impact on economic growth. For example, in Estonia, it is concluded that informal employment has a positive effect on economic growth. This provides a perspective that in some sectors or economic situations, informal employment may help to increase employment and productivity by providing flexibility. Moreover, the institutional quality index (INS) is found to positively affect economic growth. This result suggests that better regulations, transparency, rule of law and governance practices can promote economic growth. The coefficient of the variable showing the interaction between informal employment and institutional quality index (lnIE*INS) is positive and significant, indicating that these two factors can create a positive synergy when considered together. The outcomes of the causality test reveal a mutual connection between economic growth and informal employment. This relationship shows that both economic growth affects informal employment and informal employment affects economic growth. The relationship between economic growth and institutional quality suggests that better institutional quality is associated with higher economic growth. Finally, the causality test results show that better institutional quality has a negative impact on informal employment. This suggests that institutional quality can play an important role in reducing informal employment.

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