ESTIMATING CUBAN GROSS DOMESTIC PRODUCT PER CAPITA IN DOLLARS USING PHYSICAL INDICATORS

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ABSTRACT. A methodology for estimating levels of gross domestic product per capita (GDP/capita) which obviates the need for estimating GDP/capita in domestic currency and converting to another currency is the physical indicators (PI) approach developed by Janossy-Ehrlich. Using this methodology, estimates of Cuban GDP/capita in dollars for four years (1965, 1970, 1975 and 1977) have been made. The estimates rely on the relationships between GDP/capita in dollars and levels of consumption or production of 24 physical indicators in 28 reference countries for each of the four years. The relationships are estimated using both univariate and multivariate regression techniques. The PI estimates of GDP/capita in dollars are compared with other measures of Cuban macroeconomic performance to test their reasonableness. The paper closes with some tentative conclusions regarding the applicability of the PI method to the estimation of GDP/capita in dollars for Cuba and for other developing countries.

I. INTRODUCTION

Meaningful intertemporal or international comparisons of economic performance in revolutionary Cuba are hindered by the lack of adequate macroeconomic data. At the start of the 1960s, the Cuban government began to pursue a socialist development path and made significant changes in economic organization, including the adoption of central planning. Two results of these changes were the disruption of the national statistical data collection and processing system and the introduction of the material balances system, more compatible with central planning, as the basic national accounting system. Thus, for most economic series, a gap exists for the period 1959–1961 and, beginning with 1962, whatever macro-economic data exist follow the methodology of the Material Product System (MPS), which differs significantly from the System of National Accounts (SNA) methodology used by pre-revolutionary Cuba and by nearly all non-socialist nations. Moreover, because the Cuban peso has not been freely exchanged in international markets since 1962, it is not clear which is the appropriate exchange rate which should be used to convert Cuban data in domestic currency to another currency basis to permit international comparisons.
Although the availability of official data has improved over the years, the Cuban government continues to provide only minimal data on global economic indicators. Moreover, those macro-economic data which have been published are subject to frequent revisions and changes in methodology. At different points since 1964 the Cuban government has published time series data on the global social product (GSP), the gross material product (GMP) or the net material product (NMP), either in statistical yearbooks or in special publications of the National Bank, but only GSP is available for the entire period 1962–1980 albeit not calculated with a consistent methodology. Time series data on the value of non-material services are not available.

In an attempt to fill the data gaps, several institutions or organizations outside of Cuba (the U.S. Central Intelligence Agency, the U.S. Arms Control and Disarmament Agency, the World Bank) have made estimates of Cuban gross domestic product (GDP) in dollars or of gross domestic product per capita (GDP/capita) in dollars for one or more years during the 1960s and 1970s. Presumably, these estimates were made using a two-step methodology, i.e., by first estimating the value in pesos of goods and services produced (probably using the technique of scaling up to GDP by adding to GMP an estimate of the value on non-material services) and then converting to dollars using some peso-dollar exchange rate. Elsewhere we have attempted to evaluate the methodologies used in these efforts. Unfortunately, these estimates are afflicted by serious deficiencies which cast doubt on their reliability.

A methodology for estimating levels of GDP/capita in dollars which obviates the need for estimating GDP in domestic currency and then converting to dollars is the physical indicators approach developed by Janossy and Ehrlich. Although this method has been used by several researchers to estimate GDP/capita in dollars for centrally planned economies, to the best of our knowledge it has not been applied to Cuba.

The purpose of this paper is to report the results of our experimentation with the physical indicators approach to estimate Cuban GDP/capita in dollars for selected years. In Part II we present the methodology and describe the data used in the estimation. In Part III we report the results and in Part IV we compare them with other estimates of Cuban macro-economic performance. The paper closes with some tentative conclusions regarding the applicability of the method to the estimation of Cuban GDP/capita in dollars.