ORIGINAL ARTICLE

How large is Vietnam′s informal economy?

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Abstract

The purpose of this article is to estimate the size of the informal economy in Vietnam, describe its development from 1995 to 2015, and assess the country′s potential tax loss from this activity. The MIMIC model indicates that the informal economy accounts for between 15 per cent and 27 per cent of GDP. The informal economy has grown sharply in Vietnam since 2007, while its size has decreased in other comparable nations. Potential tax revenue lost annually amounts to between 3.3 per cent and 5 per cent of gross domestic product.

KEYWORDS

informal economy, MIMIC model, tax potential. Vietnam

JEL CLASSIFICATION

C39; H26; O17

1 | INTRODUCTION

The informal economy has long been an important feature of countries worldwide. It exists in parallel with the official economy and impacts differently depending on the structure of each economy and its government′s socioeconomic policies. Though it plays a positive role in mitigating poverty, and provides jobs and income for some disadvantaged groups, especially in developing economies, the informal sector poses potential risks in the longer term. Apart from reducing the effectiveness of policymaking, human resource allocation[1] and the reliability of official statistics, it makes tax collection more difficult and less equitable, and may reduce productivity and international competitiveness.[2] According to Gangadha, Duc, Engelschalk, and Tuan (2011), an informal economy within the range of 17.6–35.7 per cent of GDP means a loss of tax collection of between 3.5 per cent and 6.1 per cent of GDP. Thus many countries are trying to control and reduce the size of this sector.

Studies of the informal economy have been conducted in many countries, but this sector and its effects on tax collection and the national economy as a whole have received little attention in Vietnam. My analysis attempts to remedy this deficiency.

2 | THE ACADEMIC LITERATURE

Although many studies of the informal economy have been undertaken, a comprehensive definition of it is still missing. Each nation has its own terminology, approaches, classification, measurement, and assessment of this sector. Most definitions assume that the informal economy includes all economic activities that are not included in GDP and are difficult to measure (Feige, 1996). One of the best is offered by Smith (1994, p. 4), who defined the informal sector as "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP". In this article I follow Smith's definition.

2.1 | Tax obligations and social welfare burdens

Many studies indicate that the burdens of tax and social welfare systems are key causes of the informal economy's growth (Alm, Martinez-Vazquez, & Torgler, 2006; Alm & Torgler, 2006; Dell'Anno, 2003; Giles, 1999; Schneider, 2010; Schneider & Enste, 2000, 2002; Tanzi, 1980; Thomas, 1992). Schneider and Enste (2002) point out that tax and welfare policies have marked effects on gross and net incomes. The greater the costs imposed, the lower is the net income received by workers. This is a matter not only of high tax rates but also of transaction costs relating to tax, administrative procedures and other compliance costs. The bigger the difference between the cost to the employer and the income received by the worker, the greater is the motivation for joining the informal economy – particularly where monitoring and enforcement are weak.

2.2 | Legal systems, institutions and government

Apart from the effect of tax burdens, inflexible and prolix regulations also lead to an increasing number of workers and businesses joining the unofficial sector. Red tape and complicated procedures are a major problem in the official economy, and the costs these impose are typically passed on to workers in the form of lower wages (Schneider & Enste, 2000).

Poor quality of institutions is also an important factor leading to the growth of the informal economy. A state where the rule of law holds, property is secure, and contract execution is guaranteed promotes trust. This in turn encourages participation in the formal economy. In contrast, weak institutions, widespread corruption and poor government accountability and transparency are key factors driving businesses and individuals into the unofficial sector. Rapid expansion of the informal economy is thus a marker of institutional failure (Buehn & Schneider, 2012; Johnson, Kaufmann, & Shleifer, 1997; Johnson, Kaufmann, & Zoido-Lobaton, 1998).

2.3 | Downturn in the official economy

Another factor boosting the informal sector is a downturn in the official economy (Bajada, 2007; Maurin, Sookram, & Watson, 2006; Schneider, 2010; Schneider & Enste, 2002). Economic crises in developing countries usually generate high rates of unemployment, inflation and bad debt. In

many cases, businesses declare bankruptcy and workers lose their jobs. Part of the inevitable fallout is increased participation in the informal economy. The inescapable consequences of these economic pressures encourage individuals and businesses to participate in the informal economy. A study by Romero (2010) indicates that a shortage of jobs in the official sector as a consequence of economic downturn and population pressures makes the informal sector an alternative source of livelihood. Once they enter the informal economy, workers are highly unlikely to return to the official economy (Schneider & Klinglmair, 2004).

2.4 | Other factors

Listing all possible causes of the growth of the informal economy is always a challenge for researchers because there are so many unobservable factors. Some objective causes such as business customs, consumption patterns, public attitudes towards authorities, a law-abiding culture, tax morality, and so forth all have effects. One problem arises from poor education and inability to handle the complexity of officialdom. For example, self-employed persons running their own small businesses are unaware of regulations, and stay in the unofficial sphere to avoid being intimidated or controlled by competent authorities.

## 3 | MEASURING THE SIZE OF THE INFORMAL ECONOMY

As the informal economy involves undeclared and unobserved economic activities, researchers agree that its size can be estimated only indirectly and inaccurately. Researchers have adopted three broad approaches to measuring the informal economy (Georgiou, 2007): the 'micro' approach, using direct investigation, surveys and tax audits; the 'indirect' approach, where inferences are made about the scale of informal activity through, for example, energy consumption or the demand for currency; and the modelling approach, which I use here.

My approach is based on the Multiple Indicators Multiple Causes (MIMIC) model consisting of two parts: the measurement model and the structural equation model (SEM) (see Appendix A). The measurement model is used for linking observed indicators to unobserved ones; the SEM is used for determining the causal relations amongst these indicators. In this case, the size of the informal economy is an unobservable variable through time (latent) and measured by using indicator variables based on the variables causing the presence of the informal economy. Therefore, the size of the informal economy is evaluated by estimating and evaluating the relations among variables in the MIMIC model.
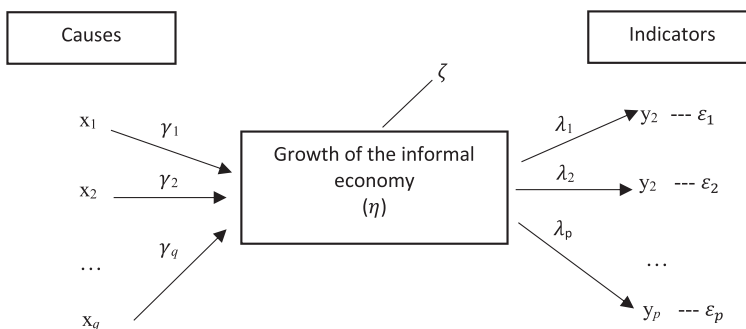
FIGURE 1 The MIMIC informal economy.
Source: Schneider and Enste (2000).
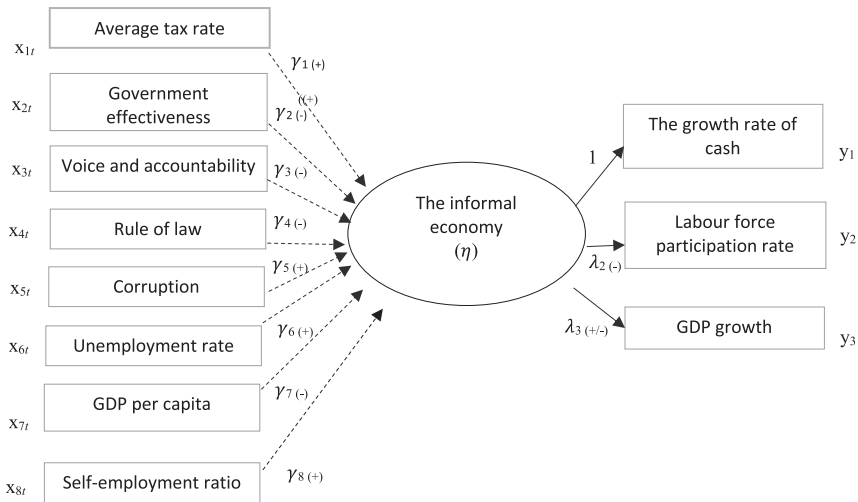
FIGURE 2 The informal economy's size measurement methodology.

The MIMIC model is based on the latent and observation variables, as shown in Figure 1.

MIMIC is considered the most comprehensive approach because many different factors affecting the informal economy are taken into consideration. However, the main limitation of this approach is that it requires large and complete data sets, which makes it difficult to apply in nations with limited data. More importantly, the structural equation model needs to be stable to ensure the reliable estimation of the informal economy.

4 | CAUSES AND INDICATORS

As Figure 1 shows, the construction of a MIMIC model needs two groups of variables: 'causes' (factors which influence the size of the informal sector) and 'indicators' (which show the effects of its presence).

4.1 | Causes

4.1.1 | Tax burdens and social contributions

It is not easy to determine a priori the burdens of tax and social contribution because these systems differ from nation to nation. Based on a reading of the studies by Tanzi (1980, 1983), Thomas (1992), Schneider and Enste (2000, 2002), Schneider and Klinglmair (2004), Schneider and Torgler (2007), Schneider, Buehn, and Montenegro (2010), Johnson et al. (1997) and Johnson et al. (1998), I propose to use the average tax rate, that is, the percentage of tax revenues in GDP.

Hypothesis H1. *Heavy tax burdens lead to the expansion of the informal economy.*

4.1.2 | Institutions, legal systems and government

Studies by Hirschman (1970), Schneider and Enste (2000), Johnson et al. (1998) and Enste (2010) suggest that complicated legal systems, red tape procedures and corruption are the

reasons why individuals and businesses participate in the informal sector. In order to measure these factors, I refer to the Worldwide Governance Indicators (WGI), the World Bank's yearly compilation of the perceptions of the public and enterprises, capturing many aspects of institutions, legal system and government (World Bank, 2018). WGI capture six key dimensions, of which the three following indicators are used in the model:

- *Government Effectiveness:* measures the quality of public and civil services provided by the government, the quality of policymaking and execution, and government's reliability for commitment to policies.
- *Voice and Accountability*: measures perception of public participation in government's selection and policymaking, expression of the public point of view, and government's accountability to the people.
- *Rule of Law*: measures inhabitants' and businesses' perception of the reliability of the legal system – law-abiding behaviour, especially quality of contract execution, the right to own property, quality of judges and public security.

These indices are within the range −2.5 to 2.5, where high scores correspond to good results. In addition, the following index is used to measure corruption:

- *Corruption:* measured through Corruption Perceptions Index (Transparency International, 2018). This index measures the perception of the degree of public power overuse for individual benefits. It uses a scale of 0 to 10.[3] High scores mean greater transparency and less corruption.

> **Hypothesis H2.** *A good legal system and institutions, and less corruption, reduces the size of the informal economy.*

4.1.3 | Decline in the official economy

As previously mentioned, a downturn in the official economy will tend to result in increased inflation, unemployment, and business bankruptcies. These will motivate individuals to participate in the informal economy. In order to measure the decline of the official economy, based on the studies by Schneider and Torgler (2007), Schneider (2010) and Dell'Anno (2003), my model uses two variables representing the health of the official economy:

- The Unemployment Rate
- GDP Per Capita

> **Hypothesis H3.** *As the official economy declines, GDP per capita falls and unemployment rises: this will contribute to an increase in the size of the informal economy.*

4.1.4 | Practice and customs

I use the rate of self-employment as a control variable for business practice to represent this cause group. This variable was also used in previous studies such as Schneider and Torgler (2007), Schneider (2010) and Dell'Anno (2003).

- *Self-employment Ratio:* percentage of self-employed persons in the total labor force.

> **Hypothesis H4.** *A country with a higher ratio of self-employment will have a larger informal sector.*

4.2 | Indicator groups

Since it is impossible for the informal economy to be measured directly, the best indicators are used. Following previous studies (Loayza, 1997; Dell'Anno, 2003; Bajada & Schneider, 2005; Schneider and Enste (2000) and Schneider (2010), common indicators are as follows:

- *The growth rate of cash:* transactions in the informal economy are mainly done in cash to avoid government control. When the unofficial economy expands, the demand for cash will increase
- *Labour force participation rate:* Schneider and Enste (2000) found a tight relationship between the size of the informal economy and the labour force. A low measured labour force participation rate suggests significant working in the underground economy.
- *Gross domestic product growth*: empirical studies show a relationship between informal economy growth and GDP growth. However, the effects of the informal economy on the official economy are not clear. The relation is positive in some studies while it is negative in some others (see Table A1).

The MIMIC model consists of eight cause variables and three indicator variables presented in Figure 2 and thus, the structural equation model is then:

$$\eta = \gamma_1 X_{1t} + \gamma_2 X_{2t} + \gamma_3 X_{3t} + \gamma_4 X_{4t} + \gamma_5 X_{5t} + \gamma_6 X_{6t} + \gamma_7 X_{7t} + \gamma_8 X_{8t} + \zeta. \tag{1}$$

5 | DATA

Vietnam's longitudinal data do not meet the minimum requirements for an acceptable sample. So I combine data from Vietnam and data from certain Asian countries with annual GDP per capita in the range of USD1,000–USD10,000 – nations with similar levels of economic development to Vietnam's. The study sample covers ten countries: Vietnam, Thailand, Indonesia, Philippines, Cambodia, Laos, India, Malaysia, Sri Lanka and China. There are 210 observations in total, from 1995 to 2015. The data used here are secondary data collected from the World Bank and International Monetary Fund to ensure accuracy and consistency. Table 1 present a summary of statistics for cause variables and indicator variables.

6 | RESULTS

Once the structural equation model is used to measure the size of the informal economy, the estimated coefficients are presented in Table 2.

After estimation of the MIMIC model, statistical tests of the model were conducted. The results show that the model complies with and satisfies conditions of the SEM's stability. Estimated coefficients all have high statistical significance. However, an important result is that

TABLE 1 Statistics of the variables used in the study model

Variable	Average	Minimum value	Maximum value	Standard deviation	Kurtosis	Skewness
Tax burden (%)	12.77	4.60	22.40	3.69	0.04	0.27
Government effectiveness (index)	−0.13	−1.22	1.24	0.54	0.35	0.54
Rule of law (index)	−0.31	−1.25	0.64	0.51	−0.94	0.07
Voice and accountability (index)	−0.59	−1.82	0.51	0.69	−1.27	−0.11
Corruption (index)	3.07	1.70	5.30	0.85	0.35	0.83
Unemployment rate (%)	4.03	0.10	12.20	2.82	0.31	1.03
Self-employment rate (%)	64.20	23.30	92.00	18.80	−0.42	−0.61
GDP per capita (logarithm) (%)	8.46	6.69	10.20	0.77	−0.53	0.03
The growth rate of cash (%)	14.90	−14.80	99.07	13.87	8.74	2.17
Labour force participation rate (%)	72.60	56.30	85.00	9.19	−1.53	−0.17
GDP growth (%)	6.06	−13.30	14.20	3.16	8.94	−1.93

Source: Author calculations.

TABLE 2 Regression results of the MIMIC equation

Cause variable				Indicator variable			
Tax burdens	0.12	(1.92)	*	The growth rate of cash	1		
Government effectiveness	2.85	(2.83)	***	Labor force participation rate	1.59	(5.30)	***
Voice and accountability	−2.99	(−4.63)	***	GDP growth	0.19	(3.79)	***
Rule of law	−4.04	(−3.75)	***				
Corruption	−1.18	(−2.19)	**				
Unemployment rate	−0.67	(−4.77)	***				
GDP per capita	−1.13	(−2.24)	***				
Self-employment ratio	0.04	(5.36)	***				
Statistical tests							
RMSA (*p*-value)				0.086 (0.21)			
χ^2/df (*p*-value)				2.54 (0.00)			
Degrees of freedom				15			
Number of observations				210			

(*), (**) and (***) are of 10%, 5% and 1% significance respectively.

Full details of statistical tests of the SEM can be obtained from the author.

the unemployment rate and labour force participation rate have an inverse relation with the informal economy, which is the opposite of the initial expectation. This means that when the rate of unemployment falls (that is, more jobs are provided in the economy), the informal economy expands. This interesting finding might be explained by workers in developing countries tending to work more hours for further earnings. Although they have jobs in the official economy, they still undertake extra work in the unofficial sector. That is why, if they are

TABLE 3 Size of the informal economy in 2000 (% GDP)

Nation	MIMIC approach	Monetary demand approach	Average value
Vietnam	15.6	27.9	21.7
Cambodia	50.1	–	50.1
Indonesia	19.4	31.6	25.5
Lao	30.6	–	30.6
Malaysia	31.1	27.9	29.5
Thailand	52.6	26.3	39.4
Philippines	43.3	27.4	35.3
India	23.1	21.1	22.1
Sri Lanka	44.6	32.1	38.3
China	13.1	21.0	17.1

Source: MIMIC approach: Schneider et al. (2010); monetary demand approach: Alm and Embaye (2013).

unemployed, they still have jobs to do. This phenomenon is often found in employment statistics in developing countries.

With the regression results, the estimated MIMIC model has the following form:

$$\tilde{\eta}_t = 0.12^* x_{1t} + 2.85^* x_{2t} - 2.99^* x_{3t} - 4.04^* x_{4t} - 1.18^* x_{5t} - 0.67^* x_{6t} - 1.13^* x_{7t} + 0.04^* x_{8t} + \zeta. \qquad (2)$$

These results give us an estimated size of the informal economy. As mentioned, this estimation must be standardised in number through a step of data standardisation using a given basic year. To ensure that the results for Vietnam and countries in the study sample are objective, the year 2000 is adopted as the basic year with the average result of two studies by Schneider et al. (2010) and Alm and Embaye (2013) (see Table 3).

Standardisation of data based on the base year selected (2000) is undertaken using the formula in equation 5 set out in Appendix A. On that assumption, to estimate the scale of the informal economy in 2015, we define the following:

We replace values x_i ($i = 1, ..., 8$) in 2000 and 2015 in equation 2 in order to estimate the size of the informal economy in Vietnam in 2015.

$$\tilde{\eta}_{2000} = 0.12^* 16.5 + 2.85^* (-0.44) - 2.99^* (-1.25) - 4.04^* (-0.34)$$
$$-1.18^* 2.5 - 0.67^* 2.3 - 1.13^* 7.65 + 0.04^* 80.3 = -4.43$$
$$\tilde{\eta}_{2015} = 0.12^* 18.2 + 2.85^* 0.08 - 2.99^* (-1.33) - 4.04^* (-0.27) - 1.18^* 3.3$$
$$-0.67^* 2.2 - 1.13^* 8.70 + 0.04^* 63.5 = -5.48$$

By replacing the above two values to the formula in equation 5 with $\eta^*_{2000} = 21.7$, we have the following result:

$$\hat{\eta}_{2015} = \frac{\tilde{\eta}_{2015}}{\tilde{\eta}_{2000}} \eta^*_{2000} = \frac{-5.48}{-4.43} * 21.7 = 26.90 \ (\%GDP).$$

Similar replacement is done for all years from 1995 to 2015 and to each nation in turn. Estimated results are shown in more detail in Table A2. The size of the informal economy (per cent

of official GDP) of Vietnam and other countries for the period 1995–2017 is shown in Figure 3 and Figure 4.

These results indicate that Vietnam's informal economy tended to increase during the period 1995–2015, especially from 2008 onwards, though it tended to decrease from 1999 to 2007. Moreover, of the ten studied countries, Vietnam is one of the three whose informal economy grows at a high rate. Every year, this sector has increased by 1.2 per cent on average, ranked only after Indonesia (3 per cent) and China (2.1 per cent). This presents many challenges that Vietnam has to face in managing and controlling the expansion of this sector. Analysis and identification of the causes of the increase in the informal economy are indeed necessary if this sector is to be controlled and reduced.

6.1 | The tax burden

The first hypothesis (that heavy tax burdens lead to the expansion of the informal economy) is supported when the tax burden has a positive relationship with the informal economy. So the tax burden, along with high social contributions, is an important factor encouraging individuals to avoid or evade tax payment. Of the ten countries studied, Vietnam has the highest average tax rate, which has tended to increase since 2000, with an average tax rate in this period of 20.25 per cent (see Figure 5). This increasing average tax rate, coupled with high tax compliance costs and
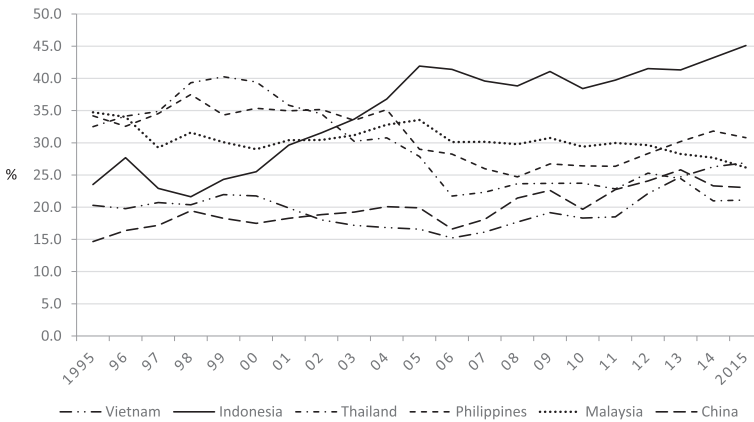
FIGURE 3 Size of the informal economy (% GDP) in selected Asian countries, 1995–2017. Source: Author's calculations.
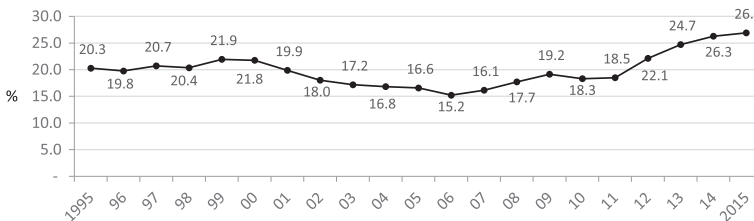
FIGURE 4 Size of the informal economy (% GDP) in Vietnam, 1995–2015. Source: Author's calculations.
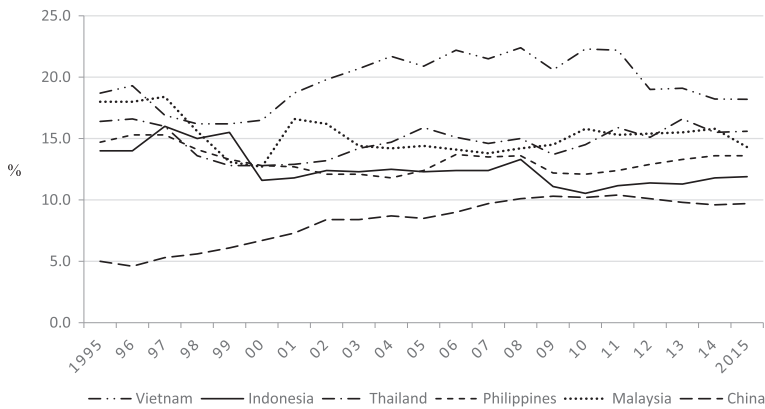
FIGURE 5 Total tax revenue, excluding social security contributions (% GDP) in selected Asian countries, 1995–2105.
Source: Collected by the author.

the law on tax in the process of reform, are clearly the causes of the expansion of the informal economy in Vietnam (see Table A3).

For developing countries, taxation is always an important source of revenue, accounting for most of it. Therefore, the growing demand for development is paired with increased demand for expenditure and, to meet these expenditures, in Vietnam tax revenue is the main source of finance. However, the current high levels of taxation and the incomplete tax system have created conditions that encourage tax evasion and tax avoidance. Enterprises and individuals choose to operate in the informal sector rather than the formal economy, in order to reduce their tax burden and other costs.

6.2 | Legal, institutional and governmental system

The second hypothesis (that a good legal system and institutions, and less corruption, reduce the size of the informal economy) is also supported when the variables representing the legal institutional system have a negative relationship with the informal economy. This result shows that, besides the tax burden, corruption, the poor quality of the legal system, and a low level of voice and accountability are also major factors driving most of the forces that operate in the informal sector.

Research has established that, despite many reform efforts, the institutional quality of Vietnam is still at an average level compared with other countries in terms of the WGI preliminary indicators. Vietnam is outstanding only in terms of political stability; in terms of the other indicators it falls below the general international level. On the indicators of voice, accountability and regulatory quality, Vietnam scores currently very low (Figure 6).

6.3 | The decline of the formal economy

An examination of trends in the size of the informal economy in Vietnam reveals that its rise or fall seems to be rule-based and influenced by the formal economy. There are two notable milestones: the periods 1997–98 (the Asian financial crisis) and 2008–09 (the global financial crisis).
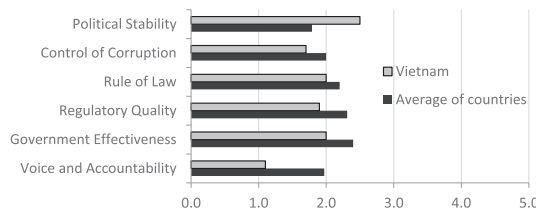
FIGURE 6 Institutional quality of Vietnam compared with other countries.
Source: author's calculation.

In both periods, the formal economy suffered considerably from a slowing of the growth momentum, and this decline of the formal economy is responsible for the rise of the informal economy. The third hypothesis – that as the official economy declines, GDP per capita goes down and unemployment increases, contributing to an increase in the size of the informal economy – is also supported when the variables representing the health of the formal economy have a negative relationship with the informal economy (see Figure 7). The results show that, when per capita income decreases by 1 per cent, the average size of the informal economy increases by 0.14 per cent of GDP, provided that other factors remain unchanged.

6.4 | Other causes

As mentioned, a country's business practices, cash consumption habits and cultural factors also have an impact on the size of the informal economy. The results from the empirical model show that the self-employment rate has a positive relationship with the informal economy, that is, when the self-employment rate increases, the informal economy is also likely to increase. The results perfectly match the characteristics of some Asian countries as the habit of cash consumption and the small household business type dominate the economy.[4] In Vietnam, according to General Statistics Office of Vietnam (2017), there were more than 4.7m individual business households in 2015, and this number has increased continuously over the years. Most individual businesses are still small in terms of fixed assets, sources of capital, and human resources. They are typically single-person operations; their owners have limited knowledge of the law and regulations, so their understanding of the law and their attitudes towards observing it vary and are often of poor quality. Moreover, the tax system and tax administration policies for business households have not been completed, so it is difficult to control and manage the operation of
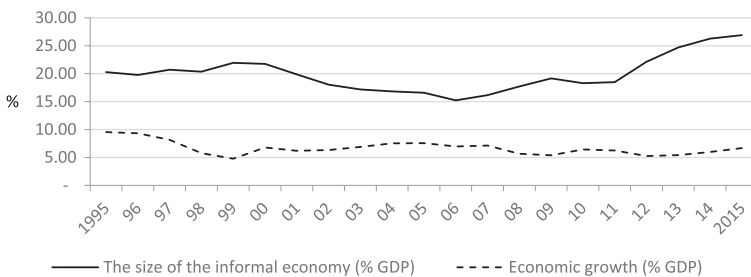
FIGURE 7 The relationship between the size of the formal economy and economic growth in Vietnam, 1995–2017.
Source: Author's calculation.

business households. In addition, the majority of households are operating in the informal sector, which means they are outside the control and supervision of the authorities.

6.5 | The loss of tax revenues

One of the first and most obvious effects of the informal economy is the loss of tax revenue. When the informal economy increases in size, the tax base shrinks and potential tax revenue falls. This is a burden on the state budget, especially when the need for public expenditure is increasing.

The ratio of tax revenues as a share of GDP to the informal economy's share of GDP indicated a close estimation of tax loss (Table 4). The estimation was made on the assumption that there is no difference in nature among individuals and businesses in the informal economy and the official economy. However, businesses operating in the informal economy are usually small or involved in illegal activities, which poses higher risks of tax evasion. Thus, the estimated figures here are considered as the maximum loss.

TABLE 4 Estimates of the loss of tax revenues (% GDP), 1995–2015

Year	The informal economy (% GDP)	Tax revenues (% GDP)	Loss of tax revenues (% GDP)
1995	20.3	18.70	3.79
1996	19.8	19.30	3.81
1997	20.7	16.90	3.50
1998	20.4	16.30	3.30
1999	21.9	16.20	3.55
2000	21.8	16.50	3.59
2001	19.9	18.70	3.72
2002	18.0	19.80	3.57
2003	17.2	20.70	3.56
2004	16.8	21.70	3.65
2005	16.6	20.90	3.46
2006	15.2	22.20	3.38
2007	16.1	21.50	3.47
2008	17.7	22.40	3.97
2009	19.2	20.60	3.94
2010	18.3	22.30	4.08
2011	18.5	22.20	4.11
2012	22.1	19.00	4.20
2013	24.7	19.10	4.72
2014	26.3	18.22	4.79
2015	26.9	18.20	4.90

Source: Author's calculations.

With the size and growth of the informal economy since 1995, the yearly tax revenue loss in Vietnam has been about 3.3 per cent of GDP at the lowest and 5 per cent of GDP at the highest. Obviously, this is a considerable figure as it accounts for over one fifth of total current tax revenues in Vietnam. Such a large tax loss in the informal economy, on top of other losses, can explain why the tax burden in Vietnam keeps increasing relative to other countries in the region. Increasing the tax burden is aimed at raising more tax revenues to compensate for the shortage and the loss from the informal economy as well as maintaining a given share of tax revenue in GDP and financing increasing expenditure. In a vicious circle, the increase in the tax burden encourages the development of the informal economy and leads to further loss of tax revenues. The result is not only an unstable tax system and a less sustainable budget balance, but also negative effects on businesses and individuals in the official sector. All of these harmful effects reduce the competitiveness and momentum of the economy as a whole.

7 | CONCLUSION AND POLICY IMPLICATIONS

7.1 | Conclusion

By using the MIMIC model to estimate the informal economy in Vietnam and Asian countries, this results of this study indicate that Vietnam's informal economy has increased rapidly since 2008, faster than those in other countries in the study. The average annual growth rate of Vietnam's informal economy has been about 1.2 per cent of GDP for this period, whereas the informal economies in other countries in the region such as Thailand, Malaysia, and Philippines have shown a negative growth rate – in other words, they have shrunk.

An empirical examination of the relations among the causes affecting the size of the informal sector indicates that tax burdens, the legal system, institutions, and government all have significant effects on the informal economy's expansion. High tax rates, complicated regulations and legal systems, corrupt government, and a lack of transparency and accountability are the main causes driving economic agents to participate in the unofficial sector.

Besides, the results indicate that the informal economy has a negative relationship with per capita GDP. A decline of the formal economy will contribute to expanding the informal economy where individuals find it easier to obtain jobs and incomes than in the official economy.

7.2 | Policy implications

From the estimation of the informal economy and the associated potential tax loss, it is clear that the potential for higher tax collections in Vietnam is still considerable. If the size of the informal sphere is controlled and reduced, or, in other words, if more entities are encouraged to participate in the official sector, tax revenues can increase by 2–3 per cent of GDP without any increase in the tax burden on the official economy. Furthermore, 'officialising' the economy not only helps to ensure the budget's stability and sustainability (by expanding the tax base and reducing the tax rate), but also improves the economy's productivity and competitiveness. Indirect solutions that expand the tax base, such as minimising the informal sphere, would be more sustainable and effective than directly increasing tax rates to improve tax revenues.

Based on the findings of the study, three important factors need to be addressed in order to narrow the informal economy and exploit the tax potential in this area.

7.2.1 | Improving the legal system

In order to encourage participation in the formal economy by individuals and businesses, especially individual business households, first of all the policies and regulations should be few in number but of a high quality. To achieve this, it is essential to promote democracy and encourage the participation of the people and the business community in the legislative process in order to frame and implement the rules and regulations effectively. To do this, the government must (a) create a favourable (legal and societal) environment for citizens and businesses to participate in the legislative process and review the policy, and (b) ensure openness, transparency, and easy access to information for the people and the business community when participating in lawmaking.

Second, the procedures of administrative reform, tax reform and regulations related to enterprises, especially individual business households, should be designed to encourage the formation of enterprises. Reforms should aim to lower legal barriers (reducing the number of accounting books and documents, tax procedures, corporate audits, and so forth, and simplifying enterprise registration and formation procedures), reduce the cost burden, simplify and rationalise management and business conditions, remove unacceptable regulations, increase simplicity and ease of implementation, and harmonise with international practices.

7.2.2 | Reducing the tax burden by minimising transaction and compliance costs and modernising the tax administration system

First, the tax system needs to be re-evaluated comprehensively to eliminate or simplify cumbersome procedures, digitise papers, render tax management electronic and reduce delays for taxpayers. The aim is to reduce tax administration costs and compliance costs for taxpayers, thereby reducing the tax burden for the business community and population generally. In addition, it is necessary to enhance utility services (such as speeding up electronic tax declaration and payment, automating the process of handling tax dossiers and procedures, providing tax payment services through banks and other forms of payment, and so forth) and other operations to support taxpayers at all stages, departments and sectors. Above all, the taxpayers should be considered as the heart of the service.

In addition, the tax system should ensure the implementation of a tax incentive policy (lowering the rate per unit of income and merchandise associated with the expansion of the tax base) in order to motivate individuals and businesses to expand production, investment and development, and to increase the competitiveness of goods and services in the country, thereby stimulating more and more individuals to participate in production and business activities in the formal economy.

7.2.3 | Limitation of public-sector corruption and removal of unofficial costs

Unofficial fees are becoming a burden on businesses, especially small businesses. However, solving this problem is always difficult because it requires cooperation between the authorities and the general public.

The authorities include legal officers and heads of public organisations. First of all, the legal system should be revised to avoid ambiguity and differences in the interpretation of laws.

Harassment and bribery result from attempts to take advantage of the ambiguity of the law. Second, the sanctions and the enforcement of the law dealing with corrupt practices must be strong. The process of error detection must be clear and open to show what behaviour tends to attract additional costs. As well, the penalties for corruption must be greater than the gains from it. Third, the head of the organisation must be determined to prevent corruption. Finally, if the regulatory burden is reduced, businesses will not need to break the law in order to carry out operations effectively.

The general public, both individuals and businesses, need to cooperate in detecting corrupt behaviour on the part of civil servants and accepting responsibility for denouncing it and reporting it to the relevant authorities. This requires a mechanism that encourages them to do so by guaranteeing them the protection of the law.

In summary, the possible solutions for this sector lie not in regulations such as prohibiting hawkers and street vendors, but in tackling the causes as listed above. In particular, in order to encourage entities to participate in the official economy, the government needs to make fundamental changes such as (a) *improving the legal system*, focusing on tax reform, investment and improving the conditions of business; (b) *controlling corruption in the public sector*, focusing on removing unofficial costs; and (c) *reducing the tax burden*. In the long run, these reforms will have positive effects and can be expected to improve businesses' and individuals' awareness, encourage them to engage in the official sphere and, in turn, limit the expansion of the informal sector.

NOTES

[1]Social security policies, for example, will not be effective when the majority of workers are in the informal sector, since they are unable to have access to the social security network when in difficult situations. Or the policy of non-cash incentives will not be effective when the size of the informal economy is large, since the informal sector always prefers to use cash to conceal transactions and evade taxes.

[2]As most of the activities taking place in the informal sector are often those of household businesses which seem to employ unskilled and untrained labourers on low salaries, productivity in this area is much lower than in the official economy. This means that if the informal economy accounts for a high percentage of the economy, it can lead to a decrease in labour productivity. Moreover, workers in the informal economy do not have the opportunity to undertake training and improve their skills, unlike workers in the formal sector.

[3]In this article the Corruption Perceptions Index has been adjusted from a scale of 0–100 to a scale of 0–10.

[4]The countries in the sample have a high self-employment rate, ranging from 65% to 75% (except Malaysia, where it is only about 30%).

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APPENDIX A: THE MIMIC APPROACH

The MIMIC model comprises of two structural parts. First, the measurement model links the informal economy with observed indicators (these indicators reflect the change in the size of the informal sector). Then the structural equation model (SEM) helps to explain the relations between the informal economy and the cause variables by which it is affected.

The SEM has the following equation:

$$\eta = \gamma' X + \zeta. \tag{3}$$

In this equation, $X = (x_{1t}, x_{2t}, ..., x_{qt})$ is a matrix ($q*1$) and each x_{it}, $i = 1, 2, ..., q$ is a cause of the informal economy – variable η; $\gamma' = (\gamma_1, \gamma_2, ..., \gamma_q)$ is coefficient of regression describing the relations between the latent and its causes; ζ is noise disturbance of the structural equation model.

The measurement model has the following equation:

$$y = \lambda \eta + \varepsilon. \tag{4}$$

In this equation: $y = (y_1, y_2, ..., y_p)$ is observed indicators ($p*1$); λ is coefficient of estimation of the regression equation and ε is the error of the measurement equation.

When equations 3 and 4 are combined, a multivariate regression equation is formed with endogenous variables $y_j, j = 1, 2, ..., p$ is an indicator of the informal economy η and exogenous variables $x_i, i = 1, 2, ..., q$ is causes of the informal economy η. The equation is expressed as follows:

From equation 4, we have: $\eta = \lambda^{-1}(y - \varepsilon)$. By replacing it to equation 3, we have the following equation:

$$\gamma' X + \varsigma = \lambda^{-1}(y - \varepsilon)$$
$$y = \lambda\gamma' X + \lambda\varsigma + \varepsilon$$
$$y = \pi X + z$$

where $\pi = \lambda\gamma'$ is a matrix with rank equal to 1 and $z = \lambda\varsigma + \varepsilon$ is error term.

Thus, the first step in the MIMIC model is to determine the assumed relations between the informal economy (the latent) and its causes. After identifying the relations and estimating the parameters, the MIMIC model's findings are used for calculating the MIMIC index.

However, the MIMIC approach provides an estimated size of the informal economy through the index. In other words, estimated results from the MIMIC model give out only relative, not absolute, estimates of the size of informal economy. Therefore, in order to estimate the size and the trend of this sector, it is necessary to convert the MIMIC index into an actual figure. Following previous studies, benchmarking is commonly used for this process. Accordingly, a benchmark is determined by using the value of a year as a basis for conversion through the following formula:

$$\widehat{\eta}_t = \frac{\widetilde{\eta}_t}{\widetilde{\eta}_x} \eta_x^*. \tag{5}$$

In this equation: $\widehat{\eta}_t$ is standardised size of the informal economy, $\widetilde{\eta}_t$ is a MIMIC index at the time t calculated by the regression equation, $\widetilde{\eta}_x$ is a MIMIC index in the basic year calculated to the regression equation and η_x^* is the size of the informal economy in the basic year.

If we choose 2000, for example, as the base year and make an estimate of the size of the informal economy for 1995, the formula in equation 5 is as follows:

$$\widehat{\eta}_{1995} = \frac{\widetilde{\eta}_{1995}}{\widetilde{\eta}_{2000}} \eta_{2000}^*.$$

APPENDIX B: TABLES A1–A3

TABLE A1 Relationship between the informal economy and the growth rate of GDP

Relation	Authors	Country	Approach/notes
Positive	Tedds (1998)	Canada	MIMIC
	Giles (1999)	New Zealand	MIMIC
	Giles and Tedds (2002)	Canada	MIMIC
	Schneider, Chatterjee, and Chaudhuri (2003)	Countries in Asia	MIMIC
Negative	Frey and Weck-Hanneman (1984)	OECD	MIMIC
	Loayza (1997)	14 Latin American countries	MIMIC
	Kaufmann and Kaliberda (1996)	Transition countries	The shadow economy mitigates the decrease in official GDP, particularly in countries that experienced a large drop. They find that for every 10% cumulative decline in official GDP, the share of the irregular economy in the overall increases by almost 4%
	Eilat and Zinnes (2000)	24 transition countries	A change in GDP is associated with an opposite change in the shadow's size and a one-dollar fall in GDP is associated with a 31% increase in the size of the shadow economy
	Schneider and Enste (2000)	76 countries	MIMIC

Source: Dell'Anno (2003).

TABLE A2 Estimates of the size of the informal economy in Vietnam and selected countries (% GDP), 1995–2015

Year	Vietnam	Indonesia	India	Thailand	Philippines	Malaysia	Laos	Cambodia	Sri Lanka	China
1995	20.3	23.5	19.2	32.5	34.2	34.7	33.1	32.3	42.5	14.7
1996	19.8	27.7	18.8	34.2	32.6	34.0	31.6	34.2	41.5	16.4
1997	20.7	22.9	19.6	34.9	34.5	29.2	33.0	42.7	42.4	17.2
1998	20.4	21.6	21.3	39.3	37.5	31.6	31.9	45.6	40.0	19.4
1999	21.9	24.3	21.6	40.3	34.3	30.1	29.8	48.9	40.0	18.3
2000	21.8	25.5	22.1	39.5	35.4	29.0	30.6	50.1	38.4	17.5
2001	19.9	29.6	20.1	35.8	35.0	30.4	27.4	41.9	39.4	18.3
2002	18.0	31.6	20.2	34.5	35.2	30.4	26.8	44.8	41.4	18.9
2003	17.2	33.7	21.2	30.2	33.5	31.2	26.8	37.1	40.1	19.2
2004	16.8	36.8	20.8	30.8	35.1	32.8	27.3	33.6	41.6	20.1
2005	16.6	41.9	22.5	27.9	29.0	33.6	28.6	37.7	38.4	19.9
2006	15.2	41.4	23.1	21.7	28.2	30.1	25.1	35.6	35.0	16.6

(*Continues*)

TABLE A2   (*Continued*)

Year	Vietnam	Indonesia	India	Thailand	Philippines	Malaysia	Laos	Cambodia	Sri Lanka	China
2007	16.1	39.6	21.7	22.3	26.0	30.1	23.7	33.5	33.0	18.1
2008	17.7	38.8	22.8	23.6	24.7	29.8	25.9	27.9	30.7	21.4
2009	19.2	41.1	22.7	23.7	26.7	30.8	21.4	37.0	31.1	22.6
2010	18.3	38.4	21.4	23.7	26.4	29.4	23.4	42.4	29.9	19.7
2011	18.5	39.7	20.8	22.8	26.3	30.0	23.2	44.3	28.7	22.7
2012	22.1	41.5	22.7	25.3	28.3	29.6	28.7	46.8	31.0	24.1
2013	24.7	41.3	24.1	24.4	30.2	28.3	32.3	44.9	28.9	25.8
2014	26.3	43.2	25.0	21.0	31.8	27.7	31.1	35.2	28.4	23.3
2015	26.9	45.1	22.6	21.1	30.8	26.2	30.9	35.1	33.3	23.0

Source: Author's calculations.

TABLE A3   Tax compliance costs in Vietnam:

Compared with selected Asian countries, 2011 and 2017										
	Vietnam		**Philippines**		**Thailand**		**Malaysia**		**China**	
Index	**2011**	**2017**	**2011**	**2017**	**2011**	**2017**	**2011**	**2017**	**2011**	**2017**
Paying taxes (times/year)	32	31	47	28	23	21	12	9	7	9
Time (hours/year)	941	540	195	185	264	266	145	164	398	259
Compared with the regional and OECD countries										
	Vietnam			**Asia Pacific, 2011**				**OECD, 2011**		
Index	**2011**		**2017**							
Paying taxes (times/year)	32		31		24.5				14.2	
Time (hours/year)	941		540		218.2				199.3	

Sources: World Bank (2011, 2017).