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A Better Understanding of Thailand's Informal Sector

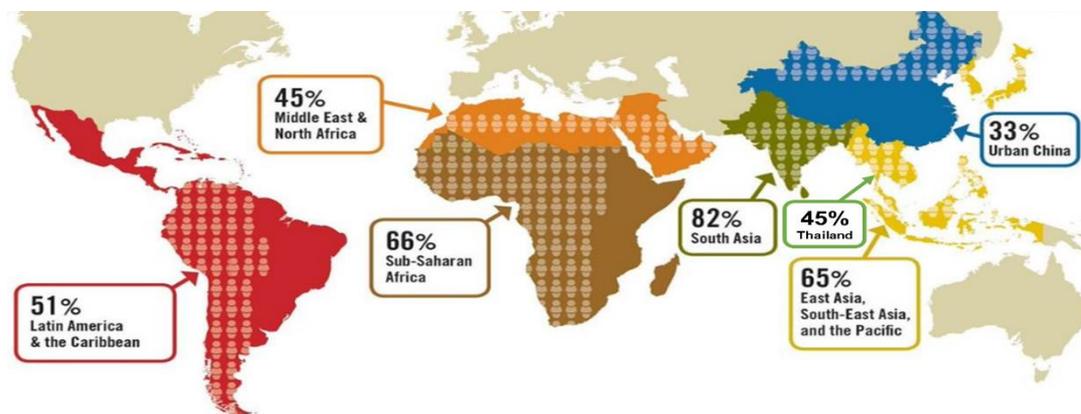
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Informal Employment as a Percentage of Non-agricultural Employment



Remark: Informal Employment in 2016

Source: <https://www.iied.org/informal-economy-green-growth-conference-pinpoints-need-for-new-policy-agenda>

The definition of the informal sector remains inconclusive, leaving ample room for further debates. This paper summarises different approaches developed to estimate the size of the informal sector. An important finding of the paper is that activities of the informal sector induce “informal employment” that outweighs “formal employment” and hence provides a cushion in the event of economic crisis.

1. Introduction

The informal sector is important in most developing countries, particularly so in Thailand. Despite difficulties in measuring the activities of this elusive economic sector, its interactions with and consequences for the formal sector have generated concerns and interests among economists, especially its impact on inequality and poverty reduction. Moreover, a growing informal economy may distort official indicators, resulting in inefficient allocation of public resources. The most important causes of the informal economy include high tax burden, social security contribution requirements, the complexity of the tax system, the intensity of regulations, and administrative deficiency. In this regard, the understanding about the contribution of

the informal sector to the country is crucial for policy formulation.

Estimating the size of a shadow economy is a difficult and challenging task. While a number of measurement techniques have been developed, there is no complete set of indicators to measure the size of the informal sector. This paper compares different data sources and approaches to arrive at the estimates. Although different approaches result in different estimates of the informal sector, all have reaffirmed its significance to the country, both in terms of economic and social welfare.

The paper is organized as follows. Section 2 reviews definitions as well as the advantages and disadvantages of the informal sector. Section 3 summarizes different methods

which can be applied to estimate the size of informal sector. The last section concludes main findings of the paper.

2. Understanding the Informal Sector

2.1 Definition of Informal Sector

Although there is no unique definition of the informal economy, it typically refers to economic transactions that are not explicitly observed or recognized. In defining “informality” earlier studies often consider certain sets of characteristics, namely, the existence of market transaction, the legality of the production, arrangement, distribution processes, and the goods or services themselves. Measuring the size of the informal sector is even more challenging with a change in legality status. For example, some activities like gambling and prostitution, previously treated as illegal, are now deemed legal in some countries.

To summarize, the informality can be defined in terms of market transaction and legality¹ as follows:

- *Non-market transaction, legal output, but illegal arrangement.* Examples are goods and services produced by households which are not traded or paid for.
- *Market transaction, legal output, and legal arrangement.* Examples are goods and services produced by small-scale

producers, which are sold either as intermediate goods and services to other producers or as part of final demand.

- *Market transaction, legal output, but illegal arrangement.* Examples are goods and services produced by registered producers but involve some illegality (for example, avoidance of minimum wage or factory safety regulation).
- *Market transaction, illegal output, and illegal arrangement.* Examples are goods and services produced by criminal sector (for example, drugs).

The criteria used to define the informal sector depend on the experts' perspective, whether to focus on economic, social, or political aspects. In recent years, however, analyzing the informal sector in the context of the employment arrangements not legally regulated and protected has gained increasing popularity.

2.2 Advantages and Disadvantages of the Informal Sector

The informal sector constitutes a significant part of the economy and could generate both positive and negative externalities to the economy. Earlier studies have mentioned several economic and social advantages of the informal sector. *Activities of informal sector induce “informal employment” which, for several countries, outweighs “formal*

¹ See J.J. Thomas (1992); Office of the National Economic and Social Development Council. (2003); Edgar L., Feige, and Urban, I. (2008); Andrews, D.,

Sanchez, A. C., Johansson, A. (2011); Georgiou, M. G. (2007); Thomas, Jim J. (1992) and Ogunc, Fethi, and Yilmaz, Gokhan. (2000).

employment” and hence provides a cushion in the event of economic crisis. The rise in informal employment can help displaced workers to generate their own income amid economic crisis, thereby lessening reliance on government benefits. Moreover, empirical studies for developing countries revealed that activities of the informal sector have put downward pressure on wages in the formal sector, and in turn help maintain competitiveness².

Nonetheless, there are also several disadvantages worth noted. *First*, the informal sector obviously causes distortion in tax collection and may result in the government imposing higher tax rates on the formal sector to help sustain revenues. *Second*, workers in this sector often receive lower wages and working conditions compared with those working in the formal sector. *Third*, lack of coverage of the informal sector by conventional economic indicators may adversely affect the quality of economic analysis and assessment and hence could mislead policy formulation. *Finally*, it may eventually induce corruption and political lobbying.

3. Estimation of the Informal Sector

This section summarizes various methods to measure the size of the informal economy, as well as their pros and cons.

² See Nabuteya Amenya, G. (2007) and George T., Lesica. (2011).

3.1 Direct Approaches

3.1.1 Using Proxy Variables

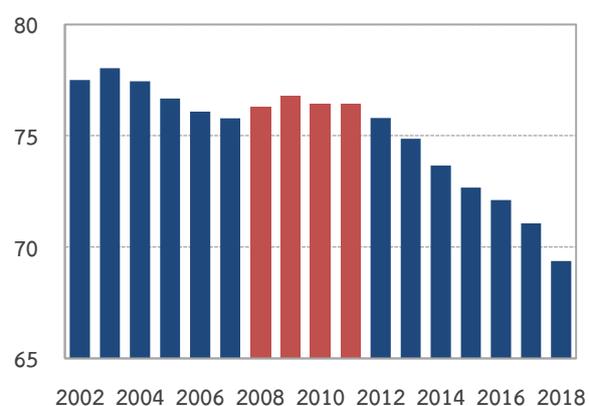
Since the size of the informal sector is difficult to measure, the number of social security and self-employed persons are widely used as proxy variables.

1) Using social security workers as proxy

Workers outside the social security system are used as an indicator of the informal economy. In Thailand, the Social Security Act was enacted in 1954. However, the economic condition of the country at that time was deemed inappropriate for enforcement of the Act. The Draft of the Social Security Act 1990 was approved by the parliament and went into force on 2 September 1990.

In the initial stage, tentative protection coverage shall be provided to businesses with over 20 employees. It was extended to businesses with over 10 employees in 1993 and was extended to business with over 1 employees in 2002, reflecting the government’s concern for the quality of life of

Figure 1: Uninsured persons in Social Security Workers (% of Total Employment)



Source: Social Security Office, Ministry of Labour.

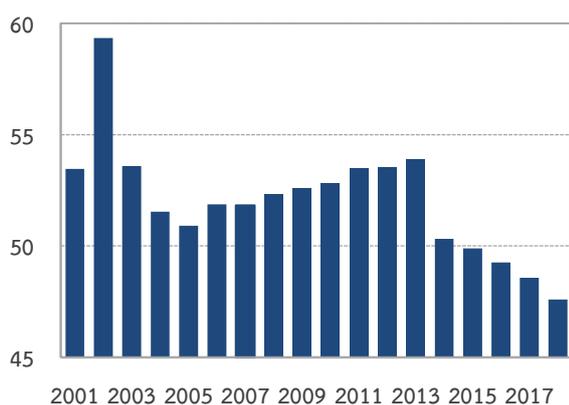
labor. Over the past decade, the number of insured persons continued increasing from 22.5% (6.9 million) in 2002 to 30.6% (11.6 million) in 2018.

The size of informal sector was about three fourths (Figure 1) and tended to decrease over time. However, the estimated informal sector was quite large since the Social Security Act does not apply to all employments in the country, hence resulting in overestimated figures.

2) Using own-account workers as proxy

The share of own-account workers is used to approximate the size of the informal sector³ as they intend to conceal their sales or revenue so as to avoid paying taxes. Based on this proxy, the size of the informal sector is estimated to be about half of total employment. (Figure 2).

Figure 2: Own-account Workers
(% of Total Employment)



Source: National Statistical Office.

3.1.2 Micro-surveys

The direct method based on survey is quite straightforward and widely accepted in many countries. Micro-surveys provide detailed information about the structure of the informal economy. The structure of the questionnaire can be designed in a “respondent-friendly” manner so as to avoid misunderstanding and elevate the reliability and accuracy of the responses. Moreover, the survey frame planned for and sampling technique adopted should be cost-efficient, as conducting such surveys could be resource intensive.

In Thailand, the National Statistics Office (NSO)⁴ has initiated the Informal Employment Annual Survey, with the first one conducted in 2005. This annual survey serves as the main data source for estimation of the size of the informal sector. The survey is usually conducted during the third quarter of each year simultaneously with the labor force survey (Appendix 1). **The definition of informal employment used by the NSO covers employed persons who are not protected and not eligible for social security provision.**

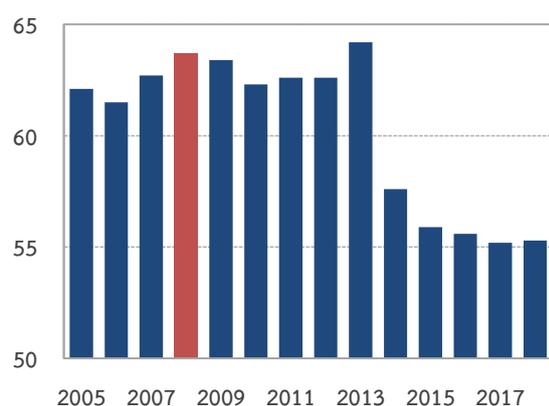
The 2018 survey revealed that about 21.2 million workers, or 55.3% of the total employment (Figure 3), were engaged in the informal sector, with proportion of male and female workers not much different, i.e., 11.5 million or 55.2% and 9.5 million or 44.8%,

³ See International Labour Organization. (2012) and Pratap, Sangeeta S. and Quintin, E. (2006).

⁴ See National Statistical Offices (NSO) (2018).

respectively. When comparing the results for 2005 – 2017, it was found that the proportion of informal employment remained stable throughout the period. During 2005 – 2013, the proportion of informal employment stood above 60% and later slightly declined below 60% since 2014.

Figure 3: Micro-surveys
(% of Total Employment)



Source: “The Informal Employment Survey 2018”, National Statistical Office.

3.2 Indirect Approaches

3.2.1 Discrepancy between national expenditure and income

Conceptually, all types of income generated from production would be included in national income, except for those generated from informal activities. On the contrary, expenditures of both formal and informal sectors are generally well captured. **This approach would yield a good estimate of the size of the informal sector, providing that the two accounts were measured**

⁵ See Schneider, F. (2002) and Schneider, F., Buehn, A., and Montemegro, C. E. (2010).

⁶ See Burke, P. J. (2016); Kaufmann & Kaliberda (1996); Phoumin, H., and Kimura, S. (2014);

completely independently, with no other errors due to estimation or coverage.

However, likely national accounts statisticians in general will be inclined to minimize this discrepancy⁵, this estimate may therefore be not applicable.

3.2.2 Electricity consumption

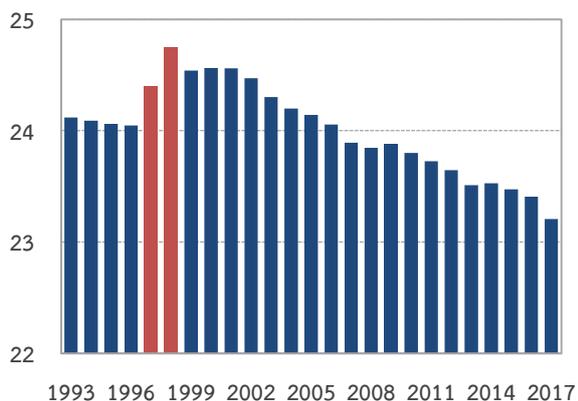
As electricity consumption is generally a good indicator for overall economic activity, the difference between GDP growth and electricity usage growth could serve as a proxy for the growth rate of informal activity.⁶ Such indirect estimation was among the most widely used methods as it generally covered all economic activities — whether legal, illegal, official, or unofficial.

The drawbacks for this approach are that not all informal activities involve electricity usage, they can alternatively rely on other energy sources such as gas and charcoal. Moreover, the electricity consumption pattern of the formal sector might vary over time (Appendix 2).

Based on this approach, the size of the informal sector was found to be quite stable at one-fourth of official GDP (Figure 4). The size of the informal sector was estimated to be largest during the 1998 economic crisis **thus reflecting the “cushion” function of the informal sector.**

Mohanty, A. and Chaturvedi, D. (2015) and Hanousek, J and Palda, F. (2003).

Figure 4: Size of Informal Sector
Using Electricity approach (%)



Source: Authors' calculation.

3.2.3 Monetary approach

A number of studies used monetary approach to measure the size of the informal sector as time series data are readily available. However, there are several problems associated with this approach, in particular the unrealistic assumptions that (i) as informal activity does not exist in the initial period; and (ii) the relationship between the volume of transaction and official GNP does not change over time.

1) Currency Ratio (Cash-to-Deposit Ratio)

The currency ratio method, introduced by Gutmann, P.M., (1977), assumes that all transactions in the informal sector use only cash for the purpose of tax evasion. Thus, an increase in the currency ratio may represent a rise in the informal economy. If the amount of currency used to make hidden transactions can be estimated, then it could be multiplied by the income-velocity of money to get a measure

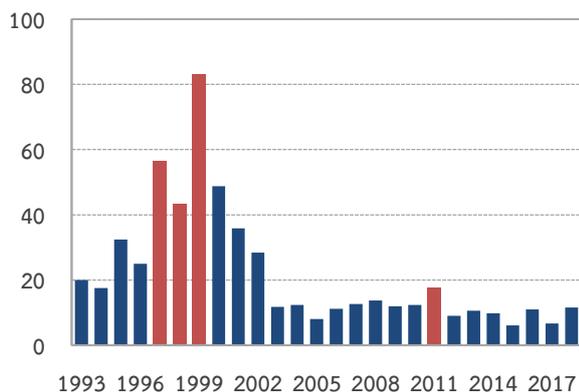
of the size of the informal economy. The ratio of the size of the informal to formal sector is therefore assumed to be equal to the ratio of cash used in the informal sector over cash and demand deposits of the formal sector (i.e., assumes demand deposits for the informal sector).

In order to obtain the size of the informal sector, this method assumed some initial period during which the size of the informal sector is zero. The ratio of cash to deposit is assumed constant over time. The increase in demand for cash indicates expansion of the informal sector. Hence, the difference between the cash-to-deposit ratio from the initial period shows how much cash is used in the informal sector⁷ (Appendix 3).

Based on this method, the size of the informal sector derived from the currency ratio was found to decrease over time (Figure 5). However, this method indicated that the size of the informal sector increasing in 2011, the manufacturing sector was severely affected by the flooding crises.

⁷ See Davidescu, A., Strat, V.A., and Paul, A. M. (2015).

Figure 5: Size of Informal Sector using Currency Ratio (% of GNP)



Source: Authors' calculation.

2) Currency Demand

The Currency Demand Approach (CDA) based on the work of Cagan (1958), is the most popular method to estimate the informal economy among the so-called indirect macroeconomic approaches. The CDA measures the size of the informal economy in two stages: (1) econometric estimation of an aggregate money demand equation, with a specific component related to cash transactions in the informal sector; (2) computation of the value of these informal transactions via the quantity theory of money⁸. The crucial assumptions are that the informal sector is caused by changes in taxation, and that cash is used as means of exchange. This method requires estimating currency demand, which is the ratio of cash to M1 ($\frac{C}{M1}$).

The currency demand can be modeled as a function of the effective tax rate (t), deposit

interest rate (i), per capita income ($\frac{Y}{N}$), and GDP per capita (*capita*) as follow:

$$\log\left(\frac{C}{M1}\right) = \beta_0 + \beta_1 \log(t) + \beta_2 \log(i) + \beta_3 \log\left(\frac{Y}{N}\right) + \beta_4 \log(\text{capita}) + \varepsilon$$

The size of the informal sector can be calculated by imposing a zero tax rate. The difference between these two estimates represents currency in circulation in the informal sector. Multiplying this difference by the money velocity yields the size of the informal sector.

Vorapol (2007) used the currency demand approach to estimate the size of informal economy in Thailand in 2007 before and after the issuance of Anti-money Laundering Act, B.E. 2542. The result showed that the size of informal economy in Thailand was 38.76% of GNP.

4. Conclusions

The definition of the informal sector remains inconclusive, leaving ample room for further debates. Different approaches developed to estimate the size of the informal sector were explored and summarized in this paper, each having its pros and cons and yielding different results. Further studies could be done to develop alternative approaches to estimate the size of the informal sector, possibly through the use of surveys, administrative data, and estimation models.

⁸ See Ardizzi et al., (2011).

For the case of Thailand, micro-surveys which are rich in in-depth information seemed to be a proper and more practical approach from the authors' point of view.

Aside from the methodological aspect, closer collaboration among specialists and authorities in relevant fields should also be emphasized to pave way for better understanding of the functioning of the informal economy, linkages to the formal sector, as well as policy implications. Special attention should go to reducing the exploitability of “the players” in the informal sector, while maintaining positive effects this sector could generate to the economy or community as a whole.

Appendix 1: Stratified Two-stage Sampling

A stratified two-stage sampling was adopted to the survey. Provinces were constituted strata. The primary and secondary sampling units were enumeration areas (EAs) for municipal and non-municipal areas and private households and persons in the group of employee households respectively. Bangkok Metropolis and provinces were constituted strata. There were altogether 77 strata. Each stratum (excluding Bangkok Metropolis) was divided into two parts according to the type of local administration, namely municipal areas and non-municipal areas. The primary and secondary sampling units were enumeration areas (EAs) for municipal areas and non-municipal areas and private household persons in the collective households respectively.

At the first stage, the EAs based on the 2010 census frame was updated from other sample surveys and selected separately and independently in each stratum by using probability proportional to size, giving the total number of households. (The total number of sampled EAs was 5,970 from 127,460 EAs.)

At the second stage, private households and persons in the collective households were our ultimate sampling units. A new listing of private households was made for every sampled EA to serve as the sampling form. In each sampled EA, a systematic sample of private households were selected with the following sample size. (Municipal areas: 16 sample households per EA, Non- municipal

areas: 12 sample households). The data collection was face-to-face interview with head of household or members of the household by the high experienced interviewers. Face-to-face data collection was historically paper-based, but in 2013, NSO has started using tablet offering the advantages of data entry during the interview and consistency.

Appendix 2: Elasticity of electricity consumption to GDP⁹

The elasticity can be estimated by transforming the variables into logarithmic form¹⁰ and “b₁” is the degree of responsiveness of electricity consumption to one percentage change in real GDP.

$$\log(Elec_t) = b_0 + b_1 \log(GDP_t) + \varepsilon_t$$

The Dynamic OLS (DOLS) technique is applied for calculating the long run elasticity. The DOLS procedure introduced by Stock and Watson (1993) involves estimation of long-run equilibrium via which involves in regressing one of the I(1) variable by augmenting the co-integrating equation with lags and lead of these first difference of the regressor. The essence of incorporating the first difference variables and the associated lags and leads is to make the resulting co-integrating equation error term is orthogonal and to correct for regressor endogeneity.

$$y_t = \beta x_t + \gamma_1 \Delta x_{t-1} + \gamma_2 \Delta x_{t-2} + \dots + \gamma_p \Delta x_{t-p} + \varepsilon_t$$

$$E[\varepsilon_t | x_t, \Delta x_{t-1}, \Delta x_{t-2}, \dots, \Delta x_{t-p}] = 0$$

$$E[\varepsilon_t | x_j] = 0 \rightarrow \varepsilon_t \perp x_t$$

In addition it has the same asymptotic optimality properties as the Johansen distribution. HAC (Newey–West) covariance matrix estimator is adopted in executing DOLS.

From the above output in table 1, it can be interpreted that about 96% of variation in

growth in electricity consumption is explained by variations in growth in Real GDP. The $\log(GDP_t)$ coefficient is statistically significant and an annual growth of real GDP by 1% will lead to annual increase of electricity consumption by 1.278%. At 99% confident level, the $\log(GDP_t)$ is observed to be a statistically significant with zero p-value corroborates this observation.

However, the estimate of elasticity of GDP with respect to electricity consumption by the Ministry of Energy of 1.03 for 2009-2018 is close to the long-run elasticity of 1.278.

Table 1: Elasticity of electricity consumption to GDP

Dependent Variable: log(ELEC)				
Method: Dynamic Least Squares (DOLS)				
Sample (adjusted): 1993Q2 2016Q2				
Included observations: 93 after adjustments				
Cointegrating equation deterministics: C				
Automatic leads and lags specification (lead=10 and lag=0 based on SIC criterion, max=12)				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Stat.	Prob.
C	5.767	0.855	6.745	0.000
log(GDPR)	1.278	0.060	21.282	0.000
R-squared	0.967	Mean dependent var		24.084
Adjusted R-squared	0.962	S.D. dependent var		0.323
S.E. of regression	0.063	Sum squared resid		0.318

⁹ See Mohanty, A. and Chaturvedi, D. (2015).

¹⁰ Since the electricity consumption and real GDP regression are cointegrated, standard interpretation on regression results can be obtained.

Appendix 3: Currency Ratio Approach

The main idea in Currency ratio approach is that a rise in currency and demand deposit is likely a good indicator of transactions which are not reported to the government authorities.

Following Cagan (1985) and Guttman (1977), the specifications of Currency ratio approach can be expressed as below:

$$C = C_u + C_o \quad (1)$$

$$D = D_u + D_o \quad (2)$$

$$k_o = \frac{C_o}{D_o} \quad (3)$$

$$k_u = \frac{C_u}{D_u} \quad (4)$$

$$v_o = \frac{Y_o}{(C_o + D_o)} \quad (5)$$

$$v_u = \frac{Y_u}{(C_u + D_u)} \quad (6)$$

$$\beta = \frac{v_o}{v_u} \quad (7)$$

Where:

C = actual currency stocks;

D = actual stock of demand deposits;

Y_o = observed income;

u = subscript it denote unobserved sector;

o = subscript it denote observed sector;

k_o = ratio of currency to demand deposit in observed sector;

k_u = ratio of currency to demand deposit in unobserved sector;

v_o = observed sector income velocity;

v_u = unobserved sector income velocity;

Equation (1) and (2) decompose the actual stocks of currency and demand deposits into their unreported and reported components. Equation (3) and (4) are the definitions of the

term k which indicates the ratio of currency holding to demand deposits and in the same way, equation (5) and (6) show income velocity in both economies.

To find out the unregistered economy Y_u by using equation (6) as a function of observable variables Y_o , C , D and the parameters β , k_u , k_o , we utilize the equations from (1) to (7). This repeated substitution yields the following formula:

$$Y_u = \frac{1}{\beta} \times Y_o \times \frac{(k_u + 1)(C - k_o \times D)}{(k_o + 1)(k_u \times D - C)} \quad (8)$$

Under assumptions that unregistered transactions are always paid by currency and income velocity of money is the same in both sectors official and unofficial, the currency ratio method becomes:

$$Y_u = Y_o \times \frac{(C - k_o \times D)}{(k_o + 1) \times D} \quad (9)$$

The estimated size of the underground economic activity can be derived as the product of underground currency (actual currency less that hold in the above-ground sector) and the income velocity of above-ground M1.

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