

Possible Thrusts and Directions of Statistical Research In The Philippine Statistical System¹

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ABSTRACT

In order to live up to its mandate of delivering quality statistical information to the public, the Philippine Statistical System has to conduct statistical research initiatives. This paper provides a list of potential research areas under three broad headings and a discussion of the respective settings of these possible research undertakings.

1. INTRODUCTION

The Philippine Statistical System (PSS) generates statistical information by compiling data from surveys, censuses and administrative records in order to describe the over-all level of socio-economic activity in the country. As defined in Executive Order No. 121 dated October 1, 1987, the PSS comprises five major statistical agencies – the National Statistical Coordination Board (NSCB), the National Statistics Office (NSO), the Bureau of Labor and Employment Statistics (BLES), the Bureau of Agricultural Statistics (BAS) and the Statistical Research and Training Center (SRTC) – together with the various statistical organizations and units at all administrative levels across government. The ultimate goal of the PSS is the efficient, effective, and proactive delivery of quality statistical information and services (NSCB, 1999). The regular production of official and designated statistics assists development planners and policy makers in crafting and monitoring policy plans and programs. For instance, the task of the current government to reduce poverty considerably in ten years assumes a sound methodology for the measurement of poverty vis-à-vis examining the impact of poverty reduction programs.

Although it is tempting to reduce statistical activities and research to a bare minimum in times of economic difficulties, good governance, however, necessitates information and access to information in order to ensure transparency and accountability. Consequently, it is essential for government to invest in official statistics and statistical research, and more so in times of economic difficulties. In this paper, we discuss some possible themes of statistical research initiatives that could be pursued by the PSS taking into consideration increasing statistical information requirements in socio-economic policy domains within the context of the information age. General themes of these research undertaking are along the lines of having quality programs in statistical offices and pursuing innovative research undertakings in data production, analysis and dissemination.

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2. DATA QUALITY ASSESSMENT AND/OR IMPROVEMENT

Quality programs and frameworks for assessing the quality of statistical outputs have been seriously considered in statistical offices worldwide (see, e.g. Cornish and Templeton, 2001 or Lee and Allen, 2001). These programs have been instituted in recognition of several dimensions of quality that are seen from the perspective of both data producers and users.

The statistical production process involves a wide terrain of methodological and statistical issues arising from coverage accuracy, non-response, measurement, processing, timeliness and relevance of data sources, which are chiefly, surveys, censuses and administrative records. Advances in information and communications technology have led to improvements in data access and distribution, and this, in turn, necessitates the highest standards in data quality and the use of total quality management (TQM) framework in PSS operations. (Oñate, 1997) While work toward this end has been initiated, with the NSO being recognized for its institutional commitment to quality, substantial work still remains toward the full adoption of a quality management system at NSO and throughout the PSS, in general. This entails full documentation of the entire statistical production process, especially in operational matters related to data editing, checks, and imputations being carried out in the field and in data encoding.

While quality in generating official statistics generally refers to the reliability, accuracy, timeliness and efficiency of data, it also involves taking into account the methodological soundness of data generation and analysis, as well as how well the data satisfies particular needs and concerns of the users. One of the tasks in data quality is thus setting priorities so that supply of data matches demand for information.

Public trust for the PSS has been rather high owing to the independence and integrity associated with its operations and management. David (2001) even points out that the support of the Philippine government for statistical activities has even outpaced the situation in other neighboring countries. Despite this, there are growing concerns that stakeholders may be underutilizing the massive data being generated by the PSS, and this may lead to the downscaling of government support for statistical activities and operations.

Data users expect a number of information to be made available by the PSS, but the discrepancy between reported usefulness and actual use of data is believed by most stakeholders to be large. For instance, sub-national statistical information is being generated out of concern for local development planning, but there are questions on whether such information is truly factored into the planning equation. With the rising cost of generating information and the need to justify value for money, it is important to examine the extent of actual utilization of statistical information being generated by the PSS. Studies have to be made on actual use of information. Prototype material could also be developed that provide particular users, such as local development planners guidance on how official statistics may actually be used in their development planning. Studies regarding the construction of performance measurement indices in tax collection administration per sector that take into account the gross value added per sector, as in Papava (2001), could be undertaken.

Aside from examining the actual utilization of data, quality management in the PSS also entails full documentation of statistical operations and activities, including a discussion of the possible sources of errors arising in the generation of information. The initiation of the Statistical Survey Review and Clearance System (SSRCS) has led to the publication of a

systematic and comprehensive account of a number of survey and census operations, including even their sampling designs (NSCB, 2000). Unfortunately, this publication does not include quality profiles that document details potential sources of errors in these surveys and censuses, and how the error influences the uses of official statistics generated from these surveys and censuses. The development of quality profiles is essential as they bring about a thorough documentation of the whole survey process.

Statistical information is also sourced from administrative records. However, a systematic quality assessment of major administrative-based data has yet to be undertaken. Outliers have to be identified for major variables and if recorded data are spurious, these have to be rectified and cleansed. Documentation of the quality assessment has to be thoroughly made to guide future data generation endeavors. Quality assessed administrative records may then be subsequently used for other research purposes, e.g., measuring under-coverage in surveys and censuses.

Embarking on quality assessment may have its tradeoffs as they may lead the public into having less trust for the PSS, its products and services, but the experience in other countries shows that quality profiles provide data users a guide on the effects of possible errors in surveys, censuses and administrative records, as well as direct the training of future personnel in research and operations toward an improved generation of information (Lyberg, et al., 1998)

3. IMPROVEMENT OF THE GENERATION OF STATISTIC AND METHODS OF ANALYSIS FOR MEASURING SOCIO-ECONOMIC PERFORMANCE

Government development plans have been crafted using statistical information generated by the PSS. Programs and projects have been outlined so that various sectors complement each other in ensuring economic growth, which in turn is expected to generate stable employment and to result in reducing poverty. Such economic plans require a performance measurement system that provides clues on attaining the goals that have been set out. Plans have to be flexible to address circumstances not otherwise foreseen. Consequently, the PSS ought to continuously develop and improve the generation of statistics and methods of analysis for measuring socio-economic performance.

3.1. Measuring and Analyzing Poverty

The overarching goal of poverty reduction is contingent on properly counting and mapping the poor, which appear to be seemingly simple tasks. However, the methodological process of poverty measurement is actually contentious. In fact, no current international standard exists for counting the poor. The official system in the Philippines consists of firstly setting up regional urban-rural food per capita thresholds using food menus and vitamin requirements for households. Non-food expenditures of a reference household population within plus or minus 10 percent from the food thresholds are then used to obtain regional urban-rural poverty lines. Households with per capita incomes below the officially defined poverty lines are considered poor. There have been a number of concerns about the official poverty measurement system (see, e.g., David and Maligalig, 2001) and these issues have to be addressed to ensure that current and future poverty programs have minimal spoilage. Empirical studies on the efficacy of having a direct measurement of non-food components of the poverty line, the use of expenditure data over income data, the generation of mechanisms for identifying poor municipalities/barangays ought to be conducted as they will settle the issue of robustness and consistency of the current measurement system or whether changes actually ought to be instituted in this system.

3.2. Panel Data Analyses

Some households are common to a few major household surveys. Changes in socio-economic variables of these panel households may be helpful in providing policy planners explanations on the structural causes of poverty and directions to be taken regarding policy interventions. Few panel data analyses have been undertaken along these lines (see, e.g., Tabunda and Albert, 2002). Differential impacts of inflation on the poor and non-poor, the effectiveness of certain poverty program or even wage adjustment interventions may likewise be investigated in panel data studies.

3.3. Developing Quality Sub-National Statistics

In determining optimal resource allocation, quality sub-national statistics have to be generated. While censuses are the chief source of information for policy planning, they can be very expensive to conduct. Surveys, another source of information for policy planning, are much cheaper to conduct but their domains for some key indicators are at very high levels of aggregation, e.g. national, regional or provincial levels, and these may not be useful for development planning at the city/municipality or barangay levels. Direct estimates for small areas or subdomains based on surveys are not expected to yield reliable estimates. Small area estimation procedures, that roughly borrow information from similar small domains obtained from records in censuses, administrative records and surveys, have to be employed. These procedures increase the accuracy of estimates needed by planners and decision makers from local governments units. While some studies, e.g., Tabunda and Abanilla (1997), have already been started along these lines, institutional attempts within the PSS have yet to be fully undertaken.

The abundance of information within the PSS healthily allows for the possibility of linking the many sources of information. At times, there are key indicators that may be sourced from a number of surveys, censuses and administrative records. In such cases, a framework and system has to be set-up to integrate all the information resulting from these multiple sources. These involve determining definitional differences, record matching and discovering data inconsistencies and reconciling these differences. These may lead to construction of methodologies for developing small area estimates. (cf. Ambler, et.al., 2001).

3.4. Responding to the Changing World

The development of the Internet has revolutionized our ways of doing things. Business transactions through e-commerce are emerging more and more. Following the work of other countries (see Messenbourg and Atrostic, 2001), a conceptual reference framework and systems for measurement of e-commerce in relation to national accounts has to be developed. Basic statistical standards and analytical formats have to be reformulated that are based on matching quantitative and qualitative criteria for the changing world and the new economy.

Enhancements to processing systems, e.g. the System of National Accounts, have to be continuously developed since the changing times have led to more work yielding lag times in the release of full information from survey and administrative records, and determine the extent to which partial information may be used for imputing statistics in national accounts estimation. Concomitantly, other issues in improving the system of national accounts, such as the absence of a system for measuring capital stock data, updating Input-Output tables, estimation of transport and trade margins for supply and use tables and minimizing statistical discrepancies have to be addressed. The generation of financial statistics, especially toward understanding the flow of money, is also a problem that needs serious methodological attention.

Broader access to information has also emerged as a result of the Internet. Traditional data collection and dissemination strategies have thus to be reformulated in order to increase interaction between data producers, data users and other stakeholders. Current methods of estimating various statistics, such as price and production have likewise to be assessed and improved in the light of the dynamic state of economic affairs.

3.5. Monitoring Natural Resources, the Environment and Health Conditions

The monitoring of the country's natural resources and the assessment of the environment have also become serious concerns of the Philippine government, especially in line with the objective of ensuring development agendas. The estimation of air and water quality, wildlife counts (especially for endangered species), forestry and fishery stocks are among a few particular interests. These entail the development of area sampling and capture-recapture schemes and the subsequent mapping of various environmental statistics to provide policy makers information toward the development of proper policy actions. Likewise, in the area of health statistics, considerable improvements have to be made in developing an infrastructure for a reliable Health Information System that could provide policy planners effective programs that ensure the delivery of services to those who need them most.

4. INNOVATIONS IN DATA COLLECTION, PROCESSING, ANALYSIS, DISSEMINATION AND MAINTENANCE

Computing power has changed the ways in which data are gathered, processed and even analyzed. Item non-response in surveys and censuses may be reasonably handled through innovative computer simulations involving Bayesian statistical modeling, which result in dependable estimates of parameters. Complex designs for surveys may now be developed using information learned from past surveys. Data may also be geographically referenced and the resulting information may provide a strategy for obtaining less costly survey operations and even more reliable estimates. Various cutting-edge data mining and statistical tools have been developed and are now being used to uncover meaningful patterns in large data sets. In the PSS, the challenge is to use such innovations in the generation and analysis of statistical information.

4.1. Using New Technologies for Data Capture

Advances in information and communications technology (ICT) have resulted in the need for operational shifts in the way data and information are disseminated and maintained in the PSS in keeping with best practices of statistical agencies worldwide. Surveys and censuses may now involve not merely traditional face-to-face schemes, but also approaches involving telephones, cell phones and the internet. Operations for face-to-face surveys may likewise involve the use of other IT tools, e.g., hand-held computers for data capture. Such schemes not only minimize the use of paper, but also provide for the possibility of quick data capture and processing.

4.2. Geo-Referencing Data

Another particular promising area related to advances in ICT that has yet to be undertaken in the PSS is geo-referencing survey and census data. This would provide researchers the ability to do extensive spatial analysis (Cressie, 1993). Data from surveys and censuses actually carry an inherently spatial dimension. Low-income households tend to be closer to each other in spatial location; so do high-income households. Data thus are dependent to the extent that data coming from physical regions that are in close proximity are likely to be related. Geo-referencing data from surveys and censuses, and their subsequent data

management in a geographic information system helps to describe, estimate, analyze, and simulate spatial areas. This serves as an important concern for policy matters in order to develop geographic targeting, i.e. providing priority of services to those who need particular government programs and thus minimize wastage of scarce resources.

4.3. Updating/Developing Better Sampling Frames

Frames used for sampling operations, especially for surveys of establishment and enterprise inquiries, and for agricultural surveys are currently believed to be susceptible to the dynamic state of affairs in business and economics. Studies have to be made regarding strategies to update the frames of these types of surveys.

The generation of samples through the use of area frames rather than a list of frames is another concern that the PSS ought to look into particularly for the case of agricultural sample surveys. Currently, the conduct of agricultural surveys in the Philippines uses list frames that specify operators from past agricultural household surveys, censuses and other administrative sources. Area frames, which use the boundaries for the area of population covered by an agricultural survey, provide an alternative scheme for sampling agricultural dwellings and establishments. Development of area frames for agricultural surveys in the Philippines has yet to be performed. Once they are developed and used, results from the area frames and list frames have to be systematically integrated. A framework and system for such integration will then have to be developed.

4.4. Masking Meta Data

An issue that has yet to be addressed in establishment and enterprise surveys is finding the appropriate tradeoff between public access and confidentiality (cf. Fienberg, 2000). Data collected by the PSS cannot be disclosed readily without sacrificing matters that may be confidential, particularly for surveys of large business establishments and enterprises. Studies have to be made regarding the development of a disclosure limitation mask methodology in order to come up with public use files (PUFs) in establishment inquiries.

4.5. Dealing with Non-Response

A major problem in the course of conducting surveys and censuses, especially household censuses in highly urbanized areas, is having incomplete data arising from non-response, which takes two forms: unit non-response or item non-response. The former occurs when a survey or census unit, such as household in a household survey or census, does not respond or refuses to do so. In such cases, follow-ups may improve the response rate. Weighting adjustments are also made in such cases to compensate for this form of non-response. Sometimes, some data items are unspecified either because of item refusals, omissions by the interviewer, "don't know," and deleted answers during the editing phase of the data processing. In these cases, imputation methods are typically performed. Frontier-type imputation schemes, such as multiple imputation (Rubin, 1987), have yet to be tested against standard imputation schemes in order to find ways of improving the statistics that are generated from surveys and censuses. In the case of unit non-response, studies have to be made on the relationship of response rates to respondent selection as well as economic and political conditions, and on techniques for improving response rates, e.g. interviewer tactics and incentives.

5. FINAL WORDS AND ACKNOWLEDGMENT

The PSS has become respected and trusted not only by local stakeholders but also by its counterparts in other countries. However, this need not signify that the PSS ought to rest on its laurels. Much has to be done within the context of the changing world, and the exponentially increasing demands for statistical information. The compendium of topics and concerns listed in this paper are certainly not exhaustive but they represent a number of statistical research undertakings and exercises that ought to be supported in order to ensure that large quantities of data currently being generated by the PSS truly become meaningful and valuable. Efforts on re-engineering statistical agencies and statistical capacity building ought to ensure that the PSS internalize the need for statistical research undertakings and initiatives particularly involving data quality management and analysis.

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