

# Measurement of the Non-Observed Economy in Mongolia

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## 1. Background

Similar to other countries, the National Statistical Office of Mongolia (NSO) has implemented a number of projects to reflect the activities of informal sector in the national economy to the GDP estimation step by step.

Since 1997, estimations of the size of the non-observed economy have been carried out with the support of international organizations. The first survey was conducted in 1999 under the recommendations of the World Bank consultant Mr. Bill Bikales and the informal activities in retail trade sector (kiosk, small retailers operating in streets and markets), transportation (taxi drivers), and food services were added to the official GDP of 2000 for the first time. Since then, the value added of informal sector was estimated by extrapolation on the basis of CPI changes and number of people working with licenses.

The operators who have undeterminable income that is not required to report to the tax authority were covered in the Establishment Census of Mongolia, which was conducted in 2006 and a database of their activities was created. Based on the census results, the activities of those operators were classified by the types of economic activities and their output was reflected to the estimation of GDP of 2006. Also, the previous years' calculations were updated according to the census results.

For the first time, the NSO has estimated the size of non-observed economy in the frameworks of N1-N7 applying the "Handbook for Measurement of the Non-observed Economy, 2002" and the "System of National Accounts, 2008".

Within the framework of the estimation of the non-observed economy of Mongolia, the NSO carried out a number of surveys and calculations. The Survey of the Household Unincorporated Enterprises producing for the Market (HUEMs) was conducted in 2012 at the national level and the survey results were used to determine the total production of informal sector. In addition, the other frameworks of non-observed activities, such as illegal and underground productions were estimated on an annual basis using the associated administrative data sources.

## 2. Conceptual Framework of the Non-observed Economy

The non-observed economy (NOE) refers to all activities that may not be captured in the basic data sources used for national accounts compilation. The following activities are included: underground, illegal, informal, production by household for their own final use, and other activities omitted due to deficiencies in the basic data collection programme. The term 'non-observed economy' encompasses all of these activities and the related statistical estimation problems. The measuring the non-observed economy means that these activities are covered in the system of national account.

Four main indirect methods or approaches are

therefore used here to measure the NOE. These are: (a) the GDP approach, where the discrepancy between national expenditure and income statistics is calculated; (b) the monetary approach; (c) the estimates on electricity consumption approach; and (d) labor input approach based on productivity.

(a) With regard to the first approach, it is to be noted that the usual estimation of GDP may be based on either production, expenditure or income measures. In the national accounting system, all three measures should yield the same aggregates. However, the existence of the NOE may cause discrepancies among the three and make the income (and production) measure of GDP the highest. As such, the discrepancy between an independent production measure of GDP and an independent expenditure measure of GDP can be used as an indicator in measuring extent of the NOE.

(b) Meanwhile, the second approach - the monetary approach - consists of a simple currency ratio method (SCR), the transaction advanced method and currency demand method.

The SCR method basically assumes that all payment transactions in the NOE are realized by using only cash or currency. The SCR method depends on this comparative advantage and based on other assumptions such as (a) the ratio of currency to demand deposits remaining constant except for changes induced by the growth of unreported income, and (b) the income velocity of money being the same in the NOE and in the (official) registered economy, the SCR is able to compute for and determine the size of the NOE by using known parameters of the economy.

The transaction advanced method, on the other hand, assumes the existence of a constant relation over time between the volume of transactions and the official GDP. Relating total nominal GDP to total transactions, one can calculate the GDP of the NOE by subtracting the official GDP from the total nominal GDP.

For the currency demand method, a fundamental reason found to cause the existence of the NOE is the tax burden, such as high tax rates. The main point of the approach is that the shadow economy is nonexistent, when tax rate is zero. The assumption is that velocity of money in the shadow economy is the same as in the official economy

**Table 1 Models based on Different Indicators**

		Price index		Note
		CPI	GDP deflator	
Interest rate	Deposit rate	1-1	1-3	Based on the indicators four different estimation possibilities can be created at the regression equation.
	Loan rate	1-2	1-4	

and computing for a currency demand equation to determine the excess demand part of the money demand (which is assumed to grow as the NOE expands) helps estimate size of the NOE.

(c) The third indirect approach employed by the study - the electricity consumption approach - suggests that the growth of total electricity consumption is an indicator for representing a growth of both the official and unofficial GDP. The difference between the gross rate of registered (official) GDP and the gross rate of total electricity consumption may be attributed to the growth of the NOE.

(d) Finally, the main idea of the fourth approach is that the not-working population (those worked possibly) is working in shadow economy with the same productivity of the official economy.

An analytical framework needs to provide a finer breakdown, incorporating additional characteristics of the non-observed activities. The characteristics by which the non-observed activities may be subdivided into 7 groups (N1-N7) as described in Table 2.

**Table 2 The N1-N7 Framework of the Non-observed Economy**

Classification of the NOE	Framework
1. Underground production	N6 - Producers deliberately misreporting
2. Illegal production (drugs, prostitution etc)	N2 - Producers deliberately not registering - illegal
3. Informal sector production	N1 - Producers deliberately not registering - underground N5 - Registered entrepreneurs not surveyed
4. Household production for own final use	N3 - Producers not required to register
5. Other missed productive activities	N4 - Legal persons not surveyed N7 - Other statistical deficiencies

**3. Related Survey Estimation and Results**

The NSO conducted the following surveys in accordance with the international framework (N1-N7) of the non-observed economy.

1. Survey of household unincorporated enterprises producing for the market;
2. Survey on Experts opinion of intentional distortion of business accounting;
3. Estimation of illegal production.

For estimation of the non-observed economy, several data sources of different periods were used and additional calculations were made in order to have the same base. The survey and estimation periods were as follow:

1. The NUEMs were conducted in the third and fourth quarters of 2012 and it covered 2011 data. The survey on artisanal mining was conducted in the second half of 2012 and it covered 2011 data.

2. The assessments and estimations of legal entities that hide their business income were made on the basis of 2010 data source.
3. The estimation of illegal activities was based on 2010 data.

According to the "Statistical Law" of Mongolia, we measured the size of non-observed economy into 2010 and made the associated calculations in order to use them for the Supply and Use Table /SUT/ and Input and Output table /IOT/ of 2010.

**1. Household Unincorporated Enterprise for the Markets (HUEMs)**

The sampling of the Survey on Household unincorporated enterprises for the market (HUEMs) was based on the sampling of the Labor Force Survey /LFS/ and it was covered by the following criteria illustrated in Figure 1.

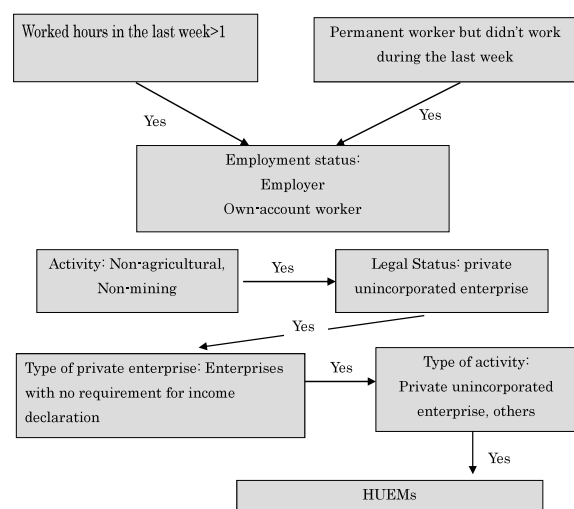
The sampling frame was prepared by aimags (provinces), the capital city, soum<sup>1</sup>, districts, bags<sup>2</sup> and khoroo<sup>3</sup> based on population data and housing census at the end 2010.

The estimated sample size complies with survey budget. The sampling design with an error probability did not exceed 4 percent at the national level and the design sampling effect did not exceed 1.5 percent. Sampling of the LFS covered 12,820 HUEMs; and the Survey on Household Unincorporated Enterprises producing for Market that was conducted by the National Statistical Office of Mongolia covered about 3,008 HUEMs.

We took khoroo<sup>s</sup> of all districts of the Ulaanbaatar city and bags of aimags as Primary Sampling Unit (PSU). The secondary sampling units (SSU) were households.

We collected information on activities of the HUEM, duration of engaging in business, type and condition of the place of business; ownership and registration of the business; keep a financial record; selling or bartering some goods and services on the market.

**Figure 1 Flowchart for Identifying HUEMs from Units Covered by the LFS**



<sup>1</sup> Administrative division of aimags

<sup>2</sup> The smallest administrative division of soums

<sup>3</sup> The smallest administrative division of districts

According to the survey results, there were 163,600 HUEMs conducting industrial, trade and service activities, of which 129,500 units or 79.1% were working in urban areas and 34,100 units or 20.9% working in rural areas. Among the surveyed HUEMs, 18.2% were carrying out industrial activity, 8.0% had construction activity, 44% had trade activity, and 29.8% were engaged in other service activities. The majority of other service activities were transportation that accounted for 66.1% of total.

In terms of the number of household member of the boss and operators of the HUEMs, 10.1% of total had 1-2 household members, 20.6% had 3 household members, 33.1% had 4 household members, 22.6% had 5 household members, and the other 13.5% had 6 and more household members. Accordingly, the HUEMs were providing living sources for almost 700,000 people, whereas 95.9% of total HUEMs were carrying out this business as their primary activity and only 4.1% of them were carrying out this business as their secondary activity. In the manufacture sector, the HUEMs of secondary activity were the highest and accounted for 2,620.

One of the main indicators that show economic sustainability and coverage is the availability of professional premises. 49.1% of all HUEMs were working without professional premises or in streets, improvised post on the road, garbage area, and at the customer's home or in his/her own home. But 50.9% of all HUEMs were working at their professional premises or in shops, public markets and restaurants etc.

209,900 persons worked in the HUEMs, whereas 68% of them were own-account workers, 16.6% wage earners, 9.9% boss/employers, 4.6% unpaid family workers, 0.7% partner workers and 0.2% paid apprentices.

According to the survey results, the HUEMs made

sales of MNT 2,799.2 billion annually. 68.2% of total sales of the HUEMs were generated from wholesale, retail trade and repair of motor vehicles and motorcycles, 15.2% - in transportation and storage activities, 6.8% - in manufacturing activity, 3.7% - in construction activity, 2.5% - in accommodation and food service activities, and the other 3.6% from other activities.

Also, the value added of the HUEMs was MNT 1,018.6 billion annually. Industrial activity contributed to 17.2% of total value added, while trade activity and other service activities were responsible for 54.9% and 17.9% of total respectively. Moreover, in 2011, the artisanal miners produced MNT 19,806.1 million of gross value added and spent MNT 5,583.6 million the intermediate consumption (Table 3).

## 2. Illegal Production

The illegal production shows the N2 framework of the non-observed economy and it is divided into the following 2 categories by their activity type that:

- Produces, transports, sell, stores and transfers to others the goods and services which are illegal;
- Runs the activities illegally or without permissions even though the activities are legally accepted.

The illegal activities, such as drug trade, smuggling of goods and prostitutions which are negotiated between the two sides of the retailers and purchasers are included in the production boundaries. But the other illegal activities, such as robberies which are not negotiated between the two sides, are excluded from the production boundaries. Therefore, the illegal activities that are not negotiated between the two sides are defined as the special type of external factor and their values are not included in the national accounts. The drug trade and prostitutions, which were dominated in the illegal activities, were included in the current estimations.

*Drug trade and consumption:* The calculations of the drug trade were made based on the associated information and surveys from police organizations and some administrative data of the Customs Office and health organizations.

*Prostitution:* Several surveys conducted by the NSO and other organizations were used in the data source of calculating the prostitution activities. For instance, NSO conducted a "Survey on Sex workers and Sexually Exploited Children" in 2010. The estimations were made based on information such as, the total number of prostitutes, the number of prostitutes who serve foreigners, and their monthly average income.

## 3. Underground Production

The underground production represents the N6 framework of the non-observed economy. These are the goods and services that are produced legally, but misreported in the official statistics due to several reasons as follow:

- To avoid income, value added and other taxes;
- To avoid social security contributions;
- To avoid adhering the statutory standards (for example, to evade to adhere to the minimum wage, maximum working time, labor safety and the hygienic standards);

**Table 3 Annual Gross Outputs Intermediate Consumption and Value-Added by ISIC**

Economic activity	Gross output (mln.tog)	Intermediate consumption (Million MNT)	Value added (Million MNT)	Value added per HUEM ('1,000 MNT)	Percentage of the total value added of HUEMs by ISIC
Total	1,663,925.0	645,359.1	1,018,565.9	6,224.6	100.0
Manufacturing	188,651.3	95,699.2	92,952.1	3,214.7	9.1
Water supply; sewerage, waste management and remediation activities	1,064.2	494.3	569.9	721.6	0.1
Constructions	104,405.5	22,818.1	81,587.4	6,240.7	8.0
Whole trade and retail trade; repair of motor vehicles and motorcycles	787,522.5	228,556.8	558,965.6	7,757.4	54.9
Transportation and storage	426,023.1	216,003.3	210,019.8	6,504.6	20.6
Accommodation and food service activities	64,601.4	35,274.8	29,326.6	7,998.1	2.9
Other services	91,656.9	46,512.5	45,144.4	3,513.5	4.4

Source: The Report on Measuring the Non-observed Economy 2010, NSO, 2013

d) To avoid the administrative rules and regulations (for example, evade the statistical questionnaires and administrative registration).

According to the recommendations of SNA-2008, the hidden or underground economy will cover the activities that evade the administrative regulations and duties and the felonious activities will be included in the illegal activities. For this estimation, the parts who avoid paying the taxes and social security contributions and hiding their incomes were covered.

In 2010, 35,276 establishments were carried out their activities, whereas tax inspections were made at 9,465 establishments. Those establishments were divided into several groups by their income interval. As a result, MNT 615.4 billion of underestimated output was estimated in 2010 and it was revealed that 48.6% of mining and quarrying production and 29.6% of trade sector's production were underestimated (Table 4).

**Table 4 Underground Production of Entities that Hide Business Income, 2010**

Sectors	Total Production (MNT Million)	Share of Total, %
Total	615,385.8	100.0
Agriculture	8,060.2	1.3
Mining and quarrying	299,119.6	48.6
Manufacturing	22,490.6	3.7
Electricity, gas and steam and air conditioning	1,454.2	0.2
Water supply; sewerage, waste management and remediation activities	1,443.4	0.2
Construction	35,991.3	5.8
Wholesale and retail trade; repair of motor vehicles and motorcycles	182,378.1	29.6
Transportation and storage	8,275.5	1.3
Accommodation and food service activities	10,190.4	1.7
Other	45,982.5	7.5

Source: The Report on Measuring the Non-observed Economy 2010, NSO, 2013

#### 4. Size of the Non-Observed Economy in Mongolia

We stated earlier, data sources for the estimation of the non-observed activities were of different periods. Therefore, we made additional calculations to transfer the HUEMs results that were conducted in 2011 into 2010. The estimations of illegal and underground production were made through direct method based on 2010 data.

In 2010, size of the non-observed economy of Mongolia was MNT 1,332.1 billion and its share of GDP was 13.7%. 50.9% of the non-observed economy accounted for informal sector's production, 46.2% for underground production, 2.1% for illegal production and the other 0.8% was used for the own final consumption (Table 5).

The size of NOE in construction sector accounted for 35.9% of total that was the highest rate among the industries. Also, this rate was 34.1% for the accommodation and food service activities, 28.8% for wholesale and retail trade, 22.1% for transportation and storage, 13.4% for

**Table 5 Size of the Non-Observed Economy in Mongolia, 2010 (MNT Million)**

Economic activity	Value Added of NOE	Informal Sector Production	Illegal Production	Household Production for Own Final Use	Underground Production
Total	1,332,093.1	678,505.7	27,178.0	11,023.6	615,385.8
Agriculture	8,060.2				8,060.2
Mining and quarrying	305,661.8	6,542.2			299,119.6
Manufacturing	84,089.5	61,598.9			2,2490.6
Electricity, gas, steam and air conditioning supply	1,454.2				1,454.2
Water supply; sewerage, waste management and remediation activities	2,230.2	768.8			1,443.4
Construction	82,511.7	39,292.1		7,228.3	35,991.3
Wholesale and retail trade; repair of motor vehicles and motorcycles	528,875.9	340,643.9	5,853.9		182,378.1
Transportation and storage	186,841.2	178,565.7			8,275.5
Accommodation and food service activities	28,266.1	18,075.7			10,190.4
Other services	104,102.3	33,000.4	21,324.1	3,795.3	45,982.5
Share of NOE	100.0	50.9	2.1	0.8	46.2

Source: The Report on Measuring the Non-observed Economy 2010, NSO, 2013

**Table 6 Share of the Non-Observed Economy of Total Economy in 2010**

Industries	NOE (MNT Million)	GDP (MNT Million)	Total Economy (NOE+GDP)	Share of NOE of Total Economy, %
Total	1,332,093.1	8,414,504.5	9,746,597.6	13.7
Agriculture	8,060.2	1,203,348.0	1,211,408.2	0.7
Mining and quarrying	305,661.8	1,981,970.1	2,287,631.9	13.4
Electricity, gas and air conditioning supply	1,454.2	174,302.8	175,757.0	0.8
Water supply; sewerage, waste remediation activities	2,230.2	33,051.7	35,281.9	6.3
Construction	82,511.7	147,178.0	229,689.7	35.9
Wholesale and retail trade; repair of motor vehicle and motorcycles	528,875.9	1,310,622.1	1,839,498.0	28.8
Transportation and storage	186,841.2	659,297.7	846,138.9	22.1
Accommodation	28,266.1	54,553.4	82,819.5	34.1
Other services	104,102.3	2,141,249.1	2,245,351.4	4.6

Source: The Report on Measuring the Non-observed Economy 2010, NSO, 2013

mining and quarrying sector 10.6% for the manufacturing. In terms of the NOE composition, wholesale and retail trade accounted for 39.7% of total, while those of

manufacturing, transportation and storage, construction, accommodation and food service activities were 30.1%, 14.0%, 6.2% and 2.1% respectively. The remaining 7.9% of the NOE accounted for the other sectors (Table 6).

### 5. Summary and Recommendation

In order to conduct this survey, the informative issues of the previous surveys were revised and all the main frameworks of the non-observed activities were covered. Thus, it can be said that this survey was more advanced than the others. Based on the HUEMs, estimation of illegal production and assessments of the entities, which hide their incomes were carried out and the results were combined in order to estimate size of the non-observed activities.

It was estimated that the size of non-observed economy of Mongolia reached MNT 1,332.1 billion in 2010 and it accounted for 13.7% of GDP, whereas 50.9% of the non-observed economy was the informal sector's production and the underground production accounted for 46.2% of total, while those of the illegal production and own final consumption were 2.1% and 0.8% respectively.

Hereafter, the HUEMs should be conducted every 5 years. Thus, value added of the informal sector in the intermediate years can be calculated based on the previous survey results and the number of units identified by the

LFS. Also, it became possible to estimate size of other non-observed activities annually. At the same time, this study recommends the need for simultaneous use of the electricity consumption approach and monetary approach as well for better estimating the Mongolian NOE.

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## モンゴルの未観測経済の計測

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### 要旨

モンゴル国家統計局は、他国同様、国内経済の非公式部門における活動をGDP推計に反映させるため、着実に多くの事業を実施している。モンゴルの未観測経済推定の枠組みの中で、NSOは調査・算定を何回か行った。2012年には、市場を形成する個人事業主（NEUM）の調査が国レベルで行われ、その結果は非公式部門の生産総額の決定に使われた。

さらに、非合法の地下生産などその他の未観測活動の枠組みも、関連する行政データを利用して年間ベースで推測した。

1. NEUMは2012年の第3、第4四半期に行われ、2011年のデータを含めた。採掘業調査は2012年後半に行われ、2011年のデータを含めた。
2. 事業所得を隠した法人に対する評価・推定は、2010年のデータを元に算出した。
3. 非合法活動は2010年のデータを元に算出した。

モンゴル「統計法」に従って、2010年の未観測経済規模を測定し、2010年の「供給使用表」や「産業連関表」の編集に適用した。2011年は、223,300人が非公式部門に従事し、そのうちの67%が自己勘定労働者であった。2010年までのモンゴルの未観測経済規模は13,321億トゥグルグで、経済全体の13.7%を占めた。未観測経済の50.9%が非公式部門の生産、46.2%が地下生産、2.1%が非合法生産、0.8%が自己最終消費であった。

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