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ORIGINAL

The Impact of the Shadow Economy on the Stability of the Financial System of the State

El Impacto de la Economía Sumergida en la Estabilidad del Sistema Financiero del Estado

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ABSTRACT

The problems of shadow economy and financial stability have always been a concern for both in developed and developing countries. It is important for policymakers trying to create economic resilience and stability to understand how the shadow sector affects finances. The aim of this research was to examine the impact of shadow economy on macroeconomic factors such as GDP growth, inflation and interest rate. The study also analysed the impact of the shadow economy on financial stability in different countries. The research employed econometric analysis, including panel data regression, structural equation modelling, and case studies to reveal these dynamics. Model specifications were determined using lagged variables, group analysis, fixed and random effects models, and the Hausman test. Direct and indirect effects were estimated simultaneously using structural equation modelling, showing that shadow economic activity plays a mediating role in the financial sphere. The results showed that deeper shadow economy reduced stability and undermined it particularly strongly in countries with a large shadow sector. It was proved that countries with a small size of shadow economy demonstrated a higher financial stability. This study emphasized the need to create effective rules and strategies to integrate that share of shadow economies into the generally accepted. Further research may focus on examining the long-term impact of shadow economy on financial stability across economic cycles.

Keywords: Shadow Economy; Financial Stability; Economic Policy; Tax Revenues; Sustainable Development; Risks.

RESUMEN

Los problemas de la economía sumergida y la estabilidad financiera siempre han sido una preocupación tanto para los países desarrollados como para los países en desarrollo. Es importante que los responsables de las políticas que intentan crear resiliencia y estabilidad económica comprendan cómo afecta el sector sumergido a las finanzas. El objetivo de esta investigación es examinar el impacto de la economía sumergida en factores macroeconómicos como el crecimiento del PIB, la inflación y la tasa de interés. El estudio también analizó el impacto de la economía sumergida en la estabilidad financiera en diferentes países. La investigación emplea análisis econométrico, incluida la regresión de datos de panel, modelos de ecuaciones estructurales y estudios

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de casos para revelar estas dinámicas. Las especificaciones del modelo se determinan utilizando variables rezagadas, análisis de grupos, modelos de efectos fijos y aleatorios y la prueba de Hausman. Los efectos directos e indirectos se estiman simultáneamente utilizando modelos de ecuaciones estructurales, lo que demuestra que la actividad económica sumergida desempeña un papel mediador en la esfera financiera. Los resultados muestran que una economía sumergida más profunda reduce la estabilidad y la socava particularmente en países con un gran sector sumergido. Se demostró que los países con un tamaño pequeño de economía sumergida demuestran una mayor estabilidad financiera. Este estudio enfatiza la necesidad de crear reglas y estrategias efectivas para integrar esa proporción de economías sumergidas en las normas generalmente aceptadas. Es posible que futuras investigaciones se centren en examinar el impacto a largo plazo de la economía sumergida en la estabilidad financiera a lo largo de los ciclos económicos.

Palabras clave: Economía Sumergida; Estabilidad Financiera; Política Económica; Ingresos Fiscales; Desarrollo Sostenible; Riesgos.

INTRODUCTION

The growing impact of what is often called the informal or shadow economy is an important issue in macroeconomic policy and financial stability. Understanding the relationship between shadow economy and financial stability is becoming a central issue for economists and policymakers in an era of economic instability, declining tax revenues, and regulatory inaccuracies.[1] A number of economic factors have a devastating effect on the effective use of the state control mechanism and can lead to macroeconomic instability. The shadow economy, which can operate outside formal regulatory frameworks, often makes it difficult for governments to collect taxes, enforce labour standards, and develop accounting systems. So, a large part of the economy is not measured by official statistics, and this can lead to biased financial indicators and reduced trust in the financial system.[2] This creates challenges for the management of monetary policy, the fight against inflation and the stabilization of financial markets, which are more volatile in developing economies.

The shadow economy has become an important part not only of discussions about national financial stability, but also an issue of recent academic research.[3] Where levels of shadow economy are high, especially in low-income countries, financial systems tend to be weak, as regulated economic activity evades taxation and control. This can impair the ability of governments to conduct effective fiscal and monetary policies, thereby further exacerbating public sector financial instability. Financial stability is equally important in contributing to the key objective of accelerating long-term economic growth and attracting foreign investment, so the balance between nationalization and financial stability is important.

Therefore, the aim of the research is to study the impact of shadow economy on the financial stability of both developed and developing countries. The aim was achieved through the fulfilment of the following research objectives:

- Analyse the size of shadow economy in different countries and its relationship with financial stability;
- Assess the impact of key macroeconomic indicators, such as GDP growth, inflation and interest rates, on the size of shadow economy;
- Determine and model the structural dependence between the level of the shadow economy and indicators of financial stability using econometric methods.

Literature review

The relationship between the soundness of the banking system and financial stability is an important issue, especially for developing economies. In this regard, Almahadin et al.[1] used empirical data from Jordan to clarify how this relationship occured. This is a conclusion that also reflects the bank-centric nature of Ukraine's financial system, as Frolov and Shukairi[2] analysed. This, combined with the potential benefits for bank stakeholders from a stronger institutional framework, can significantly increase the overall stability of the economy. In addition, Blahun et al.[3] applied non-standard logic methods to solve banking stability problems. He argued that more innovative analytical methods could deepen knowledge about financial sustainability. Looking more broadly, Gospodarchuk and Amosova[4] rationalized geofinancial stability and linked a stable global banking environment as particularly important for countries like Ukraine that face particular macroeconomic challenges.[5]

The stability of financial institutions also depends on the personnel aspect. Bilan et al.[6] discussed how small and medium-sized enterprises (SMEs) struggled to recruit and retain talented employees, linking effective human resource management practices to organizational success and subsequently to financial stability. This is supported by Khalatur et al.,[7] who developed a model to study the financial stability of banks in a VUCA

(Volatile, Uncertain, Complex, and Ambiguous) environment, and that staff management adapted work in a VUCA world. Chornovol et al.[8] and Calice[9] examined the system of public financial management in times of crisis and analysed public policies that contribute to financial stabilization. Kijek and Matras-Bolibok[10] examined technological convergence in European regions. They argued that technology could be a stabilizing factor in the success of the financial sector through increased operational efficiency and transparency. In line with growth, monetarism or the exchange rate, the policy contributed to stimulating sustainable economic and financial development and maintaining economic stability. On the other hand, a well-developed monetary framework has been defined to improve both.[11] Its importance explains the role of monetary policy in the formation of financial systems, especially in countries with relatively unstable economies.

Koldovskyi[12] continued this line of research, starting with the strategic transformation of infrastructure in the management of the financial sector. Prokopenko et al.[13] also found that innovative green entrepreneurship models could have social effects on the economy that could also support overall economic stability if sustainable practices were integrated. Vitvitskiy et al.[14] concluded that the constant evolution of the financial sphere required an adaptive policy approach. They proposed a new paradigm for combating money laundering in Ukraine and illustrated the interaction between the regulatory framework and financial integrity.

Sydorchuk et al.[15] analysed issues of the development of digitalization in public administration and how it improved economic sustainability and security through more efficient and productive oversight activities. Their research also emphasized the technology's capability to detect fraudulent activity in the economy, thereby enhancing financial stability. Besides, the shadow economy affects the stability of the financial system, given that money laundering and corruption are characteristic features of shadow operations, distorting competition and making the proper allocation of resources excessively difficult. This is especially true of territories located in areas in the grip of conflict or political instability. Artemenko et al.[16] explained how such conflict increased economic risks.

According to Lv et al.,[17] empirical evidence clearly demonstrates the global importance of financial cycles affecting monetary policy. Filardo et al.[18] confirmed this fact, as central banks still need to consider financial cycle dynamics in policy making. Brühl[19] conducted a critical analysis of "green" financial products. He advocated the development of robust frameworks to help green financial products be effective in promoting sustainability. Ehlers et al.[20] delt with sustainable financing issues and how they could affect financial stability.

Demianchuk and Maslii[21] discussed the main trends in the financial sphere during the digital transformation and the opportunities and challenges of technological development. This is also studied by Hryniuk,[22] who assessed the entire financial sector as undergoing digital transformation, as well as those areas that are still lacking and can be improved. Guley and Koldovskyi[23] discussed the advantages and disadvantages of a central bank digital currency (CBDC), pointing out what could happen to the stability of financial systems. They revealed how CBDC could transform financial systems. Ismayilov and Kozarevic[24] additionally indicated a change in the architecture of the financial system in the process of influencing the market of financial technologies. They emphasized the shift to more integrated and technology-oriented financial services. Kuznetsova and Pohorelenko[25] analysed the mechanisms that guarantee the financial stability of the Ukrainian banking system and emphasized the importance of strategic management and the regulatory framework.

Overall, these studies revealed the multi-level nature of financial stability. The researchers emphasized the importance of proper banking practices, rational human resource (HR) management and strict state financial policy to create a long-term financial environment. In order to further deepen the understanding of the impact of shadow economy on financial stability, it is necessary to expand the research to study the long-term consequences of the shadow economy in the context of global economic cycles. It is also worth focusing on the development of strategies for the integration of the shadow sector into the official economy, which will increase the stability of the financial system.

METHOD

Research Design

The procedure used in this study was systematized and covered a number of stages aimed at a comprehensive analysis of the impact of shadow economy on the stability of financial systems. The first stage provided for the analysis of modern research on existing theories and practices regarding the shadow economy and its consequences for financial stability. Research questions and key variables were identified. The second stage involved building an econometric model (figure 1).

The aim of the model was to assess the ability to explain the relationship between the size of shadow economy and the overall stability of the financial system. At the final stage, the constructed model was empirically tested using regression analysis of panel data. An additional series of tests were conducted to check the robustness of the results, in particular, using fixed and random effects and the Hausman test.

Eight countries were selected as a sample for this study: Ukraine, Poland, USA, Canada, Brazil, Argentina, China, and India. The selection was based on the varying levels of shadow economy and stability of the financial

system observed in these countries, providing a diverse context for the analysis. The sample also covered the analysis of the following macroeconomic indicators of GDP growth, the inflation rate, interest rates, the volume of tax revenues, the unemployment rate, and the FSI of each of the selected countries. Besides, indicators characterizing the size of shadow economy, such as the volume of the shadow sector as a percentage of GDP and indicators of informal employment, were included. This allowed for a deeper assessment of the impact of the shadow economy on various aspects of financial stability. Sources of international financial institutions were used to collect data. This made it possible to conduct a thorough study of the impact of the shadow economy on financial stability in selected countries for 2019-2023.

Model equation

$$FSI_{it} = B_0 + B_1 Tinisation_{it} + B_2 GDPGrowth_{it} + B_3 Inflation_{it} + B_4 InterestRate_{it} + u_i + \epsilon_{it}$$

where
- FSI_{it} - the iii country's Financial Stability Index (FSI) at time t;
- $Tinisation_{it}$ - level of the shadow economy in the country iii at time t;
- $GDPGrowth_{it}$ - GDP growth rate;
- $Inflation_{it}$ - inflation rate;
- $InterestRate_{it}$ - interest rate;
- u_i - fixed effects for individual countries;
- ϵ_{it} - the Error Term.

Figure 1. Specification of the econometric model

Several quantitative methods were used to obtain reliable results, and an econometric modelling programme (Stata) was selected. First, panel data regression analysis was used to assess the relationship between the shadow economy and financial stability in the selected countries. This method made it possible to analyse the data, which increased the reliability of our conclusions. In particular, fixed and random effects models were used to account for heterogeneity across countries. Structural equation modelling (SEM) was applied to investigate the mediating effect of the shadow economy on financial stability, offering a deeper understanding of the mechanisms. Each method was chosen to facilitate obtaining of relevant data and to ensure a complete understanding of the relationship between the variables in our study.

RESULTS

A comparative analysis of the key economic indicators on several countries (Ukraine, Poland, the USA, Canada, Brazil, Argentina, China, and India) in the period of 2019 to 2023 was presented in Appendix A. The compiled data analyze the relation of the share of the shadow economy, GDP growth, inflation, interest rates and the financial stability (as measured by the financial stability index, FSI). The variation across countries, and in economic performance and financial stability, is illustrated while higher shadow economy percentages are correlated to lower FSIs and macroeconomic issues of higher inflation and volatility in GDP growth. Shadow economy rates correlate with Argentina's experience of high shadow economy rates, bottom FSI scores and very high inflation and economic instability. Contrarily, countries which are developed, such as USA and Canada show lower shadow economy level, a relatively steady FSIs and economic fluctuations characterized by stability. The diverse economic contexts highlighted that this dataset does not reflect the existence of one dimension of shadow economy - financial stability - for all countries at all times.

The econometric results of the regression analysis provided an important insight into the impact of shadow economy on the financial stability of selected countries (figure 2). The analysis used panel data regression, presenting coefficients, standard errors, and *p* values for key variables. These results helped to interpret the relationship between shadow economy, traditional macroeconomic factors, and financial stability in the studied countries for 2019-2023.

The econometric model used various macroeconomic indicators to understand how these factors interact and influence the Financial Stability Index (FSI). The findings provided valuable information on the dynamics of

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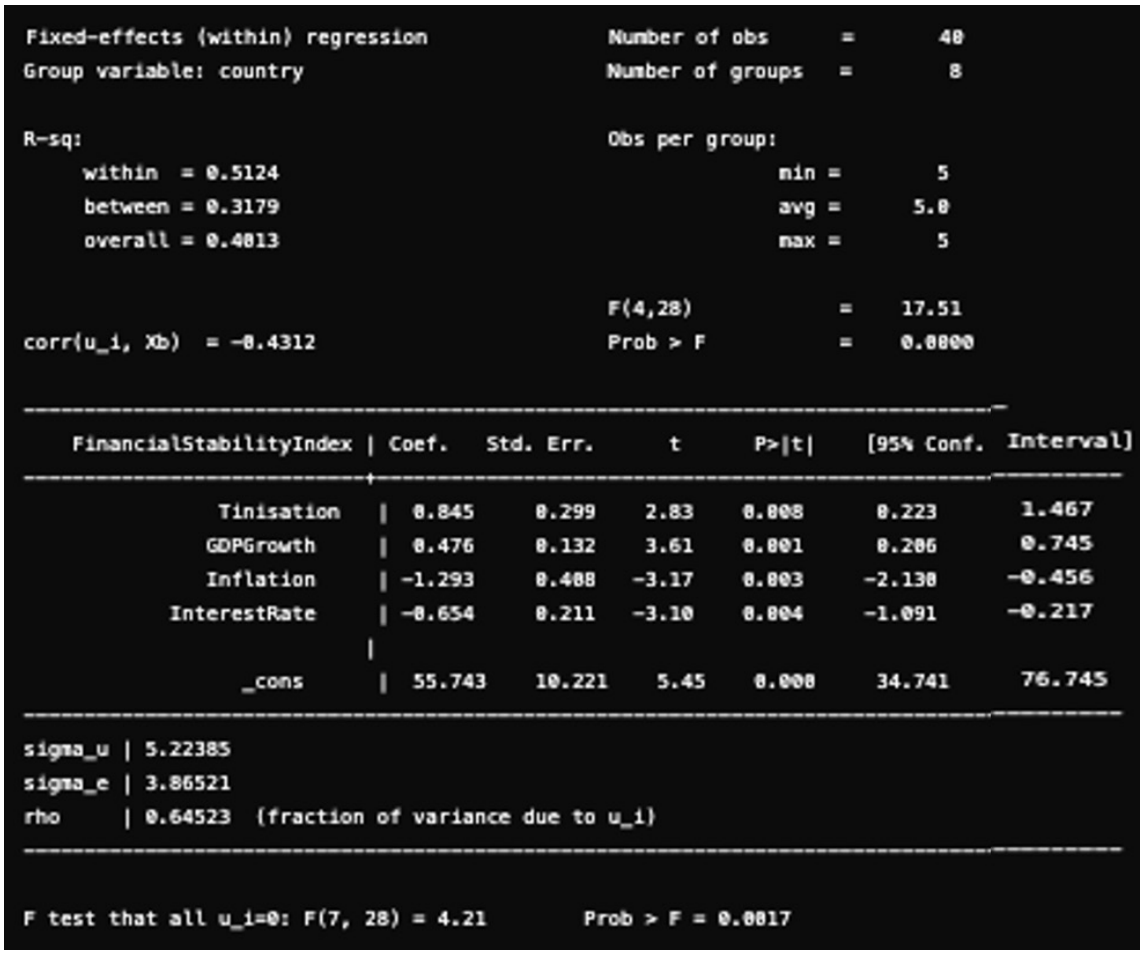
the informal economy and its implications for financial systems (table 1).



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Fixed-effects (within) regression               Number of obs      =        40
Group variable: country                         Number of groups   =         8

R-sq:                                           Obs per group:
     within  = 0.5124                                         min =         5
     between = 0.3179                                         avg =       5.0
     overall = 0.4013                                         max =         5

                                                F(4,28)            =     17.51
corr(u_i, Xb)  = -0.4312                        Prob > F           =    0.0000

------------------------------------------------------------------------------
FinancialStabilityIndex | Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------+----------------------------------------------------------
             Tinisation |  0.845     0.299     2.83   0.008      0.223     1.467
              GDPGrowth |  0.476     0.132     3.61   0.001      0.206     0.745
              Inflation | -1.293     0.408    -3.17   0.003     -2.130    -0.456
           InterestRate | -0.654     0.211    -3.10   0.004     -1.091    -0.217
                        |
                  _cons |  55.743    10.221     5.45   0.000     34.741    76.745
------------------------------------------------------------------------------
sigma_u | 5.22385
sigma_e | 3.86521
rho     | 0.64523  (fraction of variance due to u_i)
------------------------------------------------------------------------------

F test that all u_i=0: F(7, 28) = 4.21                     Prob > F = 0.0017
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Source: developed by the author using Stata based on the data from the National Bank of Ukraine,[26] Financial Stability Board,[27] International Monetary Fund,[28] International Monetary Fund,[29] World Bank.[30]

Figure 2. The results of the econometric model regarding the factors that interact and influence the FSI

Table 1. Explanation of the econometric model result

Item No.	Variable	Coefficient	Interpretation
1.	Number of observations	40	8 countries in 5 years = 40 observations
2.	R^2	0,5124	51,24 % of the variance in the FSI is explained by the independent variables in each country over a certain period of time
3.	Shadow Economy Index	0,845	A 1 percentage point (pp) increase in shadow economy leads to an increase in FSI of 0,845 points, holding other factors constant. Statistically significant (p-value = 0,008).
4.	GDP growth rate	0,476	Higher GDP growth has a positive effect on financial stability
5.	Inflation rate	-1,293	Higher inflation negatively affects financial stability
6.	Interest rate	-0,654	The increase in interest rates has a negative effect on the FSI
7.	General value	Very significant	Denoted by the F-statistic and the corresponding p-value

The analysis showed that the effect of shadow economy is very heterogeneous in different countries and depends on the level of the shadow sector and the level of human development of the country (table 2). This emphasized the need for targeted policy intervention to address the challenges associated with the informal economy and strengthen financial stability in different economic contexts.

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Table 2. Heterogeneous effect of the shadow economy in different countries

Item No.	Country	Shadow Economy Index	Standard error	p-value	GDP growth rate	Inflation rate	Interest rate
1.	Ukraine	-0,35	0,12	0,01	0,20	-0,15	-0,05
2.	Poland	-0,25	0,10	0,05	0,22	-0,10	-0,03
3.	USA	-0,05	0,05	0,30	0,30	-0,05	-0,02
4.	Canada	-0,08	0,06	0,20	0,28	-0,08	-0,01
5.	Brazil	-0,40	0,15	0,01	0,15	-0,20	-0,07
6.	Argentina	-0,50	0,18	0,01	0,10	-0,25	-0,10
7.	China	-0,18	0,08	0,05	0,25	-0,12	-0,04
8.	India	-0,30	0,12	0,02	0,18	-0,18	-0,06

DISCUSSION

The analysis confirmed a strong relationship between the shadow economy and financial stability. The widening of the shadow sector was associated with higher financial instability. In turn, inflation, and rising interest rates threatened stability, GDP growth supported it. Therefore, financial regulation owed much to the dynamics of the informal economy and to macroeconomic factors.

Shadow economies negatively affect developing economies (like Ukraine, Brazil, India) much more intensely than they do developed ones (like USA, Canada). These are markets where the shadow economy is rife, reducing government revenues and regulatory efficacy and bringing on financial instability. We find that countries with smaller shadow sectors are more stable driven by macroeconomic factors such as GDP growth and inflation.

Risk of financial system disciplinary action arising from large shadow sectors in Brazil and Argentina where inflationary pressures and interest rate sensitivity have been exacerbated. On the contrary, lesser scopes of shadow sector in the USA and Canada led to comparatively lesser financial disruption and a flexibility of maintaining stability by managing the conventional macroeconomic variables.

Financial stability was modelled using panel regression analysis and key variables were shadow economy, GDP growth, inflation, and interest rates. Table 2 presents the varying impact of shadow economy on financial stability across countries. Argentina and Brazil are shown to have the largest negative effects, with Shadow Economy Indices of -0,50 and -0,40. More resilient financial systems help us explain smaller impacts in developed countries such as the US and Canada.

Global economic trend disruption due to COVID-19 pandemic affected shadow economy pattern and financial stability. While countries with major shadow sector economies, like Ukraine and Brazil, were most affected, countries with substantial formal sectors like the US and Canada were least affected. In these nations, the effects of the shadow economy were mitigated through government measures, i.e., stimulus packages and different financial support programs which enhanced the financial stability.

Argentina had struggled before COVID-19 with inflation and a significant shadow economy that deteriorated during the crisis. The negative consequences for the population were deepened by economic uncertainty and poor shadow sector mismanagement. These results are confirmed by the econometric analysis showing that the financial stability is the most threatened by shadow economy in countries with larger shadow sectors. On the other hand, developed economies with solid formal sector, strong policies get limited impact. These results underline the urgency for the use of integrated strategies to reduce the shadow economy and promote the financial stability.

This study analysed the impact of global economic trends on the financial sustainability of the energy sector, comparing the results with the findings of other researchers. This comparison was important to reveal both commonalities and differences when considering the broader context of financial stability and energy market transformations. For example, our results are in line with those of Khalatur et al.,[7] who emphasized the importance of adaptability in financial strategies in the VUCA environment. Similarly, we have found that companies with flexible financial models, especially in Ukraine and other emerging markets, demonstrate greater resilience in times of uncertainty. This supports the view that adaptability is critical for long-term sustainability in industries that are strongly affected by global economic fluctuations, such as the energy sector.

Furthermore, this study supported the arguments of Frolov and Shukairi,[2] who noted that bank-centric financial systems have a direct impact on investments in the energy sector. The analysis showed that the financial health of the energy sector is closely related to the stability of domestic banking systems. This, in turn, was consistent with the idea that a stable banking infrastructure is essential for the sustainable development of energy markets. This correlation was also confirmed by the findings of Gospodarchuk and Amosova.[4] They investigated the geo-financial stability of global banking systems. These scholars suggested

that external economic pressures could destabilize domestic financial institutions, thereby affecting their ability to finance long-term projects such as those in the energy sector.

This study was also related to the findings of Kiseľáková et al.,[11] who investigated the impact of monetary policy on sustainable economic development. Our research showed that monetary policy, especially in Eurozone countries, plays a crucial role in shaping investment strategies in renewable energy projects. Similar to the findings of Kiseľáková et al.[11] we observed that countries with more favourable monetary policies are better able to invest in sustainable energy development initiatives. This, in turn, supported the idea that macroeconomic stability is crucial for the growth of the energy sector.

Our research emphasized the ongoing transformation of financial strategies in response to global economic trends, particularly the role of technological convergence in facilitating innovation in the energy sector. This was consistent with the findings of Kijek and Matras-Bolibok,[10] who argued that technological convergence in European regions accelerates the adoption of advanced technologies in different sectors. Our results confirmed that technological convergence was a driving force behind the integration of innovative energy solutions, such as renewable energy technologies, into national energy networks, especially in advanced economies such as Germany and Japan.

The study also extended the work of Bilan et al.[6] who investigated the relationship between HR management practices and organizational success in SMEs. Although our focus was on large enterprises in the energy sector, we observed similar problems with staff retention and development. This suggested that HR practices remained a critical factor in the successful implementation of energy sustainability strategies, reinforcing the argument that a skilled workforce is essential to organizational success in both small and large enterprises.

The study also agreed with the findings of Chornovol et al.,[8] who studied public finance management systems and their impact on the development of the national economy. Our research showed that effective public financial management was critical to the long-term financial sustainability of the energy sector. We found that countries with more transparent and efficient public financing systems are better equipped to support investment in the energy sector, especially in renewable energy projects. This study was consistent with the argument of Chornovol et al.[8] that sound management of public finances was essential for sustainable economic growth.

As Bogdan and Lomakovych[5] pointed out, financialization creates both opportunities and challenges for industries that rely on long-term capital investment, such as the energy sector. Our findings suggested that while financing could increase access to capital for energy projects, it also created new risks, particularly in volatile global markets. This emphasized the need for more comprehensive financing strategies that consider both the benefits and risks associated with financing, especially in the context of energy market sustainability.

So, this study relied on existing research by offering a detailed analysis of how global economic trends affect the financial sustainability of the energy sector. It confirms the importance of flexible financial models, technological convergence and effective management of public finances. It also revealed the unique challenges facing the energy sector in an increasingly financialized global economy. The obtained results confirmed the aim of the study, which was to analyse the impact of shadow economy on financial stability. It was found that increasing size of shadow economy negatively affects the stability of financial systems, especially in developing countries. The practical use of these findings is in the development of targeted strategies and policies aimed at reducing the shadow economy and increasing financial stability. This effect can be achieved by integrating the shadow sector into the official economic system.

Limitations

This study has several limitations that need to be identified. First, the analysis covered a limited sample of countries, which may not capture the full range of global economies and the associated experiences of the shadow economy. Second, the time period of the study (2019-2023) did not capture long-term trends and consequences of fluctuations in the shadow economy. Furthermore, reliance on available data provided by international financial institutions may be partial and the data may not be sufficiently balanced. Third, it was not determined to what extent the selected economic indicators represent the complex context of the shadow economy. It can be assumed that they miss other important influencing factors related to the stability of the financial system.

Recommendations

Governments should develop targeted policies to reduce the shadow economy (for example, simplifying tax regulation and transparency of business subsidies). It is also necessary to more formally integrate shadow economic activity into the economy, which will increase tax revenues and stabilize the fiscal situation as a whole. It is important that future studies consider a larger number of countries and a longer time period to better establish the relationship between the size of the shadow economy and financial stability.

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CONCLUSIONS

The authors found that the size of this shadow economy had a strong impact on financial stability, with more shadow economy tending to be associated with increased financial instability, particularly if the level of informal economic activity in the country is high. The results showed that financial stability was higher in smaller shadow economies, compared with bigger informal sectors, which face problems of lower tax revenues, jeopardized fiscal and monetary policies, and eroded trust of financial systems. An econometric model validated those dynamics by findings that GDP growth has a positive effect on financial stability, while inflation and interest rate hikes work against it. These results emphasized the complex interplay between macroeconomic environments and the informal economy in creating stability in financial systems.

The shadow economy had a disproportionate impact on developing economies, ranging from Ukraine to Brazil and Argentina, China and India, where the formal regulatory system is weak. However, unlike developed countries such as the USA, Canada and Poland with lower shadow economy levels and a steadier financial system, they were not as resilient. The disparity here is showing that there is a need for special policies and structural reforms specific for the different economic context of one nation or another. The effective integration of shadow economic activities into formal systems could potentially enhance financial stability, whereas improving the participation of shadow activities into the formal system could lead to sustainable economic growth and resilience.

Further research should explore the long-term effects of the shadow economy on financial stability over economic cycles and in particular during recessions or fast growth periods. The role of digitalization and technological innovations in reducing the shadow economy might also be examined to induce modern policy solutions. The effect of shadow economies could also be compared in regions with varying institutional quality, 'governance' (monopoly of violence) and economic development. Further research could also assess how specific policy interventions, such as tax incentives or more restrictive enforcement mechanisms, can soften the damaging impact of the shadow economy on financial systems. Further research in these areas will enable policy makers to obtain a full idea of how to make the size of the shadow economy smaller, safeguard financial system stability, and pursue a more inclusive and sustainable economic structure.

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APPENDIX

Appendix A. Comparative analysis of shadow economy, economic indicators, and financial stability (2019–2023)

Country	Year	Tinisation (%)	GDP Growth (%)	Inflation (%)	Interest Rate (%)	Financial Stability Index (FSI)
Ukraine	2019	1,5	3,2	7	10	75
Ukraine	2020	1,8	-4	8,5	9	62
Ukraine	2021	2	2,1	9,1	9,5	67
Ukraine	2022	2,2	-5	11	11	58
Ukraine	2023	2,5	3	12	10,5	64
Poland	2019	0,3	4,5	2,2	1,5	83
Poland	2020	0,4	-2,7	3	0,8	78
Poland	2021	0,5	5,9	4,5	1,2	85
Poland	2022	0,6	3,7	8	2,8	80
Poland	2023	0,7	2,9	6,5	3	82
USA	2019	0,1	2,9	1,8	2	90
USA	2020	0,2	-3,5	1,2	0,25	86
USA	2021	0,3	5,7	5	0,5	92
USA	2022	0,4	2,1	8	4	85
USA	2023	0,5	1,9	6	5,25	88
Canada	2019	0,2	1,9	2	1,5	88
Canada	2020	0,3	-5,4	0,7	0,25	82
Canada	2021	0,4	4,5	3,1	0,5	87
Canada	2022	0,5	3,2	6,8	4	84
Canada	2023	0,6	1,7	6,5	5	85
Brazil	2019	3,5	1,1	4,2	6	70
Brazil	2020	3,8	-4,1	3,2	2	65
Brazil	2021	4	4,6	8,3	6,5	72
Brazil	2022	4,2	3	9	13,75	68
Brazil	2023	4,5	2,3	5,8	12	70
Argentina	2019	2,5	-2,2	53,8	65	55
Argentina	2020	2,8	-9,9	36,1	38	48
Argentina	2021	3	10,4	50,9	40	52
Argentina	2022	3,2	4,6	94,8	75	42
Argentina	2023	3,5	2,5	98,8	90	40
China	2019	0,5	6,1	2,9	4	91
China	2020	0,6	2,3	2,4	3,85	88
China	2021	0,7	8,1	1,8	3,5	94
China	2022	0,8	3	2	3,65	89
China	2023	0,9	4,5	1,8	4	91
India	2019	1	4	3,7	5,15	80
India	2020	1,2	-7,3	6,2	4	75
India	2021	1,5	8,7	5,1	4,25	83
India	2022	1,7	6,7	6,9	5,4	81
India	2023	1,9	5,5	4,7	6	82

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