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Relationship of the informal economy with unemployment and GDP per capita: A case of OECD and non-OECD economies

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ABSTRACT

The current study explored the relationship of the informal economy with unemployment and GDP per capita for the year 2019.The OECD and non-OECD countriesused in the study to explore this relationship, and the total number of countries is 80. The application OLS method found an increase in GDP per capita will reduce the size of the informal economy but the unemployment rate found a positive association with the informal economy. Current research also concludes the size of the informal sector should reduce to promote economic activities in the formal sector.

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INTRODUCTION

The informal economy is a broad concept with several names used in economics literature such as shadow economy, informal economy, hidden or black economy (Medina and Schneider, 2019). The concept of the informal economy became more important Guttmann investigated that the US economy consisted of $199 billion of the informal economy. the study further found informal economy has a contribution to economic activities and the development process. The formally informal economy includes all financial activities that are not reported or counted in national income accounting (Hart, 1985). The ICLS[1] suggested all activities of individuals, companies or small business includes in a shadow economy that avoids taxes and makes some revenue. so, the Informal economy includes the activities of illegal trade,

smuggling, unregistered jobs, home-based work, gambling, trade under the barter system, use of the bill of exchange, and child labor. these all activities generate revenue but have no place in national income accounting such as measurement of GDP.

The informal economy's sustenance refers to a misunderstanding in market competition caused by the unequal range of products between suppliers in the formal sector and manufacturers' operations in the shadow economy. It causes challenges for the formal economy and makes capturing social indicators in the economy challenging. Furthermore, the informal sector complicates the collection of taxes, and several studies have shown a substantial association between the unofficial economy and tax income (Sevgin, 2009). Tax income has decreased as a result of the informal economy, and this shortfall influences economic activity such as inadequate budget allocation for infrastructure works. As a result, most governments raise their tax rates, and those who own property must bear the tax liability (Schneider, 2002). These higher taxes exacerbated tax avoidance and exacerbated the unofficial economy's condition.

As per the present research, the informal sector covers all financial transactions that are concealed from government regulators for money purposes. In terms of monetary capacity, enlighten economic operations that include tax avoidance or other welfare payments. Furthermore, from a regulatory standpoint, it encompasses the evasion of operational authority or legislative responsibility. (Medina and Schneider, 2019).

the recommendation of fiscal and monetary guidelines based on the official statistics and informal sector reduces the accuracy of data provided by the concerned departments. therefore, the presence of the informal sector reduces the effectiveness of fiscal and monetary policies (Medina and Schneider, 2019). Under these situations, the measurement of the informal economy became more important and it will make possible the more accuracy of statistics.

Many researchers have advocated that governments pay greater attention to the phenomena of the shadow sector rather than attempting to reduce the extent of the shadow economy (Chen, 2012). Reducing the scale of the informal economy is not even an easy task; it takes many years as well as some challenges such as legal, administrative, and economic procedures. In any event, the government official may alleviate a few of the negative impacts of the shadow economy, particularly those related to statistics.

There are various approaches for measuring the extent of the shadow economy, but it is a challenging task. People are not willing to provide information about their informal or underground economic activities creating hinders to calculating the volume of the informal economy. However, policymakers are continually attempting to obtain this knowledge to assess

[1]International Conference of Labor Statisticians works for labor and provide polices for its betterment.

the underground economy since they want data to make policy decisions. As a result, an accurate evaluation of economic growth and development is dependent on the monitoring of the informal economy (Medina et al., 2019). Tax income is the lifeblood of an economy, and the size of the informal sector predicts tax evasion, which may be controlled by proper measurement of the shadow economy.

Direct techniques, such as interviews, surveys, volunteered responses, and tax audits, may be used to assess the informal sector. This strategy is dependent on the kind of questionnaire and affects the assessment. Many additional indirect ways are thought to be effective, such as the gap between the actual and formal labor force and the decrease in the labor force deemed to be active in the shadow economy. To assess the underground economy, many scientific studies used multiple indicator-multiple cause models (Medina and Schneider, 2019). The MIMIC model uses a variety of methodologies to estimate the size of the informal sector. Because individuals in the informal sector conduct economic transactions via cash, this technique employs currency as a component of wide money. As a result, the exact dimensions of informal can be measured. Cagan (1958) utilized a basic monetary method approach, while Tanzi (1983) used a similar technique with minor adjustments to estimate the size of the informal economy. The present study's goal is not to measure the informal sector; hence it relies on data from an IMF working paper.

Hence, the current study explores the relationship of shadow or informal economy with GDP per capita and unemployment. To find this behavior of the informal economy, a total of 80 OECD and non-OECD member economies were employed in the study. The methods used to calculate the informal economy are not the purpose of the study so, it is not discussed here and employed the data of the informal sector from the IMF working paper(Medina and Schneider, 2020) and other pieces of literature(Medina and Schneider, 2018).

LITERATURE REVIEW

Unemployment and informal economy are considered a direct association and Mauleon&Sarda et al. (2018) found this relationship in their study. The study used a monetary approach to capture the volume of the informal sector and used data over the time 1980-2012. The study found informal sectors havea positive relation with unemployment where the unemployment rate is high. There is no nexus found between these two indicators for the economies where the rate of unemployment is low. Stengos and Asiedu (2014) studied the informal sector of Ghana over the period 1983 to 2002 and the currency demand approach used to calculate the size of the informal sector. The study concluded to regulate the size of shadow economy is essential for the accurate results of monetary and fiscal policies. Goel et al. (2019) investigated the informal sector of the US from 1870 to 2014. The regression tool of OLS employed that foud informal sector has a negative impact on the economic growth of the US. However, the study further found afterworld war second, the informal sector contributed positively to economic growth. Dobre and Alexandru (2010) tried to explore the causality between the informal economy and unemployment. The study explored the existence of causality between these two variables in short and longrun.period.

Dynamic Ordinary Least Squares method of estimation was employed to explore the size of the informal sector of Japan by Kanao and Hamori (2010). If found the size of the informal economy reduced with time and it suggested the accurate measurement of shadow economy can

reduce the smuggling and other unofficial works.In their study,Sevgin (2009) found economic indicators such as the increase in tax rate and high inequality havea positive association with the informal economy. In his study, Schneider (2009) studied the informal economy of OECD economies and found informal sector is not a serious issue for developed countries because the income earned from this sector spend the informal sector. Moreover, the informal sector improved the standard of living of the OECD countries. Anno et al. (2007) studied the informal sector of Mediterranean countries and explored unemployment increased the activities in shadow seconomy. The informal sector also affected economic growth by creating a negative association between informal sector progress and economic growth.

In their study (Alanon and Antonio, 2005) estimated there are several factors that causeedthe informal economy such as taxes, labor force cast and government regulations are among most important determinants. This study was limited over the period 1976 to 2002 and time-series data estimation techniques. Schneide and Enste, 2000 conducted a study on OECD economics and found tax rates and labor force are the most important factors that promote informal economic activities. So, minimum wage rate policy and proper check and balance on the labor market can reduce the volume of the informal economy. Moreover, many other studies such as [Saffi et al. (2015), Dell & Solomon (2008), (Giles and Tedds, 2002), Davidescu, Dobre (2015), Kumar (1999) and, Dobre and Alexandru (2009),] studied the informal economy and suggested, informal economic activities should be reduced to promote the formal economic activities.

Model Specification

There are several factors found that createan impact on the volume of the informal sector and it helps to construct an appropriate economic model. So, we take several factors that are participation of labor force, rate of tax, OECD, rate of unemployment, GDP per capita, and inflation rate. Economic literature supports these indicators such as these havethe potential to fluctuate the size of the informal sector. So, the model that will use in the estimation process is,

Informal Economy = f (labor force participation rate, GDP per capita, unemployment, inflation rate, tax, and OECD)

Therefore the functional form of the model is,

$$IEi = \beta o + \beta 1\ LFPi + \beta 2\ GDPCi + \beta 3\ UEi + \beta 4 INFi + \beta 5\ TAXi + \beta 6\ OECDi + \mu i \quad (1)$$

Here, IE indicates the informal economy;LFP is the abbreviation of labor force participation, GDPC, UE, INF, TAX shows the unemployment, inflation rate, tax respectively. OECD shows the OECD countries and dummy variable used to represents the OECDvariable. The OECD country assigned zero value and non-OECD assisgned value one.The sample consisted of eighty countries that included 43 non-OECD and 37 OECD nations. The data is collected for the year 2019 so,we can say present stuy is based on cross sectional data.

Data of independent variables gathered from WDI and the informal sector were used (Medina and Schneider, 2020) to collect data.

RESULTS AND DISCUSSION

The data analysis and estimation portion of the study used sevrel econometrics techniques to get the accurate resutsls. This procedure pollowed the correlation analysis, Orginary least square (OLS) and Breusch-Pagan test for heteroskedasticity.

Correlation analysis

Table 1: *Correlation analysis*

	UE	GDPPC	IE	INF	LFP	TAX	OECD
UE	1						
GDPPC	-.14	1					
IE	.06	-.69	1				
INF	-.07	-.39	.42	1			
LFP	-.38	.33	-.04	.002	1		
TAX	-.25	.29	-.22	-.62	.41	1	
OECD	.03	-.69	.65	.43	-.13	-.16	1

Source: Author's formation based on STATA 13.0

The correlation matrix indicates variables are handsomely correlated and there is no very storing or weak association among all indicators. So, we can depend on this data set for advanced analysis as there is no perfect correlation among variables.

Table 2: *Model Estimation*

Informal Economy (Dependent Variable)				
Variable	Coefficient	Std. Err	t value	prob
UE	.11	.20	0.55	.50
GDPPC	-.0003	.00006	-4.78	.001***
INF	.32	.28	1.14	.27
LFP	.25	.09	2.77	.009***
Tax	-.12	.08	-1.5	.19
OECD	5.74	2.70	2.12	.037**
cons	19.09	4.90	3.89	.000***
observations	80			
Prob> F	.000			
R-squared	.89			
Adj R-squared	.87			

Source: Author's formation by using STATA 13.0

The coefficient value of the unemployment rate is positive indicates there is a positive association between the rate of unemployment and informal economy but this result is insignificant as a higher prob value. GDP per capita has negative relationship with informal economy so, we can suggest an increase in GDP per capita of the formal sector will reduce the size of the informal or unofficial sector. This result is highly significant as a very low value makes it a significant event at a 2 percent significant level. The rate of inflation rate found a

positive association with the informal sector so,an increase in the inflation rate informal sector will increase the size of the informal sector. The indictor labor force participation found a positive and significant impact on the size of the informal economy. Taxes found a negative impact on the size of the informal economy and the final variable is OECD also found a positive association with the informal economy which indicates the OECD economies have more chances of the high value of shadow or unofficial economy. The value of R-squared is 0.89 which indicates the model is a good fit and we can rely on the findings of estimation of the model.

Table 3: *Test to examine the heteroskedasticity*

Breusch-Pagan test	
F Stat	0.72
Prob> Chi2	0.59

Source: Author's formation by using STATA 13.0

The estimated value of chi-square is 0.59which is less than the minimum criteria of 5perent of 10 percent of significant level. So, in our case,null hypothesisis accepted and we can say there is no issue of heteroskedasticity present in the data set such as the existence of constant variance among residuals.

CONCLUSION

The effects of GDP per capita and unemployment on the informal sector are investigated in this research. The study used 80 countries that included both OECD and non-OECD nations, but all OECD economies were included in the analysis. The study used labor force participation rate, GDP per capita, unemployment, inflation rate, tax, and OECD as independent variables, and all data is collected for the year 2019. In the data analysis and estimation portion of the study, correlation analysis, Ordinary Least Squares (OLS),andBreusch-Pagan test for heteroskedasticitywereemployed. The study found unemployment rate, labor force participation rate, OECD, andrate of inflation rate positively contributed the informal sector. The other variables are GDP per capita mad taxes have a negative impact on the size of the informal sector. Therefore, we can suggest officials should increase the GDP percapita and reduce the unemployment rate to decrease the size of the informal economy.

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