



Using a pseudo mixed survey to measure informal sector: the case of Senegal

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Abstract

The informal sector plays an important role in terms of creating income and employment in the economies of sub-Saharan Africa, particularly in Senegal. However, its integration in the national accounts often faces a problem of data unavailability. To overcome this constraint, the National Agency of Statistics and Demography (ANSD) has conducted in 2011 a national survey on the informal sector in Senegal (NSIS). This paper outlines the process used to achieve this operation. Subsequently, it analyzes the contributions and limitations of this survey for the inclusion of the informal sector in the national accounts. Recommendations are then made to make more efficient the future collection operations.

The paper notes that the approach to achieve NSIS draws mixed survey with two phases (Phase 1: employment survey to identify the heads of informal production units, Phase 2: survey on informal production units (IPU)). However, given the availability of results from the Poverty and Family Structure Survey (PFSS 2006) which have covered the employment components, ANSD wanted to use this operation to make budget savings in the costs associated with the completion of Phase 1. But, because of the lag between the moments of realization of the PFSS surveys and NSIS and the risk of not finding the IPU identified in the NSIS, the quota method was used in order to draw IPU in different branches of activity. The results of the NSIS were used to distribute the overall sample size, previously fixed according to the budget available, to each activity.

This survey has collected economic data on informal enterprises according to classification of activities in PFSS. These data were used to compile production and generation of income accounts of the informal sector by activity. They were also used to assess the employed population in the non-agricultural informal sector and the value added per worker.

Nevertheless, this paper highlights that the use of NSIS results in the national accounts has faced a major problem related to the high level of grouping activities that do not comply with the desired detail for national accounts.

In this respect, it concludes that in the absence of a specific survey on employment, it is possible to rely on household surveys, often conducted as part of the measurement of poverty indicators to gross-up results of informal enterprises surveys. For this purpose, it is necessary to orient the questions on employment in household surveys and use classifications of activities that can facilitate exploitation of results for national accounts.

Keywords: informal sector; mixed survey; national accounts.

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1. INTRODUCTION

As in other countries in sub-Saharan Africa, the informal sector plays a very important role in terms of job and income creation in the Senegalese economy. As an illustration, the 1-2-3 survey conducted in the capital, Dakar, found that in this region alone, the non-agricultural informal sector has created a value added of 356.3 billion CFA francs in 2002, which is equal to 9.6% of Gross Domestic Product (GDP). At national level, the non-agricultural informal sector contribution to the GDP exceeds 30% according to estimates from the national accounts. However, these estimates are mainly based on the National survey of the informal sector conducted in 1996.

To better understand the current dynamics of the sector and have more recent data for the purposes of national accounts, the National Agency of Statistics and Demography (ANSD) has conducted, in 2011, a National Survey on Informal Sector in Senegal (NSIS). The data collected in this survey has focused on the 2010 financial year.

This paper describes the methodology used to conduct this survey, the main results and how the data collected were used to assess the economic operations of informal sector, as required by the System of National Accounts (SNA). Lessons are then learned and recommendations to guide better future collection operations on the informal sector are given.

2. SCOPE AND METHODOLOGY OF THE SURVEY (NSIS)

2.1. SCOPE OF THE SURVEY

According to the International Labor Office (ILO), the informal sector is a set of production units whose main objective is to create employment and income for the people concerned. These units are characterized by:

- a low level of organization;
- a little or no division between capital and labor as factors of production;
- a small size in terms of workers.

In practice, *the National Agency of Statistics and Demography (ANSD) of Senegal defines the informal sector as all units which are not registered in NINEA² or do not keep accounting obeying the standards of the West African Accounting System (SYSCOA)*. The NSIS focused on the informal production units engaged in non-agricultural activities in the broad sense (plant, animal, forestry and fisheries).

2.2. SAMPLING METHOD

The sampling method adopted draws nearer mixed surveys (households, enterprises) in two phases, developed by DIAL which consists in:

- administrating a questionnaire on employment to a sample of households; this phase identifies the heads of informal production units (IPU) in the surveyed households (Phase 1);
- selecting all or draw a sample of Heads of IPU previously identified during the first phase and administering a questionnaire on conditions of production and the economic performance of their IPU (Phase 2).

However, given the budgetary constraints and the availability of results from the Poverty and Family Structure Survey (PFSS 2006) conducted in 2006, ANSD wished to skip the phase 1. In this respect, the following approach was adopted to draw the sample of IPU.

- i. Using PFSS to identify the number of Head of IPU by region and activity

The Poverty and Family Structure Survey (2006 PFSS) had as its main objective the collection of data to calculate the level of poverty in Senegal, according to the family structure. However, it collects also data on the conditions of employment of the active population (employment section and domestic work). In this respect, the question about the "professional category" of household member was used to identify "employers in the informal sector" and "Non-agricultural self-employed workers". These two categories are considered Heads of IPU. Table 1, below, shows the distribution of IPU by activity.

² National Identification Number of Enterprises and Associations

Table 1: Distribution of IPU Activity

Activities	Informal Sector Employers	Non-agricultural self-employed workers	Total
Extraction	1 340	3 258	4 598
Manufacturing food products, beverages and tobacco	1 898	13 789	15 687
Other manufacturing industries	1 553	45 005	46 558
Water, electricity and gas	803	4 082	4 885
Construction and civil engineering	2 263	51 398	53 661
Trade	5 983	428 888	434 871
Restaurants and hotels	2 056	10 776	12 832
Transport and communications	6 537	30 567	37 104
Other services	7 017	156 690	163 707
Total	29 450	744 453	773 903

Source: calculation from the Poverty and Family Structure Survey in Senegal (2006 PFSS).

ii. Draw quotas by region and activity

Given the long lag between the periods of implementation of the 2006 PFSS and the National Survey on the Informal Sector in Senegal (NSIS 2011), it was not appropriate to draw the IPU directly from the base provided by the first survey. Indeed, the informal sector is characterized by instability in employment.

However, the information in the NSIS on the number of heads of IPU (Table 1) was used to determine the quotas to sample by region and activity. The initial sample was adjusted in order to survey a minimum of five (5) IPU by region and activity. Ultimately, 8722 IPU, distributed as shown in Table 2, were surveyed. The total number of surveyed IPU takes into account budgetary constraints.

Table 2: Distribution of the sample by IPU activity

Activities	Number of IPU
Extraction	166
Manufacturing food products, beverages and tobacco	932
Other manufacturing industries	1 602
Water, electricity and gas	138
Construction and civil engineering	1 139
Trade	2 170
Restaurants and hotels	166
Transport and communications	685
Other services	1 724
Total	8 722

Source: Calculation from the 2006 PFSS structure with some adjustments

iii. Extrapolation of data

With the quota method, the principle of probabilistic inference is replaced by the hypothesis that the sample constituting a photo-reduction of population, the conclusions obtained on the sample can be extrapolated to the whole population. Then, the mean estimator is equal to the average over the sample (Pascal ARDILLY, 2006, survey techniques, page 201).

With the notations below:

- B : the number of activities;
- R : the number of regions;
- $r \in \{1, \dots, R\}$ index of region ;
- $b \in \{1, \dots, B\}$ index of activity;
- N_{rb} : the number of IPU in the industry "b" in the region "r";
- n_{rb} : the number of IPU surveyed in the industry "b" in the region "r";
- VA_{rbi} : the added value of IPU « i » in region « r » and activity « b ».

The weight of every individual « i » of activity « b » in region « r » is given by :

$$w_{rb} = \frac{N_{rb}}{n_{rb}}$$

Then, value added of activity « b » in « r » region is :

$$VA_{rb} = w_{rb} * \sum_{i=1}^{n_{rb}} VA_{rbi}$$

The total value added³ of activity « b » is, thus, obtained by summing the estimated value added of the activity to all regions:

$$VA_b = \sum_{r=1}^R \sum_{i=1}^{n_{rb}} w_{rb} VA_{rbi}$$

3. DATA PROCESSING AND MAIN RESULTS

The collected data have been double entered in CS PRO to detect and correct some errors. The survey database correction was made by the Technical Committee that was set up within the ANSD for conducting the survey. The Committee also made various tabulations. The participation of national accountants on the committee work helped to ensure that the various economic transactions were processed according to the requirements of the SNA. By way of illustration, certain benefits in kind granted to employees have been restated as wage elements. Furthermore, the results of the NSIS confirmed the important role of the informal sector in creating jobs and added value for the Senegalese economy. Table 3 below provides some summary results:

Table 3: main economic aggregates of non-agricultural informal sector

Activities	million FCFA				Workers
	Production	Value added	Compensations of employees	Taxes on production	
Extraction	86 303	47 475	15 325	1 800	17 723
Manufacturing food products, beverages and tobacco	768 754	256 400	52 800	2 772	172 752
Other manufacturing industries	333 460	164 716	58 430	1 320	177 304
Water, electricity and gas	13 658	6 111	1 152	66	6 914
Construction and civil engineering	445 397	253 097	126 477	869	213 269
Trade	1 290 688	994 858	193 630	68 846	641 021
Restaurants and hotels	139 857	68 197	18 123	1 119	39 548
Transport and communications	336 081	177 716	38 107	25 333	77 606
Other services	921 667	686 305	257 029	9 308	714 439
Total	4 335 866	2 654 875	761 073	111 433	2 060 576

Source : ANSD, NSIS 2011

³ Other variables are estimated in the same way.

4. DATA INTEGRATION IN NATIONAL ACCOUNTS

The results of NSIS have not yet been incorporated into national accounts produced by ANSD. Nevertheless, their inclusion is planned during the implementation of the new base year of national accounts of Senegal (base 2014).

The use of System of National Accounts (SNA)'s definitions in order to determine the values of different variables (output, intermediate consumption, compensation of employees etc.) in NSIS will facilitate the integration of these data in the national accounts. In addition, ANSD has established an employment monitoring system (NSES⁴) that will permit to obtain annual data on numbers of employees in the informal sector from 2014.

Also, the results of the NSIS will be used to determine aggregates per worker in informal sector (VA per worker, compensation of employees per worker etc.) and these results will be extrapolated from 2014 using data from the NSES.

However, additional work is needed to establish the production and operating accounts of informal activities according to the nomenclature of activities of the national accounts. Indeed, NSIS retained the same types of activity as the household survey (PFSS 2006). But it is relatively aggregated compared to the activity classification of national accounts. For example, all food manufacturing activities were consolidated in NSIS while the nomenclature of national accounts disintegrates into thirteen (13) activities.

In order to do disaggregate data from the National Survey on Informal Sector, it is recommended to use the informal employment from the Labor force survey (National Survey on Employment in Senegal 2015).

5. CONCLUSION

Since poverty surveys are usually conducted more regularly than employment surveys, it would be wise to use them to obtain a basis for identifying the informal production units. However, for optimum use of these surveys, it is necessary to take certain precautions in their design. In particular, it is important to introduce questions that permit to:

- identify all employed people who lead an informal production unit (IPU) both in respect of their main job than as a secondary employment;
- determine the type of activity of the IPU in accordance with the level of detail required for the purposes of national accounts.

⁴ National Survey on Employment in Senegal

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