SURINAME

SURINAME BUSINESS CLIMATE AND INNOVATION PROGRAM (SUBCIP) SU-L1049

ESTIMATING PRODUCTIVITY FROM PRIMARY INFORMATION

TERMS OF REFERENCE

1. BACKGROUND

Productivity estimates for Suriname suffer from significant shortcomings. First, available information allows for the estimation of labor, capital and total factor productivity only after making large assumptions about underlying data. Second, primary data at the macroeconomic and firm level are limited. Third, institutional capacity for the frequent estimation and analysis of productivity in the country is also limited.

Current estimates of productivity rest on information available in the World Penn Tables. The most recent estimates of total factor, labor and capital productivity prepared by C. Elias use total capital spending as a proxy for total stock of capital—the full report with the details of the estimation is available by request to CUS. This assumption, however, suffers from oversimplification: the information does not discriminate between changes in prices and real stocks (it provides the product of the two), which implies that the estimates may suffer from a bias as prices and stocks may not grow in the same direction or at the same rates; and the information is aggregated at the macroeconomic level and does not allow for measuring productivity for economic sectors, a major problem for prioritizing public policy. Because of potential problems, current estimates should be tested.

Moreover, primary data is not readily available at the macroeconomic level to resolve the problems embedded in the information provided by the World Penn Tables. The ABS does not collect gross domestic product by spending, therefore, the country does not have solid estimates of investment. In addition, the primary data collected at the firm level is insufficient to estimate productivity by sector or divided into capital, labor and total factor productivity—current primary information focuses instead on measuring the business climate.

Finally, weak institutional capacity hampers the ability to regularly produce estimates of productivity. Measuring productivity requires skills that are, currently, not fully available in the country. The Central Bank of Suriname would be the institution that could take the lead in the production and analysis of productivity, however, at this stage it is not empowered to do so.

This consultancy, therefore, is designed to address the first two short comings mentioned above. As it will be presented in the next sections, the consultancy will test assumptions about current productivity estimates, and collect primary data at the firm level specifically designed to estimate productivity at the sector level.

2. OBJECTIVE OF THE CONSULTANCY

2.1 The objective of the project is to improve and expand current productivity estimates (re the Technical Note on Productivity estimates for Suriname, Carlos Elias, August 2017) for Suriname using primary information.

3. MAIN ACTIVITIES OF THE CONSULTANCY

3.1 The project methodology includes four phases. The first phase tests the assumptions made for current estimates of productivity; the second phase collects all relevant secondary information and builds an accessible database; the third phase involves the collection of primary data through two enterprise surveys; and the fourth phase involved the analysis, interpretation and reporting of results, including recommendations.

Phase I

This phase requires testing the robustness of the assumptions made in preparing the current estimates of productivity by:

- Use the information presented in the World Penn Tables (WPT) at face value, and make all estimations consistent with the WPT data real capital stock (constant prices).
- Use common sense criteria (assumptions) to estimate price vectors for stocks of capital using the information available from the ABS on inflation (carefully document all the assumptions).
- Disaggregate real capital stock (constant prices) into price and quantity--for total stock of capital, and for stock of capital by the sectors as defined by the ABS in the national accounts (agriculture, hunting and forestry; fisheries; mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale and retail trade; hotels and restaurants; transport, storage and communication; financial intermediation; real estate, renting and business activities; education; health and social work; other community, social and personal services; and for government: agriculture, hunting and forestry; electricity, gas and water supply; construction; transport, storage and communications; public administration; education; health and social work).
- Design and implement sensitivity analysis to test for the robustness of the estimation of stock of capital of the previous step--use Monte Carlo simulations with common sense statistical distribution such as N (0,1).
- Present the results using confidence intervals for overall productivity and by sector.

Phase II

During the second phase, all available relevant information from secondary sources that relates to enterprise level information will be collected. These sources include: data existing in the ABS, Central Bank, from enterprise surveys executed in Suriname (2010 WB enterprise survey, 2011 IDB/Compete Caribbean and 2014 Proteqin IDB/Compete Caribbean), and from other sources to be identified by consultants. The secondary information includes enterprise level:

- Production information collected to estimate national accounts
- Sales
- Employment
- Balance sheets (assets and liabilities)
- Enterprise surveys
- Registration information (from the multiple institutions, such as the Chamber of Commerce and others)
- Information about sectors or subsectors
- Geographic location
- Additional relevant information available

Phase III

During the third phase two surveys will be designed and executed the first one as soon as possible, the second one a year or so later. The sample design would consider national representativeness as well as sector, size and type of enterprise representativeness (stratification by sector, by firm size, and by type of firm: public, state owned enterprise, and private). The survey will be a modified (and simplified) version of the enterprise survey executed in 2014 (proteqin). The survey will be simplified by focusing on: production, sales, employment, assets and liabilities, and capital assets; in addition to other information to provide a good overview of the firm for the analysis, but with less emphasis on assessing the business climate[1]. Importantly, the sampling design may consider the sampling design of 2014 proteqin, offering the opportunity to build a panel dataset in the future.

Phase IV

During the fourth phase the analysis of secondary (first, second phases) and primary (third phase) information will be analyzed. The analysis will answer the following questions:

- What is the overall labor productivity in the country?
- What is the overall capital productivity in the country?
- What is the estimate of overall total factor productivity in the country?
- Can important differences be detected by sector or firm size in any of the previous estimates? [identification of productivity gaps]
- Are there firm-factors that correlate with productivity estimates?

[1] WB and IDB enterprise surveys focus on teasing out information about the business climate. This survey will focus on collecting information about the factors that allow for measuring productivity.

4. DELIVERABLES AND REPORTING

4.1 DELIVERABLES

The project will achieve, at a minimum, the following results related to secondary information collected during the first phase of the project:

- Database with secondary information used for testing the robustness of assumptions of current productivity estimates
- Monte Carlo simulations testing for the robustness of current estimates of productivity
- Reports on the two surveys
- An Overall Report with results

Expected outputs of the second phase of the project

● Firm Production, Employment and Capital database. Database in electronic format with all existing information from secondary sources:

○ Design of the database- design of record information, size, links and sources, format
○ Identification of primary sources- systematic identification and description
○ Digitizing data collected at the highest level of detail available
○ Provide a systematic and clear distinction between firms that are public, state owned enterprises, and private
○ Complete annotation of information, source, comparability, reliability- include it in the database, as metadata. We need to know the strengths and weaknesses of the information in the database. The metadata may be kept in a format that is compatible with the software used for the database
○ If available, include in the description of the dataset sector information (such as agriculture, industry and services, or more disaggregated categories within; note that the ABS provides national account information for the following: agriculture, hunting and forestry; fisheries; mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale and retail trade; hotels and restaurants; transport, storage and communication; financial intermediation; real estate, renting and business activities; education; health and social work; other community, social and personal services; and for government: agriculture, hunting and forestry; electricity, gas and water supply; construction; transport, storage and communications; public administration; education; health and social work)
○ Assessment of robustness of secondary data collected

● Assessment of quality of information and identification of information gaps
○ Available information can be presented at a minimum by:
■ By economic sector and subsector (separating public, public enterprises and private)
■ By type of employment (permanent, part time)
■ By employee education level
■ By employee age and sex
■ By location
○ What is the frequency of information and data collection method?

○ Identification and prioritization of information gaps- include work plan to fill information gaps and estimate of costs

● Report summarizing results, including the analysis of production, labor, capital and total factor productivity using secondary information (as much as possible)

Expected outputs of the third phase of the project

The project will achieve, at a minimum, the following results related to primary information collected during the third phase of the project.

● Sample design for the execution of the enterprise surveys--stratified by sector, size, and type of firm as noted in this document. Importantly, the level of representativeness: at the sector level would include agriculture, industry and services; based on firm size of micro, small, medium and large firms using either employment or sales as the indicator of size; and type of firm defined as public, state owned enterprise, or private[23]

● Survey design and testing. The survey will be a simplified version of the 2014 proteqin IDB/Competitiveness survey, with added specificity on information about production, sales, employment, assets and liabilities, and capital assets. Econometric modeling to tease out estimates of productivity would be used to test es ante the information to be collected and the sampling design

● Training surveyors and field testing of the survey

● Survey execution

● Database of primary information collected during the execution of the survey
● Report of the data collection process (phase two), with emphasis on
○ Description of all steps of the process
○ Database description (including metadata)
○ Summary statistics of survey results
○ Identification of information gaps

[2] WB and IDB sponsored enterprise surveys exclude agriculture from the sample. This is done mostly because it is more expensive to survey producers, that tend to be small and scattered throughout the country. Because WB/IDB surveys are mostly used to assess the business climate, the lack of information from agriculture is assumed to be similar to information collected from industry and services. This project however, requires the analysis of agriculture firms given the relevance of the sector. To lower costs, the sample will only be representative of firms (not of individual producers) in the rice and fisheries sub sectors.

[3] The decision of firm size for cutoff levels for representativeness of firms is not trivial. The standard definition used in enterprise surveys sponsored by the World Bank and IDB use the general definition of size based on employment: micro enterprise if less than 5 employees; small between 5 and 19; medium between 20 and 99; and large more than 100 employees. This categorization is not useful in Suriname as it skews the sample, over representing micro and small firms and under representing large firms. In other words, it does not reflect the real distribution of firms by size in the country and erroneously classifies firms: firms classified as micro because they employ less than 5 people should be more appropriately classified as small; firms classified as small because they employ less than 20 people should be classified as medium; etc. The decision to use annual sales or a more Suriname-specific definition of firm size based on employment will be part of this project. An alternative to explore is to only use two classifications for size: less than 50 and more than 50 employees. Again, this is an important issue to be resolved during the execution of the project. The criteria of classification is to group "similar" firms in the sense that they face the same incentive frameworks.

- Identification of weaknesses in the information collected
- Recommendation for frequency of updates and further simplification of the survey, including the option of collecting only a portion of the survey (that related to the information necessary for productivity estimation) assuming that the main characteristics of the firm remain unchanged[4]

● Report of the second phase of the project

Expected outputs of the fourth phase of the project[5]

As noted, the third phase of the project presents the overall results of the analysis of secondary and primary data collected and answers the following questions:

● What is the overall labor productivity in the country?
● What is the overall capital productivity in the country?
● What is the estimate of overall total factor productivity in the country?
● Can important differences be detected by sector or firm size in any of the previous estimates? [identification of productivity gaps]
● Are there firm-factors that correlate with productivity estimates?

4.2 REPORTING

Expected reports

Three reports consistent with phase one, two and three as previously noted. A final report will summarize the analysis and information, according to the following outline.

- Final report
  - Description of data collected (secondary and primary)
    - Sources
    - Description
    - Testing for robustness of assumptions
    - Identification of information gaps
    - Work program to fill information gaps
    - Full database including metadata
  - Estimates of productivity
    - Overall
    - By economic sector
      - Assumptions
      - Results
    - By size
      - Assumptions
      - Results
    - By type of production unit (public, public enterprises, private)
      - Assumptions

[4] For example, a full-blown survey could be executed every 3 years, collecting only partial information from firms in the years in between.

[5] I expect that the third phase will be the responsibility of the Central Bank. For completeness, however, I write it down in the terms of reference. The contract with the firm that executes the project should refer only to phases one and two, not three.

        - Results
    - Work program for future updates
        - Filling information gaps
  - Identification of information gaps and suggestions
  - Suggestion for frequency of future primary data collect

5. COORDINATION AND SUPERVISION

5.1 The consultant will work closely with Mr. A. Chandansingh and will report to the Executive Director of the Competitiveness Unit Suriname, Mr. K. Foe-A-Man.

6. CHARACTERISTICS OF THE CONSULTANCY

6.1 **Type of consultancy:** National Individual Consultant

6.2 **Duration:** 6 non-consecutive months

6.3 **Place of work:** Ministry of Trade Industry and Tourism, Havenlaan # 1, Paramaribo, Suriname.

7. QUALIFICATIONS

7.1 **Qualifications:** At least 10 years' experience designing and executing enterprise surveys; experience performing economic analysis at the macro and firm level

7.2 **Experiences:** Design and execution of enterprise surveys; economic analysis

7.3 **Languages:** Dutch and English

8. SCHEDULE OF PAYMENT

THE PAYMENT SCHEDULE IS SPECIFIED BELOW:

- 20% upon signing of the contract and submission and approval of the methodological proposal;
- 40% after submission and approval of the first and second report;
- 40% after submission and approval of the third and final report.

Proposal Submission

Each proposal should be submitted in two parts:

A) Technical:

Technical Proposal must include:

- Brief description about the Consultant and detailed Resume of the Consultant.
- Consultants experience: In addition to overall experience of the consultant, details of specific consultancy projects/studies undertaken may be provided including Assignment/job name, description of services provided, appx. value of assignment,

country & location, duration of assignment, name of client, starting & completion dates, names of associates (other than employees), if any.

- Approach.
- Methodology.
- Work Plan and Schedule.

B) Financial:

Financial proposal/Consultancy Fee (in US dollars, to be paid in SRD based on the exchange rate of the Central Bank of Suriname) should be in the form of a lump sum amount inclusive of all taxes for the entire scope of services.