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BLACK ECONOMY IN MADURA, AN ELECTRICITY CONSUMPTION APPROACH

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ABSTRACT

This research aims to provide information for the government, stakeholders, and society on the quantity and types of economic activities on Madura Island that are undetected by the State Tax System. The method used in this research is the electricity consumption approach, i.e., comparing the total income of four regencies in Madura Island (Gross Regional Domestic Product) to the total electricity consumption during the 2016-2021 period. By this approach, the amount of Black Economy in four regencies in Madura Island compared to the total economic activities during 2016-2021 can be discovered, as well as the types of economic activities indicated as Black Economy.

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Introduction

For now, Gross Domestic Product (GDP) is considered the ideal standard to measure the development performance of a country. Mankiw (2014) defines GDP as the monetary value of all final goods and services produced in a country in a given period. One of the GDP calculation process weaknesses is the absence of black economy activities. In addition to not being counted in GDP calculation, these activities can disserve the country from the point of view of the lost tax revenue. In this case, black economy activities affect a country's economy from the GDP and National Budget or state revenue perspectives.

Black economy (BE) is the reaction of individuals who feel overburdened by the state (Pyle, 1989). Thomas (1992) states this is the cause of the emergence of illegal economic activities. They prefer to do these illegal activities rather than express their rejection or dissatisfaction through formal demonstrations (Lippert and Walker, 1997). BE is often considered a phenomenon that only relates to public sectors, i.e., activities associated with goods provision and public services (Venkatesh, 2006). BE is a combined product of the public and private sectors (Schneider and Enste, 2004). It has even been proven that BE has a more significant value on private sector activities than public sector activities (Kumar, 2017).

Elgin and Oztunali (2012) stated that the quantity of BE in developed countries was around 12-15% of the total GDP, whereas it reached 30-40% in developing countries. The highest BE activities were found in Latin America and Africa, surpassing 35%.

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BE activities are different in each region; for example, 1) in Latin America, they are dominated by drug trafficking and gun smuggling; 2) in South Asia (India and Thailand), they come from informal sectors, illegal logging, and prostitution, whereas in Myanmar from drug and gun trafficking, 3) Africa has them from informal sectors, gun trafficking, and prostitution, and 4) in Indonesia, they come from informal sectors, illegal logging, illegal fishing, and smuggling of legal goods such as electronic products and fuel, as well as the illegal ones, such as drugs, alcoholic beverages, etc. (OECD, 2018).

The increasing quantity of BE in developing countries is more likely a result of evil bureaucracy, where the government policies cannot minimize such activities, and even the state apparatus allows these activities to take place to get some amount of personal gain. BE in developed countries can be minimized because of the high awareness of the society to pay taxes, and the sophisticated tax collection and control system, which is based on a single identity. The system is integrated with monetary sectors, so every financial transaction their citizens do can easily be traced down. One of the methods of tax evasion that is still difficult to deal with is placing companies with all the funds in a low-tax country (tax haven), so the taxes that should have been collected move to another country (Scheneider and Enste, 2004).

So far, most economists consider that the drivers of economic growth are investment and consumption. These different perspectives have significant implications for development planning and economic growth. Ayres (2009), an INSEAD economist, stated that the real driver of economic activities was energy, especially electrical energy. Empirical data from various countries show that every one kWh of electricity consumption will contribute around USD 4-5 to GDP. Tumiran (2016), a member of the National Energy Board, has the same viewpoint as Ayres, that the demand-driven approach is unsuitable for countries with low GDP per capita. Currently, the growth of electrical energy should not follow economic growth; on the contrary, the availability of electrical energy should drive up the economy (supply-driven).

Kaufmann and Kaliberda (1996) considered electricity consumption as the physical indicator of the whole economic activity (both formal and informal). Having the whole proxy measurement for the economy and subtracting it from the estimated GDP of formal sectors, Kaufmann and Kaliberda obtained the value of the estimated GDP of informal sectors. The total amount of economic activities and the electricity consumption have been observed empirically at the global level, where the electrical energy elasticity growth/GDP approaches the value of one, it indicates that the electrical energy is already used productively in economic activities, on the other hand, if it's more than one. It's categorized as inefficient, and the black economy factor is suspected to occur.

Currency demand is affected by GDP, inflation, interest rate (BI Rate), and tax expense (tax ratio). Research on the black economy or black economy in Indonesia that was conducted by Samuda & Andriani (2016), Iskandar and Mulyawan (2017), and Yulianti (2018) all used a monetary approach, i.e., currency demand sensitivity constructed by Tanzi (1980), Faal (2003), and Scheider & Enste (2004). This research further calculates the quantity of black economy in Madura Island using a physical input approach, i.e., the electricity consumption approach constructed by Kaufmann-Kaliberda (1996) and Kyle and Waren (2011).

Literature Review

Black Economy Phenomenon

The black economy is called by various terms worldwide, such as black money, parallel economy, unaccounted economy, illegal economy, informal economy, etc.

Black Money

Black money refers to the cash saved from an individual's hidden income. From the earned Income, some is spent, and the rest is saved. The saved amount is invested in

multiplying the individual's wealth by lending it to others as business capital and gaining some profit. The cash deposit (as a stock) aims to make it difficult for the stakeholders to monitor and track the trace. (Faal, 2003).

Common sense is that BE transactions are always related to cash; if the demand for cash rises above the relative or normal value, it can be concluded that BE has also increased. (Scheneider and Enste, 2004).

Informal Economy

According to Kumar (2017), westerners see BE as a form of an informal economy. In those parts of the world, it is common for people to have second or third jobs, and the income from these activities is not reported for tax purposes. These activities are different from the formal job that an individual does to earn his primary income, so it can also be called a parallel economy. These extra incomes from informal activities should also be taxed, but since they are not reported, they are hidden from the national income calculation.

In Indonesia, BE is obtained from various economic activities. In informal sectors, society members such as small grocery store owners, street food vendors (such as meatballs, chicken noodles, fried rice, egg crust, mixed fruit ice dessert vendors, etc.), and those who work in the agricultural sector as farm workers certainly have taxable income, but probably still below the tax limit, and they cannot be included in the category of BE. So, some parts of these informal sectors indeed create hidden incomes, but most society members in these sectors cannot be categorized as BE.

The black economy is created both in formal and informal economic sectors. Most formal sectors create a large amount of BE, such as corporations, transportation entrepreneurs, construction business people, brokers, contractors, etc. Then it is not appropriate to say that BE in Indonesia comes only from informal economic activities.

Parallel Economy

Kumar (2017) implies the existence of two lines whose intersection point is at infinity; in other words, there is no intersection between them. This term is used because some think the black economy (BE) and the official economy (OE) are separate. But, in Indonesia, BE, and OE are interconnected. An individual can create hidden and official income from a single economic activity. When someone buys a property, for example, he has to pay the hidden component (40%), then the official component. In this case, the property seller obtains both hidden and official income simultaneously. Similarly, when cement manufacturers manipulate the invoices to be a few percent lower than they should be, they create unreported hidden incomes and reported official incomes from their production lines.

The same activities create hidden and official income, but the hidden income can be converted into official income and vice versa. An individual can get a book entry (a transfer with no physical ownership certificates) from a broker, let's say, in the stock market. In making a profit, someone can convert hidden incomes into official ones. On the other hand, when taking a loss, someone can convert official incomes into hidden ones so that the hidden incomes of someone become official, and the official incomes of someone else become hidden.

Illegal Economy

A nation's economy is built on various activities done by its citizens, doing various professions such as farmers, self-employed workers, business people, manufacturers, etc. Activities permitted by law are called legal activities, whereas those prohibited by law are called illegal activities. For example, narcotics trading, prostitution, gambling, smuggling, and theft are all illegal activities. According to Scheneider and Enste (2004), illegal activities are included in BE calculation because these activities are legalized in developed countries but under strong supervision. But these illegal activities are not included in national income

calculation because of their harmful impacts on society. The government attempts to depress the existence of these illegal activities because they have substantial social impacts.

Illegal activities create incomes that cannot be reported for tax interest, and that's why they are included in the BE. But, as we already know, many society members do entirely legal activities but create BE by not reporting a portion of their income. In this case, they do illegal activities. An example of this case is a restaurant that doesn't report some of its sales. Also, teachers who don't report the incomes they earn from several pieces of training they conduct. That's why in Indonesia, BE consists of legal and illegal activities, with the primary goal being tax evasion.

Unaccounted Economy

The black economy is often considered a part of the unaccounted economy. But what is the definition of an accounted economy? The economy consists of primary, secondary, and tertiary sectors. Then these sectors are divided into 17 main sectors. The contributions of each of these sectors are summed up to obtain the total national income. This calculation can be obtained at National Accounting Statistics (BPS, Central Bureau of Statistics).

The rough calculation of national income is called Gross Domestic Product or Official Economy (OE). It is estimated using a few methods to calculate the contributions of the various economic sectors. It is commonly assumed that OE activities are included in the accounting, whereas BE activities are not. (Yanagisawa, 2011)

Definition of Black Economy

The above description clarifies that BE measurement is essential to discover a nation's income. Two aspects should be considered to better understand what is meant by overall economy measurement and BE. First, the availability of data to be measured. Second, the way the data are interpreted. Often the debate is that without reliable data, it is impossible to analyze BE and its impact on the economy. However, even if there is little or no data about BE, this doesn't mean we cannot discuss it or try to measure and define it.

Black economy (BE) in this research refers to and combines the definitions of BE according to Faal (2003), Scheneider and Enste (2004), Yanagisawa (2011), Edelbacher (2015), and Kumar (2017), that is, any activity of production and distribution of goods and service, legal and illegal, whose value is not reflected in the official economy or PDRB with the purpose of tax evasion, government regulations, standard labor compliance (minimum wage, work hour, and work safety), and administrative and procedural obligation (such as permits, etc.).

What Drives Black Economy?

According to Scheneider and Enste (2004), the main reasons for BE to take place are as follows:

1. The low salary of bureaucracy and police departments as law enforcement agencies
2. The high rate of inflation and speculation
3. The high tax rate
4. The high level of control and regulation in society

Some analysts argue that the low salaries of bureaucrats such as police, judges, and all law enforcement authorities in developing countries resulted in the rise of BE. There's an opinion that because of the low salaries of these people, there's an urge to get extra money, and in the end, they use their position to ask for and receive bribes. Bribes are given by economic subjects who are close to stakeholders to obtain convenience or a more significant portion in controlling resources. They are deliberately allowed to do BE as long as their share of profits is routinely paid to stakeholders. The underlying idea of this theory is that there is

a demonstration effect from developed countries. Rulers in developing countries want the same lifestyle as their counterparts from developed countries. To achieve this standard, they must have a much higher income, so they try to get a sizable extra income beyond their official income, and this is where the practice of rent-seeking thrives.

How about the theory suggesting that high inflation and speculation also drive BE? Inflation and speculation result in higher revenue for the business in the short term, but in the long term, it will drop because the price increases, and it causes the goods and service sales to decrease. Business people will try to maintain their income by carrying out illegal activities. Extreme speculation, through violation of government regulations, when there's a loss, results in the formation of hidden income because it is connected to illegality. So the leading cause is illegality, not speculation. A consideration worth taking more seriously is a hypothesis that the high tax rate and strict regulations are the roots of BE creation.

Black Economy Measurement

Measuring BE value is an exciting yet challenging task. In the following, a comprehensive review will be presented to estimate it through the electricity consumption approach.

Kauffman and Kaliberda (1996) stated that electrical power consumption is the best physical indicator of the overall economic activities to measure the overall economic activities (formal and informal) in a given economic period. The overall economic activities (formal and informal) and electricity consumption move simultaneously globally, with the value of electricity consumption elasticity/GDP usually approaching one.

$$\varepsilon_t = \frac{e_0}{gdp_0} = \frac{e_1}{gdp_1} = ... = \frac{e_t}{gdp_t} .... = \frac{e_n}{gdp} = \approx 1$$

Where ε represents the value of electricity consumption elasticity which shows the fluctuations (increase and decrease) of the electricity consumption (e) as a result of the fluctuations (increase and decrease) of GDP.

Kauffman and Kaliberda stated that the total electricity consumption growth indicates GDP growth. According to this approach, the fluctuations in GDP and total electricity consumption level can be connected to the growth of the black economy. The method is straightforward and exciting, yet still open for criticism:

1. Not all black economy activities require a significant amount of electricity (such as personal services), and other sources of energy can be used (gas, oil, coal, etc.). So, once again, only a part of the black economy can be covered by this method.
2. Through the years, significant technical improvement has taken place. Electricity production and consumption are more efficient than before, and it applies to official and unofficial usage.
3. There might be a big difference in fluctuations of electricity elasticity/PDB for different countries from time to time.

Data and Research Method

Econometric Procedures to Measure the Quantity of Black Economy

Calculating Base Year Black Economy (BE)

The quantity of base year black economy (X) can be determined by the original local government revenue potential approach. Improvisation of the model suggested by Basirat (2014) and Sinaga (2020) results in an original local government revenue (PAD) model, where PAD is affected by the gross regional domestic product (PDRB) and total population (P).

The steps to calculate the value of the black economy are as follows:

a) Estimating the original local government revenue by the following equation:

$$\ln PAD_t = \alpha_0 + \alpha_1 \ln PDRB_t + \alpha_2 \ln P_t + e_t \quad (3.1)$$

Where:

PAD_t = total original local government revenue of the year 2010q1-2021q4

$PDRB_t$ = Gross Regional Domestic Product (PDRB) of the year 2010q1-2021q4

P_t = total population of the year 2010q1-2021q4

e_t = *error term*

b) Calculating the realization of the original local government revenue by the following equation:

Realization of the Original Local Government Revenue = Total Tax and Retribution Revenue from various sectors in a given economic period (3.2)

c) Calculating the potential of the original local government revenue by the following equation:

The potential of the Original Local Government Revenue = Estimated Original Local Government Revenue - Realization of the Original Local Government Revenue (3.3)

Black Economy (BE) Calculation with Electricity Consumption Approach

Electricity consumption approach by Kaufmann and Kaliberda (1996) and improved by Kyle and Waren (2011):

a) Assuming that the proportion of Energy (E) to total economic activities (TA) is constant, then:

$$TA_n = E_n \times \frac{TA_{base}}{E_{base}} \quad (3.4)$$

So That:

$$TA = \frac{TA-Y}{Y} = \frac{TA}{Y-1}$$

Where Y = Gross Regional Domestic Product (PDRB), BEbase = x fraction of black economy from base year GDP, then:

$$TA_{base} = Y_{base}(1+x) \quad (3.5)$$

$$TA_n = E_n \times \frac{Y_{base}(1+x)}{E_{base}} = (1+x) \times \frac{Y_{base} \times E_n}{E_{base}}$$

So the formula to measure the black economy in research year BEn is as follows:

$$UE_n = TA_n - OE_n \quad (3.6)$$

Where:

BE = Black economy of the year 2010-2021

OE = Official economy (GDP) of the year 2010-2021

TA = Total economic activities (OE + BE) of the year 2010-2021

Y_{base} = Gross Regional Domestic Product (PDRB) of the base year

Y_n = Gross Regional Domestic Product (PDRB) of the research year

E_{base} = Total electricity consumption of the base year

E_n = Total electricity consumption of the research year

x = Black economy of the base year (2010)

Mapping Procedures of the Black Economy Indicated Activity Types

The mapping procedures of the types of black economy indicated economic activities in four regencies in Madura Island include:

1. Data Collection Techniques

Data collection techniques are the most strategic steps in research, as the main objective is to collect the data. The data collection techniques used in this research include observation, interview, and documentation.

a) Observation

Observation is conducted by collecting data directly from the field. The observation process is done by identifying the areas to be observed. To observe this research, researchers go straight to the research locations. This observation technique obtains accurate data to get the most relevant results.

b) Interview

An interview is a form of direct communication between researchers and respondents. The researchers conduct the interviews by making direct conversations with members of society, business owners, regional government, and electrical energy suppliers (PLN, the State Electricity Company) in four regencies in Madura Island. All informants are critical in this research because they are the primary data source.

c) Documentation

Documentation is a data collection technique in which the data are obtained from documents. This technique collects data from sources such as books and journals related to the research priorities. The collected documents are used to enrich the research analysis.

2. Informant Selection Technique

In this research, informants were selected using a technique called purposive sampling. The purposive sampling technique is an informant selection technique where the informants are predetermined according to specific considerations or purposes, making it easier for the researchers to explore an object or situation under research and obtain the desired data.

3. Informant Criteria

Informants in this research are those who can give detailed data and information

following the purpose of the undergoing research. In this research, the informants comprise society representatives, business owners (economic agents), local government officials, and PLN (The State Electricity Company) employees.

4. Data Analysis Techniques

Data in this research are analyzed using interactive model data analysis with three components: data reduction, data display, and conclusion drawing. The details can be described as follows:

a) Data Reduction

Data collected through various techniques such as interviews, observation, and documentation will then be sorted to reduce the amount. The reduced data will show a clearer picture and will facilitate the researchers to collect further information.

b) Data Display

The data in this research are presented in narrative forms. They can be displayed in various types, such as pictures, tables, and charts, that help the researchers to conclude and describe the obtained information.

c) Conclusion Drawing

The final data analysis is the conclusion drawn. The conclusion is made using the data collection results from the beginning to the end of the research. This is the step where the research ends, as all the data needed are already collected and will be used to conclude. The conclusion is drawn when the research has enough data to understand the result of the process.

5. Data Validity Check

The triangulation technique used in this research to verify the data validity is among the information sources involved in the data collection. Triangulation is a data validity check technique done by cross-checking the data given by one informant to another so the obtained final data are valid and ready to use.

Result and Analysis

The Quantity of Black Economy in Madura

The quantity of black economy in Madura (Sumenep, Pamekasan, Sampang, and Bangkalan) can be shown as follows:

1. Sumenep Regency

The calculation of the black economy on model 3.5 that is performed from 2017 to 2021 results in the estimated original local government revenue model as follows:

Table 1: Model Calculation Result of Black Economy Using Electricity Consumption Approach in Sumenep Regency

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2017	30546237.90	2570354.68	42805841.84	0.40
2018	32703554.20	2774050.20	47637266.96	0.46
2019	33298636.50	2974121.76	50664904.66	0.52

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2020	*32750242.10*	*3503793.75*	*56685774.84*	*0.73*
2021	35187838.00	3622365.71	48925595.77	0.39

Table 1 shows that the quantity of black economy in Sumenep Regency from 2017 to 2021 fluctuated from 39% to 73%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 39% to 73%. The highest PDRB potential was 73% in 2020 when the global COVID-19 Pandemic and Indonesia reached its highest peak. Tax relaxation programs and the restriction on formal economic activities motivated the society to move to informal activities where the black economy often took place.

2. Pamekasan Regency

The calculation of the black economy on model 3.5 that is performed from 2017 to 2021 results in the estimated original local government revenue model as follows:

Table 2: Model Calculation Result of Black Economy Using Electricity Consumption Approach in Pamekasan Regency

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2017	14620576.00	387245.23	19404382.22	0.33
2018	15912846.00	415424.58	22115140.74	0.39
2019	17028502.80	446790.04	24131164.16	0.42
2020	*16793847.00*	*532658.03*	*28624675.53*	*0.70*
2021	18080631.00	538628.57	23944744.75	0.32

Table 2 shows that the quantity of black economy in Pamekasan Regency from 2017 to 2021 fluctuated from 33% to 70%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 33% to 70%. The highest PDRB potential was 70% in 2020 when the global COVID-19 Pandemic and Indonesia reached its highest peak. Tax relaxation programs and the restriction on formal economic activities motivated the society to move to informal activities where the black economy often took place.

3. Sampang Regency

The calculation of the black economy on model 3.5 that is performed from 2017 to 2021 results in the estimated original local government revenue model as follows:

Table 3: Model Calculation Result of Black Economy Using Electricity Consumption Approach in Sampang Regency

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2017	17619499.54	308019.86	20493852.26	0.16
2018	19105375.54	347293.50	24335910.04	0.27
2019	19788732.21	355322.15	23945135.47	0.21

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2020	*19642573.38*	*429177.25*	*29279824.29*	*0.49*
2021	20032057.01	436784.23	24488643.47	0.22

Table 3 shows that the quantity of black economy in Pamekasan Regency from 2017 to 2021 fluctuated from 16% to 49%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 16% to 49%. The highest PDRB potential was 49% in 2020 when the global COVID-19 Pandemic and Indonesia reached its highest peak. Tax relaxation programs and the restriction on formal economic activities motivated the society to move to informal activities where the black economy often took place.

4. Bangkalan Regency

The calculation of the black economy on model 3.5 that is performed from 2017 to 2021 results in the estimated original local government revenue model as follows:

Table 4: Model Calculation Result of Black Economy Using Electricity Consumption Approach in Bangkalan Regency

Year	PDRB (Official Economy/OE)	Electricity Consumption	Total Activity (TA)	Black Economy (BE = TA - OE)
2017	21654591.44	442391.31	27454496.76	0.27
2018	23846656.10	476744.47	31293767.14	0.31
2019	24664205.21	506661.79	33985116.11	0.38
2020	*23290005.86*	*570197.14*	*37222264.06*	*0.60*
2021	24664642.11	588128.95	32214092.49	0.31

From Table 4, we can see that the quantity of black economy in Pamekasan Regency from 2017 to 2021 fluctuated in the range of 27% to 60%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 27% to 60%. The highest PDRB potential was 60% in 2020 when the global COVID-19 Pandemic Tax relaxation programs and the restriction on formal economic activities motivated the society to move to informal activities where the black economy often took place.

Overall, the black economy activities in Madura (Sumenep, Pamekasan, Sampang, and Bangkalan) are almost equivalent to the black economy activities in Indonesia, with a value as significant as 40% of the Gross Domestic Product (GDP). The highest activities took place in Sumenep Regency with an average value of 50% and the lowest activities took place in Sampang Regency with an average of 27%.

Types of Black Economy-Indicated Economic Activities in Madura

Black economy (BE), as defined by Faal (2003), Scheider & Enste (2004), Yanagisawa (2011), Edelbacher (2015), and Kumar (2017), is any activity of production and distribution of goods and services, legal as well as illegal, where the amount is not reflected in official economy or GDP to avoid tax liability, government regulations, labor standards compliance (minimum wage, work hour, and work safety), and administrative and procedural obligations (licensing, etc.). The types of the black economy according to the areas are described as follows:

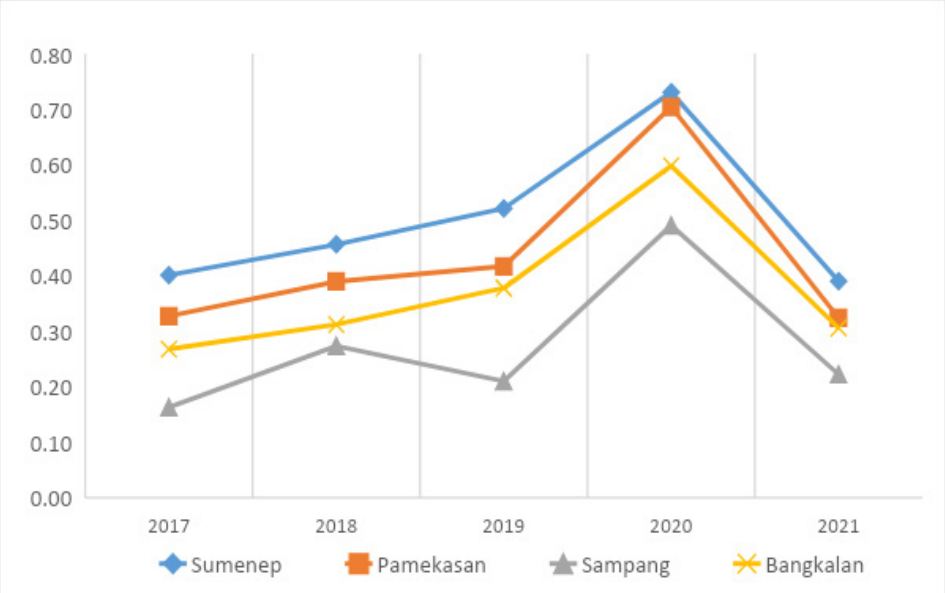

Figure 1: Black Economy Fluctuation in Madura

1. Sumenep Regency

The black economy indicated economic activities in Sumenep Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 19%. Bicycle and motorbike workshops, hair and beauty salon, and private course contribute a reasonably significant amount (>10%) to the total black economy activities in Sumenep Regency.

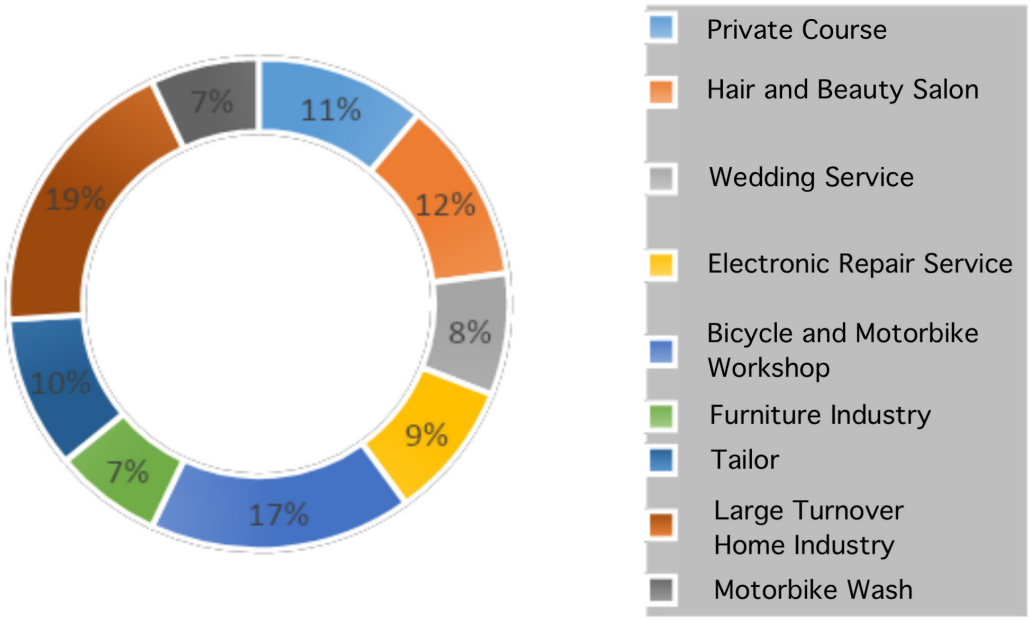

Figure 2: Black Economy in Sumenep Regency

2. Pamekasan Regency

The black economy indicated economic activities in Pamekasan Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 16%. Hair and beauty salons, the duty-free cigarette industry, and tailor contribute a reasonably significant amount (>10%) to the total black economy activities in Pamekasan Regency.

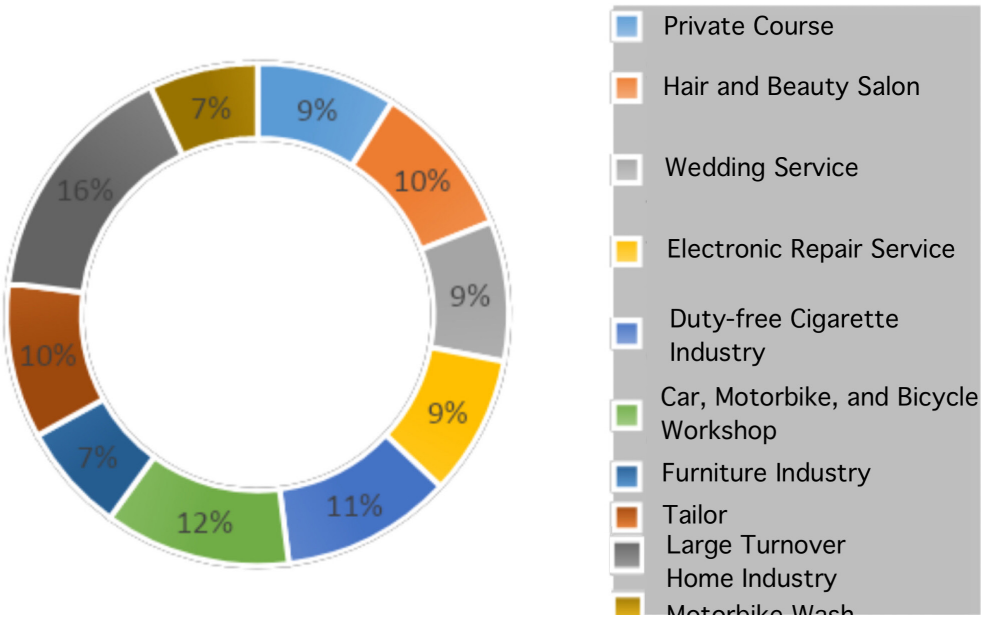

Figure 3: Black Economy in Pamekasan Regency

3. Sampang Regency

The black economy indicated economic activities in Sampang Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 18%. Bicycle and motorbike workshops, electronic repair services, and the furniture industry contribute a reasonably significant amount (>10%) to the total black economy activities in Sampang Regency.

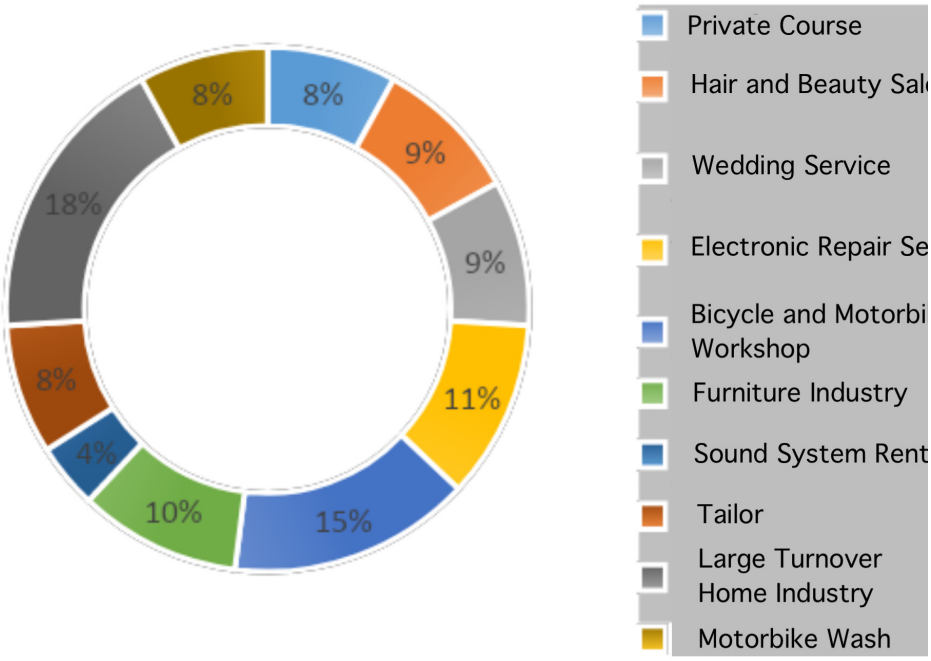

Figure 4: Black Economy in Sampang Regency

4. Bangkalan Regency

The black economy indicated economic activities in Bangkalan Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 18%. Bicycle and motorbike workshops, electronic repair services, and wedding services contribute a reasonably significant amount (>10%) to the total black economy activities in Bangkalan Regency.

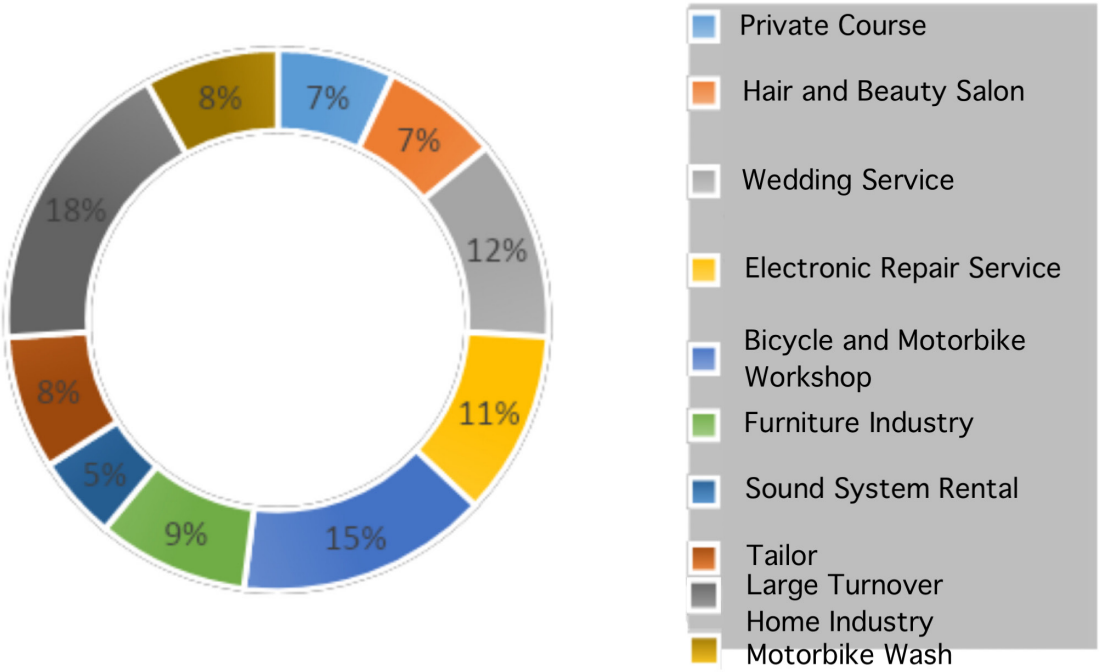

Figure 5: Black Economy in Bangkalan Regency

Conclusion

According to the estimated results and study described in the previous sections, a few conclusions can be drawn as follows:

1. The calculation result of the black economy in Sumenep Regency from 2017 to 2021 fluctuates from 39% to 73%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 39% to 73%. The black economy indicated economic activities in Sumenep Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 19%. Bicycle and motorbike workshops, hair and beauty salon, and private course contribute a reasonably significant amount (>10%) to the total black economy activities in Sumenep Regency.
2. The calculation result of the black economy in Pamekasan Regency from 2017 to 2021 fluctuates from 33% to 70%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 33% to 70%. The black economy indicated economic activities in Pamekasan Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 16%. Hair and beauty salons, the duty-free cigarette industry, and tailor contribute a reasonably significant amount (>10%) to the total black economy activities in Pamekasan Regency.
3. The calculation result of the black economy in Sampang Regency from 2017 to 2021 fluctuates from 16% to 49%. This shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 16%

to 49%. The black economy indicated economic activities in Sampang Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 18%. Bicycle and motorbike workshops, electronic repair services, and the furniture industry contribute a reasonably significant amount (>10%) to the total black economy activities in Sampang Regency.

4. The calculation result of the black economy in Bangkalan Regency from 2017 to 2021 fluctuates in the range of 27% to 60%. This number shows a potential in Gross Regional Domestic Product (PDRB) that should be included in the PDRB calculation system from 27% to 60%. The black economy indicated economic activities in Bangkalan Regency are dominated by a large turnover home industry (turnover > Rp 50.000.000) with a value of 18%. Bicycle and motorbike workshops, electronic repair services, and wedding services contribute a reasonably significant amount (>10%) to the total black economy activities in Bangkalan Regency.

Declarations

Declaration include Conflict of Interest, Availability of Data and Materials, Author'sContrubution, Funding Sources, and Acknoledgements.

Conflict of Interests

There are no conflicts of interest.

Availability of Data and Materials

Data available on request.

Author's Contribution

All: conceptualization, data curation, formal analysis, writing-original draft, and writing review and editing.

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