Financial and Economic Sustainability
FINECS ISSN-2181-1636 Vol. 6, Issue 2, July, 2026
https://finecs.kiut.uz



REGRESSIVITY OF THE TAX BURDEN STRUCTURE AND ITS IMPACT ON THE SHADOW ECONOMY: THEORETICAL FOUNDATIONS AND ANALYSIS OF INTERNATIONAL EXPERIENCE

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https://doi.org/10.5281/zenodo.23384183

Abstract. This article provides a theoretical and comparative analysis of the regressivity of the tax burden structure and its impact on the shadow economy. Using data from 152 countries, the study examines the relationship between the tax burden, its structural composition, and the size of the shadow economy across regions and income groups. The findings indicate that, rather than the overall level of the tax burden, its structural composition, particularly a high share of indirect taxes and insufficient progressivity of direct taxation, intensifies the regressivity of the tax system and contributes to the expansion of the shadow economy. The results suggest that optimizing the structure of the tax burden, ensuring an appropriate balance between direct and indirect taxation, and enhancing the social equity of the tax system are important prerequisites for reducing the size of the shadow economy.

Keywords: *shadow economy, tax burden structure, tax regressivity, direct taxation, indirect taxation, tax incidence, tax equity, informal economy.*

JEL Classification: H21, H22, H26, O17

1. Introduction

The tax system is an important institutional mechanism that not only ensures the fiscal sustainability of a state but also influences economic growth, income distribution, and social equity. Accordingly, contemporary economic theories increasingly focus not only on the overall level of the tax burden but also on its structural composition and the way it is distributed among economic agents. In improving the institutional framework of tax policy, determining an optimal level of taxation is therefore accompanied by the equally important task of ensuring an equitable and economically incentive-compatible distribution of the tax burden.

Existing research indicates that an effective reduction of the shadow economy depends not only on the quantitative level of the tax burden but also on its structural composition, particularly the balance between direct and indirect taxation. The respective shares of these taxes in total tax revenues shape the degree of social equity within the tax system and determine whether taxation exhibits progressive or regressive characteristics, while also directly influencing taxpayers' economic behavior. In particular, a high reliance on indirect taxation combined with insufficient progressivity in direct taxation may increase the regressivity of the overall tax burden, imposing a disproportionately heavier burden on low-income households and low-profitability businesses. As a result, incentives for economic agents to operate within the formal sector may weaken, thereby increasing the likelihood of their participation in the shadow economy.

From this perspective, providing a theoretical explanation of how regressivity in the tax burden structure affects the shadow economy and examining its economic consequences through cross-country experience are of considerable scientific and practical importance. Such an analysis can contribute to identifying priority areas for improving tax policy and developing more effective approaches to reducing the scale of the shadow economy.

This article examines the theoretical mechanisms through which the regressivity of the tax burden structure may influence the shadow economy and systematizes the principal approaches to optimizing the composition of the tax burden based on international experience. It further explores the potential for reducing the shadow economy by enhancing both the social equity and economic efficiency of the tax system.

2. Literature Review

In assessing the economic efficiency and social equity of a tax system, not only the overall level of the tax burden but also its structural composition is of considerable importance. According to modern public finance theory, the effects of taxation on economic growth, income distribution, and the behavior of economic agents are determined by the type and rate of taxes, as well as by how the tax burden is distributed between households and businesses (Atkinson & Stiglitz, 1980; Musgrave & Musgrave, 1989). Accordingly, the progressive or regressive nature of a tax system is widely regarded in the economic literature as one of the key criteria for assessing the effectiveness of government redistribution policies.

Economic theory suggests that direct taxes, particularly progressive income taxation, are based on the ability-to-pay principle, whereby a relatively greater tax burden is imposed on higher-income individuals. As a result, income inequality can be reduced and greater social equity can be achieved (Musgrave & Musgrave, 1989; Piketty & Saez, 2007). By contrast, indirect taxes, because they are generally imposed on consumption without directly accounting for taxpayers' income levels, may absorb a larger proportion of the income of low-income households and thereby contribute to the regressivity of the tax burden (Bird & Zolt, 2005; Keen, 2013). This may, particularly in developing countries, exacerbate social inequality and weaken public confidence in the tax system.

One of the most widely used approaches to assessing the progressivity or regressivity of taxation is the Kakwani Index. Developed by Kakwani (1977), the index measures the redistributive characteristics of a tax system by comparing the concentration of tax payments with the distribution of pre-tax income. A positive value of the index indicates progressive taxation, whereas a negative value indicates regressive taxation. Figure 1 illustrates the conceptual framework underlying this approach, showing how changes in the relative shares of direct and indirect taxes within the overall tax burden may affect income redistribution through the relationship between the Lorenz curve and the tax concentration curve. In particular, when an appropriate balance between direct and indirect taxation is maintained, the concentration curve for total taxes is positioned closer to the Lorenz curve, reflecting a more balanced distribution of the tax burden and greater redistributive effectiveness of the tax system (Panel A). Conversely, an increase in the share of indirect taxes within the tax burden shifts the tax concentration curve away from the income distribution curve in a manner associated with greater regressivity (Panel B). Consequently, a relatively larger tax burden falls on lower-income groups, reducing the overall equity of tax burden distribution.

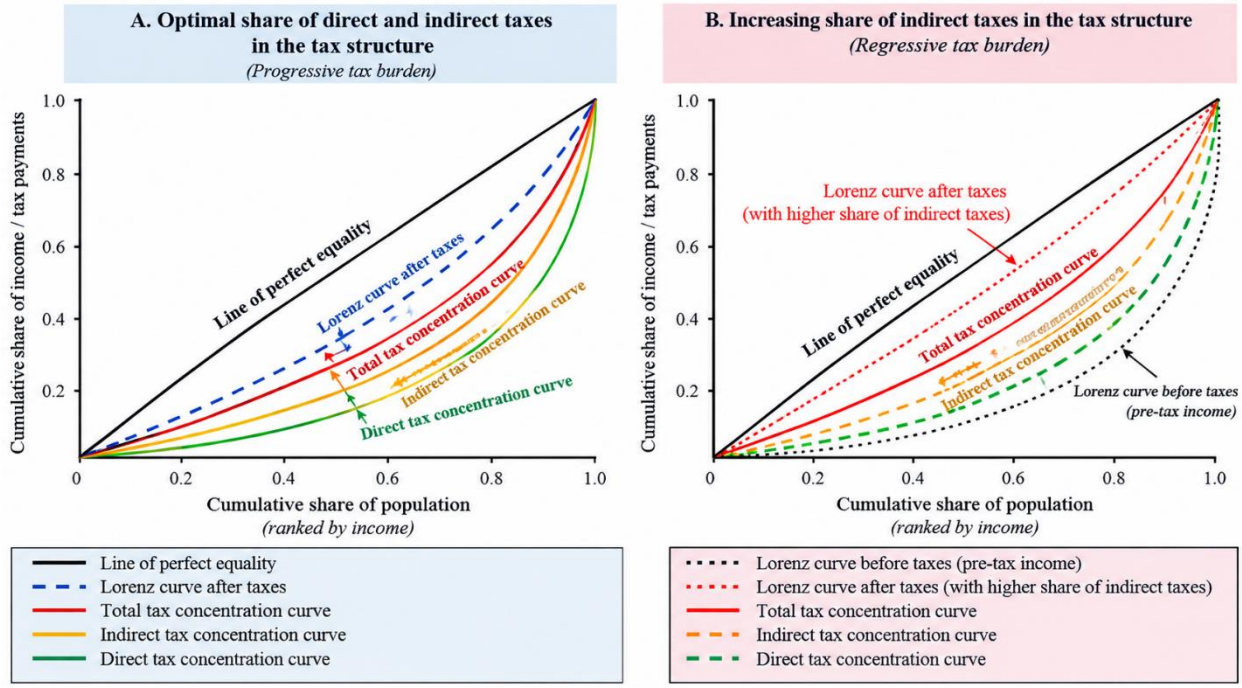


Figure 1. Progressive and Regressive Tax Burden Distribution: Lorenz and Tax Concentration Curves[1]

Recent studies have increasingly emphasized that the structural composition of the tax burden directly affects not only income distribution but also the size of the shadow economy. In particular, Schneider and Enste (2000) and Schneider (2012) argue that high indirect taxation and inefficient tax administration strengthen economic agents' incentives to shift from the formal to the informal sector. According to these authors, an increasing

[1] Kakwani, N. C. (1977). Measurement of tax progressivity: An international comparison. *Economica, 44*(175), 71–80. https://doi.org/10.2307/2553746

tax burden and its inequitable distribution contribute to tax evasion, informal employment, and the expansion of unreported economic activities. These effects are particularly pronounced in countries characterized by weak institutional environments.

Bird and Zolt (2005) also emphasize the limited redistributive capacity of the personal income tax in developing countries, demonstrating that a substantial share of government revenue in these economies is generated through indirect taxation. Consequently, the tax burden falls disproportionately on lower-income groups, potentially creating incentives for informal economic activity. A similar perspective is reflected in OECD (2011) research, which indicates that excessively high levels of consumption taxation may adversely affect labor markets, consumption activity, and the business environment.

Martinez-Vazquez and McNab (2000), in their analysis of tax reforms implemented in transition economies, demonstrate that an equitable distribution of the tax burden is an important condition for improving tax compliance and increasing the share of economic activity conducted within the formal sector. Subsequent studies have likewise identified the quality of public institutions, the effectiveness of tax administration, and the progressivity of the tax system as important institutional determinants of the size of the shadow economy (Torgler & Schneider, 2009; Medina & Schneider, 2019).

Thus, the existing theoretical and empirical literature suggests that the structural composition of the tax burden may be more important than its aggregate level in shaping economic agents' attitudes toward taxation and their incentives to participate in the shadow economy. However, most previous studies have primarily focused on the overall tax burden or the effects of individual types of taxes, while the regressivity of the tax burden structure and the mechanisms through which it may affect the shadow economy have not been examined in a sufficiently comprehensive manner. This article seeks to address this research gap by providing a theoretical foundation for the regressive characteristics of the tax burden structure and assessing their relationship with the shadow economy based on international evidence.

3. Methodology

In this study, a combination of comparative analysis, statistical generalization, grouping, correlation analysis, and scientific abstraction methods was employed to assess the regressivity of the tax burden structure and its impact on the shadow economy.

The theoretical framework of the study is based on Optimal Tax Theory, the ability-to-pay principle, Tax Incidence Theory, and Institutional Economics. Drawing on these theoretical approaches, a conceptual framework was developed to explain how the structural composition of the tax burden influences economic agents' attitudes toward taxation and their incentives to participate in the shadow economy.

The empirical analysis was conducted using data from 152 countries. The countries were first classified by geographical region—Europe, the Americas, Asia and the Pacific, the Middle East and Central Asia, and Africa—and subsequently grouped by income level according to the World Bank classification: High-Income Countries (HIC), Upper-Middle-Income Countries (UMC), Lower-Middle-Income Countries (LMC), and Low-Income

Countries (LIC). This approach enabled a comparative assessment of the relationship between the tax burden structure and the shadow economy across different institutional environments and levels of economic development.

The analysis employed country-level indicators of the overall tax burden, direct taxes, indirect taxes, social security contributions, other taxes, and the size of the shadow economy. To assess the degree of regressivity in the tax burden structure, both the ratio and the difference between the shares of indirect and direct taxes were used as key analytical indicators. In addition, countries were classified into four groups based on combinations of these indicators, allowing for a comparative analysis of the relationship between the structure of the tax burden and the size of the shadow economy.

Descriptive statistics, comparative analysis, and graphical visualization techniques were applied, and the findings were interpreted in relation to economic theory and the conclusions of existing empirical studies. This methodological framework made it possible to test the research hypothesis that the structural composition and regressive characteristics of the tax burden, rather than its absolute level alone, play an important role in determining the size of the shadow economy.

4. Analysis and discussion of results

The cross-country comparative analysis confirms that, although the overall level of the tax burden is an important factor influencing the size of the shadow economy, its impact is primarily determined by the structural composition of the tax burden, the effectiveness of public institutions, and the country's level of economic development. In particular, in developed countries, a relatively high tax burden does not necessarily translate into excessive costs for economic agents due to a strong institutional environment, effective public administration, and well-developed social protection systems. By contrast, in countries with weaker institutional environments, even a relatively low overall tax burden may create incentives for participation in the shadow economy when its structure is regressive.

To assess these patterns, indicators of the overall tax burden, its structural composition, and the size of the shadow economy for 152 countries were comparatively analyzed, first across geographical regions and subsequently across income groups.

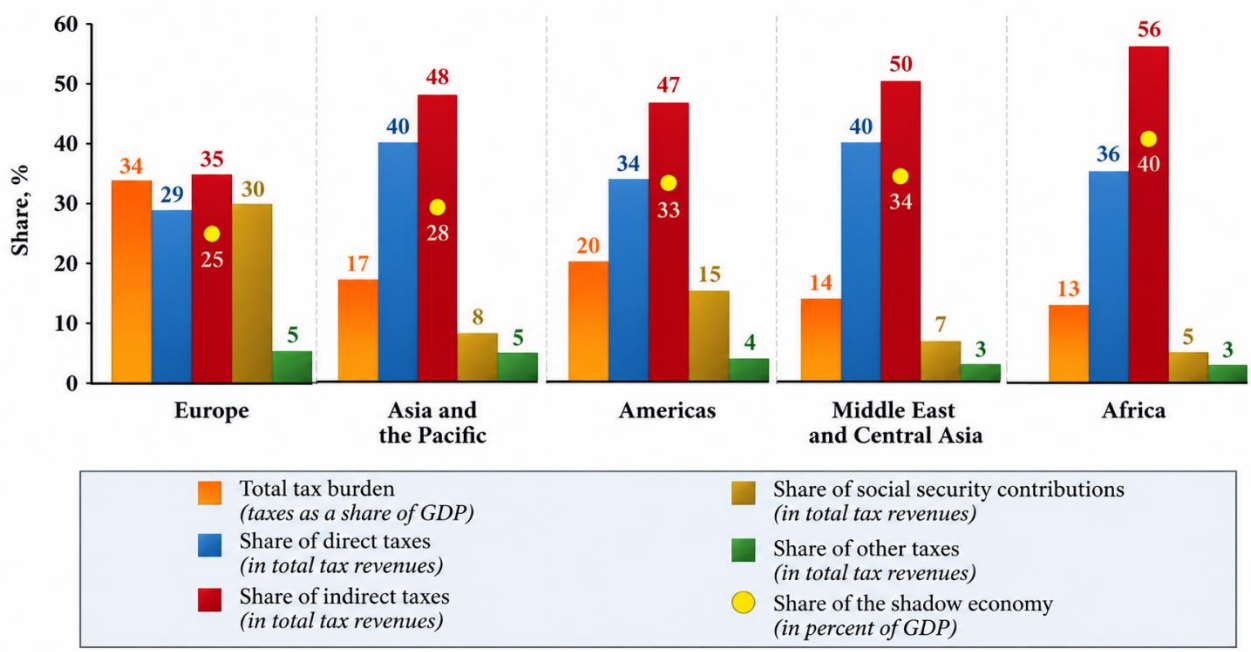


Figure 2. Comparative Analysis of the Shadow Economy and Tax Burden Structure across Countries by Region[2]

As illustrated in the figure above, the tax systems of European countries exhibit distinct structural characteristics compared with those of other regions. In Europe, the overall tax burden is relatively high, at 34%, while the share of the shadow economy is the lowest among the regions analyzed, at 25%. This outcome can primarily be attributed to the relatively balanced composition of the tax burden, with direct and indirect taxes accounting for 29% and 35%, respectively, as well as the substantial share of social security contributions (30%). Such a structure contributes to a relatively equitable distribution of the tax burden in accordance with the ability-to-pay principle, thereby helping to preserve the economic incentives for operating within the formal economy.

By contrast, an opposite pattern is observed in the other regions. In African countries, for example, the overall tax burden is only 13%, whereas the shadow economy accounts for approximately 40% of economic activity. A similar pattern is observed in the Middle East and Central Asia, where the corresponding figures are 14% and 34%, respectively, as well as in the Americas (20% and 33%) and Asia and the Pacific (17% and 28%). In these regions, the relatively high share of indirect taxes, ranging from 47% to 56%, tends to reinforce the regressive characteristics of the tax burden and may increase the relative cost of formal economic activity for low-income households and small businesses. Consequently, participation in informal economic activities may become comparatively more economically attractive.

The analysis by income group further supports these findings (see Figure 3). In high-income countries (HICs), the shadow economy accounts for the lowest share, at 21%,

[2] *Compiled by the author based on data from World Bank Open Data (URL: https://data.worldbank.org/) and World Economics' Informal Economy Size database (URL: https://www.worldeconomics.com/Informal-Economy/).*

despite an overall tax burden of 31%. In these countries, the share of direct taxes (36%) exceeds that of indirect taxes (34%), while social security contributions account for 23%. This tax structure is consistent with a comparatively stronger redistributive role of the fiscal system and suggests that the composition of taxation, rather than the overall tax burden alone, is an important factor associated with differences in the size of the shadow economy across income groups.

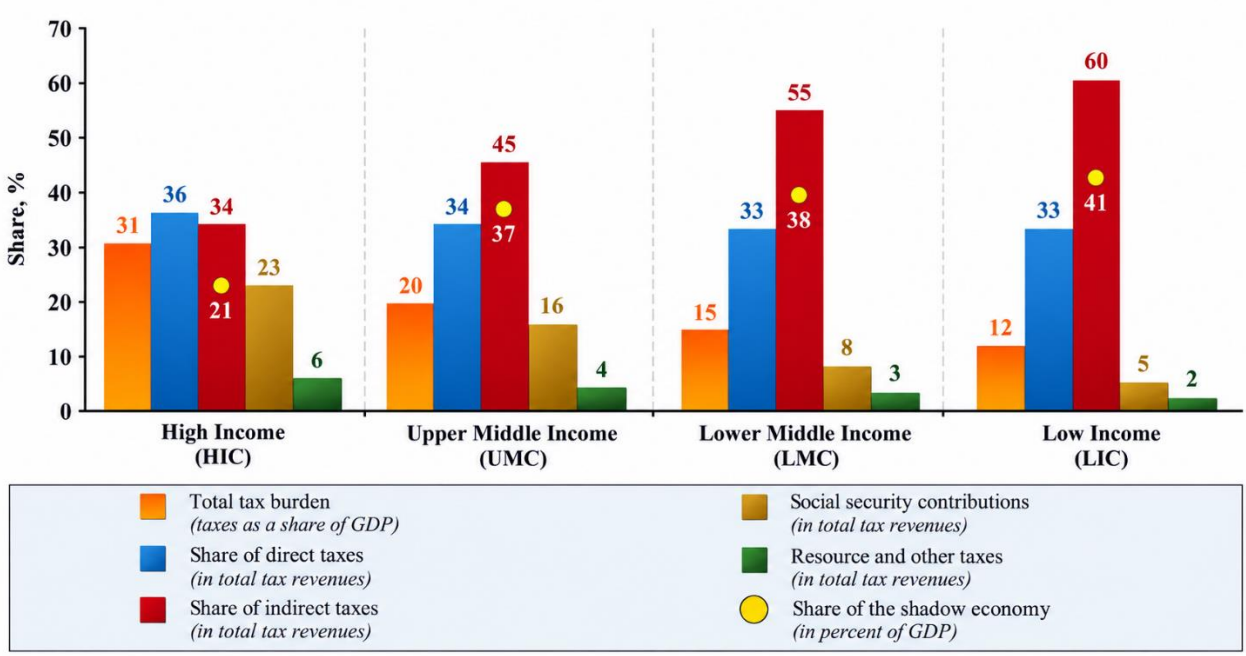


Figure 3. Comparative Analysis of the Shadow Economy and Tax Burden Structure Across Countries by Income Group[3]

As income levels decline, the structural composition of the tax burden also changes considerably. In upper-middle-income countries, indirect taxes account for 45% of the tax structure, increasing to 55% in lower-middle-income countries and reaching 60% in low-income countries. At the same time, the share of social security contributions declines from 23% to 5%. This pattern is associated with a weakening of the social protection function of the state and greater regressivity of the tax burden, potentially strengthening economic agents' incentives to shift from the formal to the informal sector. Consequently, despite the declining overall tax burden across income groups, the share of the shadow economy increases consistently, from 21% in high-income countries to 41% in low-income countries.

The relationship between the composition of the tax burden and the shadow economy is also clearly observable at the country level (see Figure 4). The analysis shows that, among the 152 countries, 55 countries (36%) are characterized by both a relatively low share of indirect taxes and a relatively small shadow economy. Conversely, in 51 countries (34%), a relatively high share of indirect taxes coincides with a relatively

[3] *Compiled by the author based on data from World Bank Open Data (URL: https://data.worldbank.org/) and World Economics' Informal Economy Size database (URL: https://www.worldeconomics.com/Informal-Economy/).*

large shadow economy. This pattern indicates a positive association between the share of indirect taxation and the size of the shadow economy.

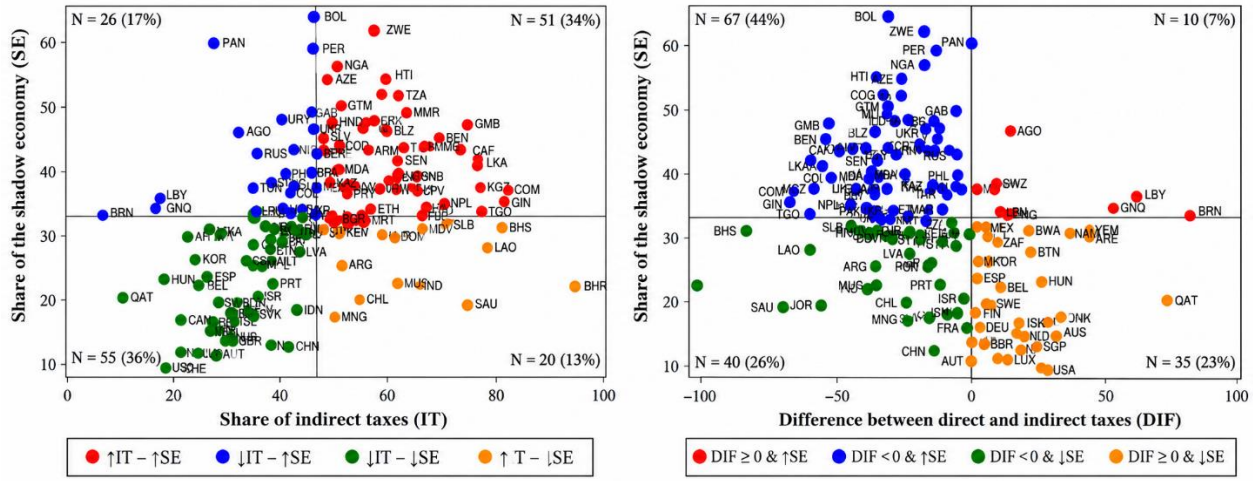


Figure 4. Analysis of the Relationship Between the Shadow Economy and Indirect Taxes Across Countries[4]

This relationship becomes even more evident when examined through the difference between the shares of direct and indirect taxes. In particular, among 67 countries (44%) where the share of indirect taxes exceeds that of direct taxes, the size of the shadow economy is also relatively high. By contrast, among countries where direct taxes predominate, this pattern is observed in only 35 countries (23%). These findings suggest that the structural composition of the tax burden, particularly excessive reliance on indirect taxation, constitutes an important institutional factor associated with a larger shadow economy.

The findings provide empirical support for the theoretical arguments developed earlier in this study. In particular, they indicate that the distributional structure of the tax burden may have a stronger relationship with the expansion of the shadow economy than the absolute level of taxation itself. Excessive reliance on indirect taxation increases the regressivity of the tax system and raises the relative cost of operating in the formal sector for low-income households and low-profitability small businesses. This, in turn, may strengthen incentives for tax evasion, informal employment arrangements, and the transition of economic activity into the shadow economy.

Accordingly, tax policy aimed at reducing the shadow economy should focus not merely on lowering the overall tax burden, but rather on optimizing its structural composition. In this context, maintaining an appropriate balance between direct and indirect taxation, reducing the regressivity of the tax burden, strengthening social protection mechanisms, and alleviating the relative tax burden on low-income households and small businesses represent important policy priorities for reducing the size of the shadow economy. Such measures may not only enhance the equity and economic

[4] *Compiled by the author based on data from World Bank Open Data (URL: https://data.worldbank.org/) and World Economics' Informal Economy Size database (URL: https://www.worldeconomics.com/Informal-Economy/).*

efficiency of the tax system but also strengthen economic agents' incentives to operate within the formal sector.

5. Conclusions and Policy Recommendations

The findings of this study confirm that the structural composition and degree of regressivity of the tax burden have a stronger influence on the shadow economy than the overall level of the tax burden itself. In particular, a high reliance on indirect taxation combined with insufficient progressivity of direct taxes imposes a disproportionately greater tax burden on low-income households and low-profitability businesses, thereby weakening their incentives to operate within the formal sector. Consequently, the economic incentives for agents to shift to, or remain within, the informal economy become stronger.

The comparative analysis of 152 countries provides further support for these theoretical findings. In particular, despite relatively high overall tax burdens in high-income countries, the larger share of direct taxation, stronger social redistribution mechanisms, and more developed institutional environments are associated with comparatively smaller shadow economies. By contrast, in low- and middle-income countries, greater reliance on indirect taxation tends to reinforce the regressivity of the tax system and is associated with a larger shadow economy.

Accordingly, policies aimed at reducing the shadow economy should prioritize optimizing the structural composition of the tax burden rather than merely reducing its overall level. This requires maintaining an appropriate balance between direct and indirect taxation, strengthening the redistributive function of direct taxes, gradually reducing excessive reliance on indirect taxation, and introducing mechanisms to mitigate the regressive effects of taxation on low-income households and small businesses. Such measures can enhance both the equity and economic efficiency of the tax system while providing an important institutional foundation for reducing the size of the shadow economy.

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