RICHTMANN
PUBLISHING

Research Article

Financial Development and Its Impact on the Shadow Economy in Albania

Ada Aliaj

Rovena Vangjel

Finance Accounting Department,
Business Faculty,
University "Aleksandër Moisiu",
New University Campus,
Miqësia Str., Spitallë,
Durrës, Albania

Abstract

This study investigates financial development's effect on Albania's shadow economy from 1995 to 2015. We use data on the shadow economy from Medina and Schneider (2018) and other economic variables to examine the relationship between the shadow economy and economic growth. We use ADF, PP, and KPSS tests to determine the stationarity of the data series and Toda Yamamoto Granger Causality and VAR(p+dmax) estimation to identify the direction of the causal relationship between financial development and other economic variables and the shadow economy in Albania. Our results indicate a unidirectional causal relationship between financial development and the shadow economy, as well as between trade openness and the shadow economy. These findings suggest that efforts to improve and deepen financial development and trade openness could help formalize Albania's economy. Based on these results, we recommend that the Albanian government focus on financial inclusion reforms and facilitating exports and imports to combat the shadow economy and bring these activities into the formal sector.

Keywords: Shadows Economy, Financial Development, Toda Yamamoto Granger Causality Test

1. Introduction

The formal sector is a significant factor that helps the government to mobilize revenue and helps engage in effective reforming policies. In contrast, the informal sector impedes revenue declaration, mobilizing them and contributing to developing policies. The shadow economy is activities that are unrelated to gross domestic product (GDP) (Schneider & Enste, 2000).

Blackburn et al., 2012 stated that the informal sector negatively affects fiscal policies while public goods affect the livelihood of the most vulnerable part of society, "the poor" (Kim, 2005). Also, informality increases corruption (Dreher & Schneider, 2010), raises public debts (Elgin & Uras, 2013), decreases the quality of the environment (Biswas, Farzanegan, & Thum, 2012), shocks the level of tourism (Badariah, Habibullah, & Baharom, 2015), inequalities getting higher (Rosser, Rosser, & Ahmed, 2000), and establishes insecurity in big cities (Schneider, 2008). Considering the significant impact of informality on political, economic, and social life, it is necessary to find other factors that

cause the informal sector to decrease its proliferation and improve public policies. Among other characteristics of social, unemployment, inflation, tax burden, psychological economic, the law, political stability, cultural, and administrative is financial development (financial inclusion), a possible cause of the informality. Some studies consider that the shadow economy is caused by financial development (Canh & Thanh, 2020); Khan et al., 2021; Gobbi & Zizza, 2007 Ajide, 202; Capasso & Jappelli, 2013; Njangang et al., 2020; Bayar & Özturk, 2016; Berdiev & Saunoris, 2016; Bose et al., 2012; Gharleghi & Jahanshahi, 2020).

Other previous literature focused on the relationship between the development of the financial system and economic growth (Vangjel & Mamo, 2022; Aslan & Korap, 2006; Levine, 1997), and fewer studies is focused on the relationship between financial development on the shadow economy, especially in developing countries, as Albania country.

This study emphasizes if financial development empirically affects the shadow economy. While the informal economy generally operates with cash, financial development decreases the use of money with many other methods instead. This way will facilitate monitoring of how the cash move. This means that financial inclusion has a shrinking effect on informality. The follow-up of economic activities is more accessible with financial inclusion.

The financial system's primary function is to help transfer funds from sufficient units (savers/lenders) to deficit units (borrowers/companies and individuals). Financial development means financial inclusion, money moving through financial institutions, better ways of mobilizing savings, etc. Financial development facilitates resource allocation and the exchange of goods and services and provides insurance in all the processes, monitoring managers and maintaining corporate control (Levine, 1997). With the financial sector, the two parties can meet and exchange funds and evaluate their money. There will be no investments or savings. So, the sustainability of the macroeconomic balance in the economy can be achieved by the existence of a financial system and its development (Erdem, 2010). Thanks to economic development, businesses can receive loans, invest, take incentives, take advantage of the circumstances, and work in a formal economy. Others who do not work in the formal sector choose to work underground and move money in a hidden way (Straub, 2005). These factors can lead to increased economic growth and activity in the formal economy (i.e., the economy as it is formally recognized and regulated by the government). At the same time reducing the size and activity of the informal economy (i.e., economic activity that takes place outside of the formal economy and is not regulated by the government).

As financial development occurs, financial actors (i.e., individuals or organizations involved in financial activities such as banking, investing, and lending) will be motivated to operate within the formal sector to take advantage of the opportunities and benefits of financial development. Financial development can refer to expanding financial services and institutions, increased access to financial resources, or an improved regulatory environment for financial activities. Financial actors can access a broader range of financial products and services by operating within the formal sector. They may also be subject to greater oversight and regulation, which can help to promote stability and trust in the financial system.

Multiple studies have found a negative correlation between the size of the informal or shadow economy and the level of financial development. These studies often use panel data analysis to reach this conclusion. (Gharleghi, & Jahanshahi, 2020; Bayar & Özturk, 2016; Berdiev & Saunoris, 2016; Bose, Capasso & Wurm, 2012; Canh & Thanh, 2020; Capasso, & Jappelli, 2013; Ajide, 2021; Gobbi, & Zizza, 2007; Khan, Abdul, et al., 2021; Njangang et al., 2020).

This study presents if there is a connection between financial development and the shadow economy, focusing only on Albania from 1995 to 2015. The study uses indices involving financial development, shadow economy (measured by Medina & Scheider, 2015), inflation, economic growth, and trade openness as control variables of economic growth. The study covers 1995-2015 and uses the Augmented Dickey-Fuller (ADF) unit root, Toda-Yamamoto Granger Causality (TY), with a new form of Vector Autoregressive Regression (VAR) (Kapicioğlu, 2022).

Most of the studies are based on panel data, but our paper is based on empirical estimation of

time series; we intend to reduce the gap in the literature for studies with one country. We provide an empirical study to identify the connection between Albania's shadow economy and financial development. Also, this study differs from other studies due to its methods and the data it considers for financial growth.

We choose Albania because it represents developing countries working on financial inclusion and development, fighting tax collection, and decreasing the informality in many sectors. The main reason is that no other study implicates financial development and the informal economy. Considering that the development of the financial system is one of the main issues for countries like Albania, these proxies helped identify a relationship between the development of the financial system and the shadow economy through some other economic variable.

This paper consists of the literature – In section 2 and the methodology and data - in section 3. Results are presented in Section 4, concluding with Section 5 with limitations and further studies.

2. Literature

Different authors use different concepts to determine informal activity. Still, they all have the same content known as "the black, underground and illegal market," "shadow economy" (Becker, 2004), or "Hidden incomes or Hidden Economy" or informal economy (Khuong et al., 2021).

Informality lowers tax revenues and reduces the government's possibility to invest or spend on social programs. This means the citizens will lack public services, infrastructure, and social programs.

King & Levine (1993) are recognized for several theoretical and empirical studies that have estimated the relationship between financial development on economic development. However, more attention should be paid to literature that studies the relationship between financial development and the informal economy. Different authors, such as Straub (2005), Blackburn et al. (2012), and Capasso & Jappelli (2013), have provided theoretical conclusions about the fact that there is any connection between the informal sector and financial development.

Some of the studies are based on macro-level data. Becker (1968) on his work tries to compare the benefits of the shadow economy (e.g., avoiding taxes) and the costs resulting from the formal economy, analyzing the relationship between financial development and the shadow sector and financial development. Bose et al. (2012), in their study of 137 countries from 1995 to 2009, investigated if there was a connection between banking development and the shadow economy. They used a panel analysis of cross-sectional and found that both the efficiency and the depth of the banking sector reduced the size of the shadow economy. In the case of Turkey, Bayar & Aytemiz (2017) identified a unidirectional relationship between financial development to the informal economy. In the long run, the informal economy is reduced by financial development. Gobbi & Zizza (2012) investigated the impact of financial development and the shadow economy in the Italian credit market and identified that the relationship was insignificant. Massenot & Straub (2011), in their study, recognized that an open economy decreases informality and increases the formal sector, considering that formality facilitates firms to put their assets as collateral in an efficient way, leading to more ways of investment and higher sales and productivity.

Also, there are literature reviews at the micro-data level. Raj & Seethamma (2007) used 6797 businesses from a city, finding that informal manufacturing companies can produce only less than 50 percent of their output. That city needs more technological efficiency. In the same kind of study, Benjamin & Mbaye (2010), by using data from 900 firms in Benin, Senegal, and Burkina Faso, investigate the differences in productivity among informal and formal firms.

In a study of firm-level data for the Indian manufacturing sector, Beck & Hoseini (2014) identified no significant relationship between financial development and firms working on informality. Also, they investigate that trying to enter the formal economy by outreach to the banks helps reduce the incidence of informality. Similarly, Straub (2005) illustrates the negative effect of the informal sector on the formal sector through the channels of how the credit market affects. In a study of 49 developing countries, Gatti & Honorati (2008) utilized another variable, tax compliance, to

measure the formal economy. It found that tax compliance positively correlates with credit access, identifying growth. Their study analyzed that increasing economic growth would decrease the value of a tax-evading. A negative relationship was found between the level of financial development and tax evasion practices. Capasso & Jappelli (2013) used microdata for Italy and investigated if there was a relationship between the size of financial development and the shadow economy; they found that financial development can reduce tax evasion and the shadow economy. Furthermore, Caro et al. (2012), in their study of Colombia, found a negative correlation between the informal working force and employment, performance of the business, and access to credits.

Also, excessive regulation could be a reason for reducing the formal economy and for a more significant informal sector affecting economic growth (Loyza et al., 2004; Sarte, 2000;). An increase in the informal economy could limit several public goods financed by the government, thereby reducing potential economic growth Schneider (2006). The shadow economy, which is not subject to taxation, decreases tax income and requires governments to find alternative ways to fund their expenses. Therefore, governments may be more inclined to use inflation to generate revenue when the shadow economy is significant to meet their financial needs and fulfill their public finance objectives (Mazhar & Meon, 2012).

We choose Albania as one of the critical countries of the most debated regions of Western Balkan (WB)[1]. Its economy is categorized as a developing economy, and Albania was granted EU candidate status in June 2014. According to Schneider (2015), Albania is classified with an informal economy of 26.21% of GDP and is estimated to reach up to 50 percent of GDP[2]. Some of the studies for developing economies estimated the size of the shadow economy to a percentage of over 40 percent (Gërxhani, 2004; Schneider, 2006; Schneider & Enste, 2000; La Porta & Shleifer, 2008).

Governmental systems and regulations have problems and need to be more effective in implementing the law, creating possibilities for a growing informal economy. Considering Muceku and Balliu's (2017) study about the Albanian taxpayer perception and how the tax system impacts economic growth, most respondents think that Progressive taxation is unfair, increasing their tendency not to declare their incomes.

On the other side, Bode (2009) concludes that the main factors as widespread corruption, legal problems, arbitrary framework and high bureaucracies in the public administration, and lack of information brought the development of the shadow economy in Albania. Gerxhani (2006), in his paper, talked about some suggestions for decreasing the possibility of having a shadow economy; a) Increasing the registration of private enterprise through a decrease of entry barriers; b) Change gets in the structure of bureaucracies; c) Re-enforcing legal institutions by international assistance; e) Protecting and strengthening property rights by the government. Veliu (2008) emphasizes that there is no specific solution for transforming the shadow economy into a formal economy. Other possibilities for reducing the informal economy have been limited to those above. With this paper, we tried to find other factors like financial development that may affect and reduce the informal economy. Previous studies (Liu & Hsu, 2006; Dawson, 2003; Lensink, 2001; Khan & Senhadji, 2000; King & Levine, 1993; Demetriades & Hussein, 1996; Levine & Zervos, 1998; Rajan & Zingales, 1998) were focused the relationship between financial development and economic growth and not the informal economy (Vangjel & Mamo, 2022; Vangjel & Babu, 2022).

The Hypotheses for this paper are:

(H1) Financial development Granger causes shadow economy (and vice versa).

(H2) Economic growth, inflation, and trade openness Granger cause shadow economy (and vice versa).

---

[1] *Western Balkan – Albania, Kosovo, North Macedonia, Montenegro, Serbia, Bosnia Herzegovina (6 countries)*
[2] *"The long Shadow of Informality", Challenges and Policies, book from World Bank Group, 2021. https://thedocs.worldbank.org/en/doc/37511318c092e6fd4ca3c60f0af0bea3-0350012021/related/Informal-economy-full-report.pdf*

(H3) Financial development proxies have a negative impact on the shadow economy.

(H4) Trade Openness has a negative impact on the shadow economy.

(H5) Inflation has a positive effect on the shadow economy.

(H6) Economic growth has a negative impact on the shadow economy.

Our paper examines the connection between financial development and the informal economy in Albania using macroeconomic data. Our article is the first to examine the empirical relationship between financial development and the informal economy in Albania using annual data from a single country. The findings of our study also have practical significance for policymakers looking to reduce informality and achieve optimal growth through economic and financial policies.

3.   Methodology and Theoretical Framework

The methodology presents the econometric model, which includes secondary data. The econometric model is a time series estimation for 1996-2019 (annual data series), which tends to analyze the relationship between financial development and the shadow economy, including the variable that estimates economic growth as GDP growth, inflation, and trade openness.

3.1   Data

Shadow Economy (SE) is the dependent variable, referring to the quantitative estimation of this variable from Medina &Schneider (2018). SE is a time series available until 2015; therefore, all the data are from 1995 to 2015 (21 observations). The approach estimates SE as a percentage of GDP used in this study called Multiple Indicators Multiple Causes (MIMIC). Authors as Njangang et al. (2020), Ajide & Dada (2022), Kapicioÿlu (2022), Canh & Thanh (2020), Gharleghi & Jahanshahi (2020, Khan et al. (2021), Ajide (2021) have used this variable as dependent one. The average estimate of SE for Albania is 31.25%, with a minimum of 25,41% and a maximum of 39,18% (referring to Table 1).

Two variables are used to measure financial development (FD); they will be considered independent variables. FD will be estimated by the proxies a) by broad money as a percentage of GDP (M2/GDP) and b) domestic credit to the private sector by banks as a percentage of GDP (PrivCrd) (Gharleghi & Jahanshahi, 2020; Njangang et al., 2018; 2020; Berdiev & Saunoris, 2016; Bayar & Ozturk, 2016; Bose et al., 2012). These variables are chosen because they are the most reliable proxies for the efficiency, diversity, and availability of the financial system for developing countries (Vangjel & Babu, 2022), (Vangjel & Mamo, 2021), and especially for countries that are bank-based systems (Henri et al., 2019). These data sources are from the World Bank Indicator (WBI) database.

About control variables, we include some control variables for any possible biased missing variables. They represent (a) GDP growth (annual%), (b) Trade openness (c) Inflation. It has been estimated that the level of export and imports and the stability of prices may impact how the shadow economy operates (Ajide 2021 &Dada et al. 2002). Suppose the price instability (inflation proxy) tends to increase. In that case, this will cause the activities in the informal economy may increase if the inflation is at a higher rate and not stable. While a high level of trade openness of exports and imports may reduce implications in the shadow economy (Ajide, 2021; Massil & Noah, 2019; Veiga & Rohman, 2017)

Table 1 explains the variables and the possible expectations of the connections between the shadow economy (Y_t) and explanatory variables (X_t). Most expectations about SE and FD variables are negatively related; the same is expected between GDP growth and Trade Openness. A positive relationship is expected between SE and inflation. Table 2 gathers descriptive information about the variables included in the model. Trade openness increased last year, reaching a maximum value of 83.2% and a volatility of 11.74% in years. Inflation reached higher values during the financial collapse of 1997, impacting a high average of inflation of 5.5%, while the minimum reached was 0.05%.

Table 1: Summary of variable

	Definition	Possible Expectation
SE	Shadow Economy (%GDP)	NA
GDPG	GDP growth (annual%)	Negative
M2/GDP	Broad money (% of GDP)	Negative
PrivCrd	Domestic credit to private sector by banks (% of GDP)	Negative
TO	Trade openness (export + import (% *of GDP)* (% of GDP)	Negative
Inf	Inflation, consumer prices (annual %)	Positive

Table 2: Descriptive data estimation

	Mean	Max	Min	Std.Dev.
SE	31,125	39.18	25.41	5.01
GDPG	4.58	12,89	-10,92	4.73
M2/GDP	70.65	85.65	46.22	11.11
PrivCrd	20.797	39.31	3.25	15.28
TO	68.01	83.20	44.89	11.74
Inflation	5.50	33.18	0.05	8.09

Source: Author's calculation

3.2 Methodology

Estimating the relationship between financial development and the shadow economy for the Albanian Case, we use the endogenous growth model, using Eview. For the empirical estimation, we run these steps: Unit root test for the variables, Lag length determination, and Toda Yamamoto Granger Causality.

Econometric estimation of time series requires the series to be stationary because non-stationarity series usually confuse the results. Engle and Granger (1987) provided a technique for testing stationarity variables. Augmented Dickey Fuller (1979) (ADF) test, Philip Perron (1988), Kwiatkowski–Phillips–Schmidt–Shin (KPSS) helps run the regressions for all the series at levels I(0), the first difference I(1) or second difference I(2), considering the constant and trends in the equation.

The second step is determining lag length, which can be run using Akaike information criterion (AIC) and Shwarz Information Criteria (SC).

To identify the direction of causality, run the Toda Yamamoto Granger causality (TY) (1995). TY approach extends the estimation of the Vector Autoregressive Regression (VAR) model with the highest level of integration (d) of the series and with the optimal lag length (p). The Toda-Yamamoto approach will be estimated from a new unconstrained VAR (p + d) model.

The new equation of VAR (p+d) is:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \cdots + \alpha_p y_{t-p} + \alpha_{p+d} y_{t-(p+d)} + \beta_p X_{t-1} + \cdots \beta_l X_{t-p} + \beta_{p+d} X_{t-(p+d)} + \varepsilon_t$$

y_t-SE is the dependent variable and shows the shadow economy of Albania at time t

α is the coefficient for the constant term

β_t is the coefficient for of explanatory variable GDP growth

X_t are the variable Broad Money, Private Credit, GDP growth, Inflation, Trade openness

ε_t is the coefficient error term,

t indicates the year (1995-2015)

In the TY approach, nothing is applied to the first l factor for the causality analysis. The hypothesis of TY causality:

Ho: $\beta_1 = \beta_2 \ldots = \beta_p = 0$ (no causality between variables)

Ho: $\beta_i \neq 0$ (for at least one (there is causality between variables)

Despite many estimations for time series, it is essential identifying the direction of causation among variables. The causality technique tests the causality between variables, not the real relationship between them Granger (1969). Running the Granger causality test with the Toda-Yamamoto approach is more reliable because it can be considered to run regardless of if proxies are integrated in a different order I(0), I(1), or I(2), stationary around the trend or no stationary at all. In our case, our variables are mixed, making it challenging to run only the Granger Causality test. The TY approach adopted a new way of Wald test where the parameters are restricted by the VAR (p), where the lag length is p. The system with (p) determined needs the highest order of integration (dmax) to be estimated as The VAR (p + dmax). The TY approach adopts that the Wald statistic allocates the function of chi-square with freedom degrees. The number of eliminated lagged variables corresponds to degrees of freedom.

4. Results

Referring to the tables below, we have some results for the time series estimation. First, Table 3 shows that the model has no autocorrelation in the residuals, according to the Durbin Watson, Q-statistic, and LM test results. Referring to the null hypothesis, there is no serial correlation between variables. We conclude from the results that the null hypothesis is accepted because the p-values (chi-square) result is higher than the 5% significance level. The same goes for the heteroskedasticity test and normality distribution. The p-value results conclude that the model has no heteroskedasticity and the distribution is normal.

Table 3: Results of the robustness of the model

|	Probability	H_o: There is no serial correlation
Durbin Watson stats	1.457	
Q-statistic	All data p-value>0.05	
LM Test (Breusch Godfrey Serial correlation)	Chi square (1) =0.2393 with 1 lag	We accept Ho-
LM Test (Breusch Godfrey Serial correlation)	Chi square (2) =0.3337 with 2 lags	There is no serial Correlation
LM Test (Breusch Godfrey Serial correlation)	Chi square (3) =0.3704 with 3 lags	
LM Test (Breusch Godfrey Serial correlation)	Chi square (4) = 0.1557 with 4 lags	

Source: Author's calculation

	Prob.chi-Square (5)	**H_o: There is no heteroskedasticity**
Heteroskedasticity	0.2793	We accept Ho- There is no heteroskedasticity

Source: Author's calculation

	Jarque-Bera	**Prob.**	**H_o: There is normality between residuals**
Normal distribution	1.46	0.48	We accept Ho- The model has a normal distribution

Source: Author's calculation

We ran the model for stability, and the result from the CUSUM test stated the stability of the model for the 5% significance level (see Graph 2).
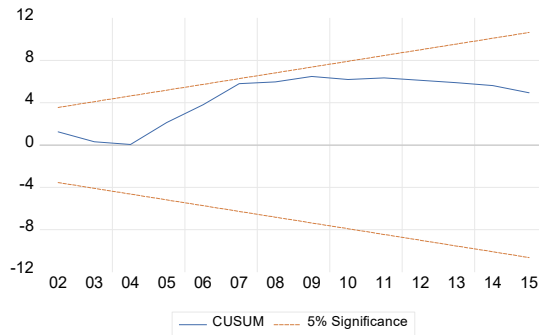
Graph 1: Stability Test at 5% level of significance
Source: *Author's* calculation (EViews results)

4.1   Unit root Test estimation

Table 4 and Table 5 present the result of the Augmented Dickey-Fuller (ADF, 1979) test, Philips Perron (PP), and KPSS to identify the level of integration of this variable to determine their stationarity. We are based on the hypothesis below to run the tests when we accept the alternative hypothesis when the probability of t-statistics is greater than the critical value of MacKinnon (1991) and. Estimation results from the table means that we reject the null hypothesis because of they are less than the 5% level of significance. From the result we conclude that the variables are stationary (with no unit roots).

H_0: Variables have unit root test (Series are not stationary)
H_1: Variables do not have unit root test (Series are stationary)

Table 4: Unit Root Test (constant)

Constant						
	ADF	Prob.	PP	Prob.	KPSS	Prob.
SE	I(2)	0.000	I(1)	0.0093	I(1)	0.2371<0.463**
GDPG	I(0)	0.0022	I(0)	0.0022	I(0)	0.3608<0.463**
M2/GDP	I(1)	0.0012	I(1)	0.0014	I(1)	0.13<0.46**
PrvCrdBank	I(2)	0.0509*	I(2)	0.0480	I(1)	0.1376<0.463**
TO	I(1)	0.0143	I(1)	0.0143	I(1)	0.2866<0.463**
Inflation	I(0)	0.0016	I(1)	0.0001	I(0)	0.364<0.463**

*>0.05-not significant; **critical value (5%) from KPSS test

Source: Author's calculation

Table 5: Unit Root Test (constant+ trend)

|	Constant+Trend		Constant+Trend		Constant+Trend	
	ADF	Prob.	PP	Prob.	KPSS	Prob.
SE	I(2)	0.0024	I(1)	0.0023	I(0)	0.135<0.146**
GDPG	I(0)	0.0081	I(0)	0.0040	-	-
M2/GDP	I(0)	0.0171	I(1)	0.0034	I(0)	0.1003<0.146**
PrvCrdBank	-	-	-	-	I(0)	0.094<0.146**
TO	-	-	I(1)	0.0011	I(1)	0.1078<0.146**
Inflation	I(0)	0.0151	I(1)	0.0002	I(0)	0.1033<0.146**

*>0.05-not significant; **critical value (5%) from KPSS test

Source: Author's calculation

From the table above, we can conclude that the variables reach stationary at different integration levels. GDP growth and inflation are stationary in I(0). Broad Money and trade openness are stationary at most first difference levels. Most complex variables result in Shadow economy and Private credit with the higher integration at the second level I(2) (as ADF and PP test show). In contrast, if the trend is considered, the KPSS test converts these variables stationary in I(1) with only constant or in I(0). Having different results with the level of the integration from different unit roots tests, we will proceed with Toda Yamamoto (TY) Granger causality, which one does not require if the variables are stationary and at which level. Important is only the highest integration that one of these variables reaches, in this case, is the second level I(2).

In addition, after running a simple, unrestricted VAR is necessary to identify the optimal lag length to proceed with TY. To test if the model is stable, we run inverse roots of AR characteristics, and from Graph 2, we conclude that the model is sound and no unit roots lie outside the circle.
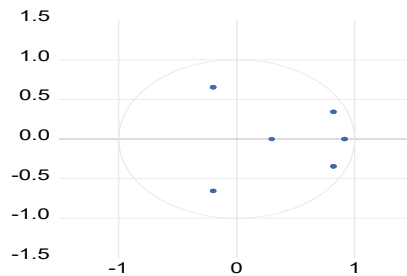
Graph 2: The model is stable in its unit root
Source: Author's calculation (EViews result)

Having determined the variables' stationarity level, we examine the lag length through Akaike Information Criterion (AIC) and Schwarz Information Criterion (SC) values. Considering that variables are annual data, the appropriate delay length is one year. In Table 6, we estimate the optimal lag with AIC and SC, as the lowest value is that of AIC with 26.019, stating that the lag is 1 (the same is for SC).

Table 6: Results from Lag length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-319.03	NA	29129782	34.21	24.51	34.264
1	-205.18	143.80	9999.263	26.019*	28.107	26.37

*Lag length selected by the criterion

Source: Author's calculation

4.2   Toda-Yamamoto Granger Causality Analysis and Results

After determining the right lag length (p) and the maximum level of integration (d_{max}) of the series, we proceed with the new VAR (p+d_{max}) model to estimate the TY approach. In this case, the estimated VAR (1+2) will require that the exogenous variables be included with all the variables with a delay time of (-3). In Table 7 are presented the estimation of TY.

Table 7: Results from Toda Yamamoto Granger Causality

Hypothesis	Chi-square	Df	Prob
M2/GDP Granger Cause SE	7.99	1	(0.0047 < 5%)
Trade Openness Granger Cause SE	12.03	1	(0.0005 < 5%*)
All variable together Granger cause SE	20.55	5	(0.0010 < 5%*)
M2/GDP Granger cause Private Credit	5.52	1	(0.00188 < 5%*)
All variable together Granger cause Private Credit	19.1	5	(0.0018 < 5%*)
M2/GDP Granger causes TO	4.11	1	(0.0426 < 5%*)

Source: Author's calculation

As we see from the table, one of the financial development variables (M2/GDP) causes the SE, and the same goes for M2/GDP causes private credit and trade openness. The direction causality between M2/GDP and the shadow economy, private credit, and trade openness is a one-way direction. Also, Trade openness has a one-way direction relationship with the shadow economy.

4.3 Regression

To identify the sign and if the variable is significant in a simple regression model, we run the least squares method (LS) to determine the impact of independent variables on dependent one. The study aims to empirically estimate how financial development (with two proxies M2/GDP and Private credit by banks) and supplementing variables affect the shadow economy. The model of regression model is based on the model proposed by Njangang et al. (2022), Ajide & Dada (2022), Remeikiene et al. (2021), Massil & Noah (2019), Veiga & Rohman (2017) as follow:

$$SE_t = c + \beta nFD_t + \beta_1 Inf_t + \beta_2 TO + \beta_3 GDP + \theta t + \varepsilon_{it}$$

SE_t is the variable that represents the shadow economy; FD_t represents M2/GDP and Private Credit by banks. Trade Openness, GDP growth, and inflation are considered control variables. εit represents the error term, and θ_t is time-specific effects. Table 5 are given the results from regression estimation 5.

Table 5: Results from Regression analysis

Dependent variable - SE		
Variable	**Coefficient**	**Probability**
PrivCrd	-0.226	0.000
M2/GDP	-0.019	0.738
GDPG	0.15	0.051
Infl	0.066	0.278
TO	-0.086	0.075
R-squared	0.97	
F statistics	105.31	
Prob (Fstatistics)		0.0000

Source: Author's calculation

The variable private credit from banks is significant at 5% and negatively affects SE. If anything else is zero and an increase in private credit from banks, there would be a decrease of 0.22 units of the shadow economy. The same goes even with the other variable of financial development, M2/GDP, which negatively affects SE but is insignificant. If M2/GDP increases by one unit, SE decrease by 0.019 unit. GDP growth positively impacts SE; when GDP growth increases by 1 unit, an increase by 0.15 units would be for SE, but GDP growth is significant only at a 1% significance level. Inflation has a

positive impact on SE, and TO has a negative effect on SE, but both variables are insignificant.

5. Conclusion

Due to their dynamic nature, financial development, shadow economy, and economic growth may affect economic activities. They consider that one of the reasons for having a more inclusive formal economy is due to how developed the financial system is.

Financial development ensures that money can be tracked more quickly, helping create a no-cash economy and helping individuals and firms benefit from various financing possibilities and easy access to credit and investments. Financial actors, such as firms and individuals that operate in the informal economy, need help to secure credit or access to new possibilities for investments. Otherwise, a formal economy will encourage them to achieve many goals for their family and business.

This study empirically estimates the relation and the impact of financial development on the shadow economy. The proxies used for measuring financial development were based on the banking sector, as Albania has not a developing capital market. In addition, the study aimed to identify a relationship with other economic growth variables such as GDP growth, inflation, and trade openness.

To proceed with a study of annual time series for Albanian data from 1995 to 2015, we tested the stationarity and lag length of the variables. Due to the different levels of integration that the variables needed to convert to stationary series, we chose Toda Yamamoto causality for the causality test. Broad money as a percentage of GDP was one of the essential proxies' grangers causing the shadow economy, domestic credit to the private sector (by banks, %GDP), and trade openness. From the results, we conclude that the shadow economy will decrease if broad money (financial development) increases, as stated in theoretical literature (Njangang et al., 2020; Bose et al., 2012; Berdiev & Saunoris, 2016). In a growing economy, Broad Money is considered a valuable measure of the actual scale of the financial system, considering it is a savings and payment tool (Dushku, 2009). Broad Money shows how financial inclusion is realized but needs to identify how the funds are allocated. Since Albania is part of developing economies has a higher value of money in cash because of the lack of investment alternatives (Vangjel & Mamo, 2022). Our results are in the same line as the literature (Massenot & Straub, 2011), even for trade openness which causes decreases in the shadow economy, boosting the formality. However, this variable is insignificant in our case.

The literature shows causality between financial development and the shadow economy (Bayar & Oztürk, 2019; Bose et al., 2012; Massenot & Straub, 2011). The same result is obtained even in our empirical estimation, where financial development (broad money proxy) affects the shadow economy for the Albanian case. As a country struggling with the shadow economy is essential to take into consideration the effect of financial development and trade openness on the informal economy. Also, the development of the financial sector has been shown to have an essential impact on causing private credit by banks and trade openness, developing the economic growth of Albania.

The impact of the informal sector requires the government to build its policies and reforms cautiously. As we know, corruption will increase informality, increasing the cost of formality. Also, poor policy and reforms on financial development and trade openness will increase the possibilities of an informal sector, penalizing the formal sector. Hence, it may be necessary to consider that reforms and a decisive fight against informality can be made through financial inclusion and increasing export and import levels.

How to reduce informality through financial development and trade openness as Djankov et al. (2002) suggest some new approaches regarding a new era in the relationship between business and government:

- Improving Trade Openness:
   Decreasing the number of enterprise licenses; improving how to do business; lower administrative and cost operations; digitalizing administrative procedures; boosting online

information and applications; and avoiding contacts with administration.
- Improving Financial Development:
  Enhancing access to capital markets and non-cash payment; Advance in the legalization process of mortgages.

6. Limitations and Future Studies

The study has some limitations, like the low number of observations due to the problem of gathering data for many years for Albania. Other financial development proxies can be the capital market and financial development as an index. However, they are difficult to include due to the high percentage of banking assets, over 90% of total assets to the Albanian financial system. As the literature suggested, other channels of economic growth can affect the shadow economy, such as foreign direct investment (FDI), productivity improvement, and other proxies, such as how technology affects information and communication (ICT), known as an important variable in decreasing the shadow economy. Despite all the suggestions above, in the future study, I will concentrate on panel data empirical estimation, including other countries such as Balkan countries.

7. Acknowledgments

References

Ajide, F. M. (2021). Shadow economy in Africa: How relevant is financial inclusion? *Journal of Financial Regulation and Compliance*.

Ajide, F. M., & Dada, J. T. (2022). The impact of ICT on shadow economy in West Africa. *International Social Science Journal*.

Aslan, Ö., and Korap, HL (2006). The relationship between financial development and economic growth in Turkey. Muÿla University *Journal of Social Sciences Institute (ILKE)*, 17, 1–20. http://www.sobbiad.mu.edu.tr/index.php/asd/article/view/185

Badariah, H. D., Habibullah, M. S., & Baharom, A. H. (2015). Does the shadow economy matter for tourism? International evidence. Taylor's Business Review, 5(1), 1-9.

Bayar, Y., & Ozturk, O. F. (2016). Financial Development and Shadow Economy in European Union Transition Economies. Managing Global Transitions: *International Research Journal*, 14(2).

Beck, T., & Hoseini, M. (2014). Informality and access to finance: Evidence from India (*CentER Discussion Paper Series No. 2014-052*). Available at SSRN: https://ssrn.com/abstract=2491466 or http://dx.doi.org/10.2139/ssrn.2491466

Becker, K. F. (2004). The informal economy: Fact finding study.

Becker, G. S. (1968). Crime and punishment: An economic approach, The economic dimensions of crime (pp. 13–68). London: Palgrave Macmillan.

Benjamin, C. N., & Mbaye, A. A. (2010). Informality, productivity, and enforcement in West Africa: A firm analysis (No. 100). *Working paper series*

Berdiev, A. N., & Saunoris, J. W. (2016). Financial development and the shadow economy: A panel VAR analyses. *Economic Modelling*, 57, 197–207.

Biswas, A. K., Farzanegan, M. R., & Thum, M. (2012). Pollution, shadow economy, and corruption: Theory and evidence. *Ecological Economics, pp.* 75, 114–125.

Blackburn, K., Bose, N., & Capasso, S. (2012). Tax evasion, the underground economy, and financial development. *Journal of Economic Behavior & Organization, 83*(2), 243–253.

Bode R., Muca B., Doraci G., Keco R., (2011). Albania-Ways of reducing informality and the economic crises effects in Albania.

Bose, N., Capasso, S., & Andreas Wurm, M. (2012). The impact of banking development on the size of shadow economies. *Journal of Economic Studies*, 39(6), 620–638.

Canh, NP, & Thanh, SD (2020). Financial development and the shadow economy: a multi-dimensional analysis. *Economic analysis and policy*, 67, 37–54. https://doi.org/10.1016/j.eap.2020.05.002

Capasso, S., & Jappelli, T. (2013). Financial development and the underground economy. *Journal of Development Economics*, 101, 167–178.

Dawson, P. J. (2003). Financial development and growth in economies in transition. *Applied Economics Letters*, 10(13), 833–836.

Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411.

Djankov, S., Lieberman, I., Mukherjee, J., & Nenova, T. (2002). The informal economy. *Round table*, April.

Dreher, A., & Schneider, F. (2010). Corruption and the shadow economy: An empirical analysis. *Public Choice*, 144(1–2), 215–238.

Dushku, E., (2009). "Zhvillimi Financiar dhe Rritja Ekonomike, Rasti i Shqipërisë", Buletini Ekonomik, Banka e Shqipërisë, 12, 143.

Elgin, C., & Uras, B. R. (2013). Public debt, sovereign default risk, and the shadow economy. *Journal of Financial Stability*, 9(4), 628–640.

Engel, R.F.,&Granger, C.W.J.(1979).Co-integration and error correction model: Representation, estimation, and testing: Econometrician, 55, 251–276.https://doi.org/10.2307/1913236

Erdem, E. (2010). Money Bank and Financial System. Ankara: *Detay Publishing*

Gatti, R., & Honorati, M. (2008). Informality Among Formal Firms: Firm-Level. Cross-Country Evidence On Tax Compliance And Access To Credit World Bank Policy Research paper, 4476.

Gërxhani, K., & Schram, A. (2006). Tax evasion and income source: A comparative experimental study. *Journal of Economic Psychology*, 27(3), 402-422.

Gharleghi, B., & Jahanshahi, AA (2020). The shadow economy and sustainable development: The role of financial development. *Journal of Public Affairs*, 20(3), 1–6. https://doi.org/10.1002/pa.2099

Gobbi, G., & Zizza, R. (2012). Does the underground economy hold back financial deepening? Evidence from the Italian credit market. *Economia Marche, Review of Regional Studies*, 31, 1.

Kapıcıoğlu, R. (2022). The Shadow Economy and Financial Development in the Turkish Economy. Journal of Public Finance Studies, (68), 67-80.

Keneck-Massil, J., & Noah, A. (2019). Shadow economy and educational systems in Africa. *Economics Bulletin*, 39(2), 1467–1478.

Khan, M. S., & Senhadji, A. S. (2000). Financial development and economic growth: *An overview.*

Khan, S., Abdul Hamid, B., & Rehman, MZ (2021). Determinants of shadow economy in OIC and non-OIC countries: The role of financial development. *International Journal of Emerging Markets*. https://doi.org/10.1108/IJOEM-02-2020-0193

Kim, B. Y. (2005). Poverty and informal economy participation: Evidence from Romania. *Economics of Transition*, 13(1), 163–185.

King, R. G., & Levine, R. (1993). Finance, entrepreneurship, and growth. *Journal of Monetary economics*, 32(3), 513–542.

La Porta, R., & Shleifer, A. (2008). The unofficial economy and economic development (No. w14520). *National Bureau of Economic Research*.

Lensink, R. (2001). Financial development, uncertainty, and economic growth. *De Economist*, 149(3), 299-312

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American economic review*, 537-558.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature.*

Schneider, F., & Enste, DH (2000). Shadow Economies: size, causes, and consequences. *Journal of Economics.*

Svirydzenka, K. (2016). Introducing a new broad-based index of financial development. *International Monetary Fund.*

Liu, W. C., & Hsu, C. M. (2006). The role of financial development in economic growth: The experiences of Taiwan, Korea, and Japan. *Journal of Asian Economics*, 17(4), 667-690

Loayza, N., Oviedo, A. M., & Servén, L. (2004). *Regulation and macroeconomic performance. World Bank Policy Research* (No. 3469). Working Paper.

Massenot, B., & Straub, S. (2011). Informal sector and economic growth: the supply of credit channel.

Mazhar, U., & Méon, P. G. (2012). Taxing the unobservable: The impact of the shadow economy on inflation and tax revenue (No. 12-023). Working Papers CEB.

Medina & Schneider (2018). - Medina L., Schneider F., "Shadow Economies Around the World: What Did We Learn Over the Last 20 Years? Prepared by Leandro Medina and Friedrich Schneider", IMF Working Paper (2018)

Muceku, H., & Balliu, T. (2017). The Albanian Taxpayers' Perception of the Current Tax System and Its Impact on Informal Economy, Tax Evasion and Tax Avoidance. Mediterranean Journal of Social Sciences, 8(1), 470. Njangang et al. 2022),

Njangang, H., Noubissi, E., & Nkengfack, H. (2018). Do remittances increase the size of the informal economy in sub-Saharan African countries? *Economics Bulletin*, 38(4), 1997–2007.

Njangang, H., Nembot, L. N., & Ngameni, J. P. (2020). Does financial development reduce the size of the informal economy in sub-Saharan African countries?. *African Development Review*, 32(3), 375-391.

Rajesh Raj, S. N. (2007). Technical Efficiency in the Informal Manufacturing Enterprises: Firm level evidence from an Indian state.

Rajan R., G., Ingales L., (1998). "Financial Dependence and Growth" The American Economic Review, vol. 88, no. 3, American Economic Association, pp. 559–86.

Remeikienė, R., Gasparénienė, L., Bayar, Y., Ginevičius, R., & Ragaišytė, I. M. (2021). ICT development and shadow economy: Empirical evidence from the EU transition economies. *Economic Research-Ekonomska Istraživanja*, 1-16.

Rosser, J. B., Jr., Rosser, M. V., & Ahmed, E. (2000). Income inequality and the informal economy in transition economies. *Journal of Comparative Economics*, 28(1), 156–171.

Loayza, N., Oviedo, A. M., & Servén, L. (2004). Regulation and macroeconomic performance. *World Bank Policy Research* (No. 3469). Working Paper.

Sarte, P. D. G. (2000). Informality and rent-seeking bureaucracies in a model of long-run growth. *Journal of Monetary Economics*, 46(1), 173–197.

Schneider, F., & Enste, DH (2000). Shadow Economies: size, causes and consequences. Journal of Economics Sviridzenka, K. (2016). Introducing a new broad-based index of financial development. *IMF Working Paper* 16/5. 35(2), 688–726. Literature, 38, 77–144.

Schneider, F. (2006). Shadow economies around the world: What do we know? *In CESifo Working Paper* No.1806.

Schneider, F. (2008). Shadow economies and corruption all over the world: what do we really know?. In *The shadow economy, corruption, and governance* (pp. 122-187). Edward Elgar Publishing.

Schneider, F. (2015). Size and development of the shadow economy of 31 European and 5 other OECD countries from 2003 to 2014: different developments? *Journal of Self-Governance and Management Economics,* 3(4), 7-29.

Straub, S. (2005). Informal sector: The credit market channel. *Journal of Development Economics,* 78(2), 299–321.

Toda, H.Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes, *Journal of Econometrics*, 66, 225-250

Vangjel, R., & George, B. (2022). Balkan Financial Development and Its Impact On Economic Growth: Granger Causality. *Journal of Governance and Regulation*/Volume, 11(4).

Vangjel, R., & Mamo, J. (2022). Development of the Financial Sector and Its Impact on Economic Growth in the Western Balkans.

Veiga, L., & Rohman, I. K. (2017, September). e-Government and the shadow economy: evidence from across the globe. In *International Conference on Electronic Government* (pp. 105-116). Springer, Cham.

Veliu M., (2008). "The Role Of Albanian Fiscal Policies To The Improvement Of The Economy Situations," Euro Economica, *Danubius University of Galati*, issue 2(21), pages 102–110, December.

Khuong, N. V., Shabbir, M. S., Sial, M. S., & Khanh, T. H. T. (2021). Does the informal economy impede economic growth? Evidence from an emerging economy. *Journal of Sustainable Finance & Investment*, 11(2), 103-122