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Ex-ante evaluation of a targeted job program: Hypothetical integration in a social accounting matrix of South Africa

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ABSTRACT

To analyze policy impacts of a targeted employment program calls for a new approach of estimation. This study proposes a simple modification to a Social Accounting Matrix (SAM) in order to analyze the multiplier effects of a *new* sector. A different input composition, or technology, of the sector with targeted job provision makes a conventional analysis of final-demand injections on existing sectors invalid. Instead of a costly full-scale rebalancing, we apply the modification—so-called hypothetical integration—into a SAM to assess a proposed expansion of social care sector within the Expanded Public Works Program in South Africa.

1. Introduction

Input–output multiplier analysis has been one of the workhorses for ex-ante employment impact assessment. Its comprehensive description of an economic structure enables one to map out industry-level employment generation due to an external shock, such as government fiscal expansion. Social accounting matrix (SAM) as an extension of the input–output approach adds socio-economic aspects, i.e. workers and their household characteristics, coherently into the framework. Multiplier analysis based on SAM thus provides an adequate simulation platform to analyze policy impacts on disaggregated subgroups of households as well as industries. The method however rests on the supposition that the technical coefficients of production remain constant. Hence, modification of the SAM is necessary if an intended simulation exercise entails, in one form or another, a new technology requirement.

A government fiscal expansion, intended to provide jobs to a specific subpopulation group who are otherwise marginalized in the labor market, may require contractors to use a more labor-intensive production technology than a conventional one would demand. This type of intervention, in effect, changes the technology coefficients of the recipient industry, and it should appear as a new industry in the SAM for more accurate estimation. However, rebalancing the SAM can be costly and sometimes does not augment any economic meanings. This paper proposes a simple method to overcome the limitation in context of a policy simulation for South Africa.

As is well known, South Africa is experiencing one of the highest rates of unemployment among middle-income countries, reaching 25 to 30% over the last decade. To ameliorate the associated socio-economic pressures, in 2004 the government introduced a direct job creation initiative, the Expanded Public Works Program (EPWP), which has yielded some positive outcomes, but has been incommensurably small to the scale of needed intervention. Currently the scaling-up of the EPWP is under discussion and much research is under way. It is within this context that a modeling exercise was undertaken to assess the economy-wide, potential effect of a substantial expansion of EPWP with focus on different labor factor specifications that brought to light the theoretical and practical issues discussed below.

There are four main EPWP sectors designated for job creation, one of which is the EPWP social sector. This simulation exercise has focused on scaling-up the home and community-based care (HCBC) and early childhood development (ECD) programs, both of which are part of the EPWP social sector. Besides enhancing income and reducing unemployment, such social-sector job creation also results in reducing women's burdens of unpaid care work. HCBC workers perform a variety of tasks needed for the homebound and chronically ill (including HIV/AIDS patients), while ECD workers provide support

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to childcare centers in tasks that range from sanitation and meal preparation, to mental stimulation and psychological safety for children aged 1–6 years. The original estimates on types and numbers of proposed jobs—as well as associated implementation costs—are from an extensive study by Friedman et al., (2007) of the Health Systems Trust.[1]

EPWP consists of job opportunities provided to unskilled, unemployed, and marginalized poor individuals who work in projects that are labor intensive. They are hired at a minimum wage and, while receiving training and accreditation, they provide services for their communities. These projects are therefore not typical in comparison to the existing South African economic structure and cannot be represented by production conditions of similar sectors in the private or public domain. Along with employment targeting, the effectiveness of the program mandates that technologies be used to maximize the labor content. Any multiplier analysis of such a program should not rely on simulating an injection of public funds in sectors whose production technology is not subject to this mandate. Rather, the injection should introduce the new particularities and features of this government intervention. Hence, the EPWP technology, represented as more labor-intensive input composition in our study, must be introduced anew. Moreover, job targeting requires a separate, new account that is not governed by the existing employment distribution structure of South Africa. Therefore, to integrate these two technical requirements, modification of the existing SAM is required.

A simple hypothetical integration method is developed in this paper to circumvent a rebalancing of the SAM without sacrificing the accuracy of multiplier-effect analysis. Without a balanced SAM, simulation results violate the accounting identity principle in that total revenue does not equal to total expenditure for each account. The imbalance contradicts the underlying equilibrium concept in the multiplier analysis. Many examples of previous research that have required SAM modification can be found in the literature. For instance, Khan and Thorbecke, (1989) subdivided sectors (mainly agriculture) into modern and traditional ones to make evident technological dualism, namely the difference in technologies used. Cella, (1984), Milana, (1985), Clements, (1990), and Dietzenbacher et al., (1993), in order to estimate the value of a sector, engaged in hypothetical extraction by replacing the sector's domestic use and supply of goods with imports, thus eliminating the existing sector's linkages to the rest of the economy. The hypothetical extraction, combined with sectoral decomposition as in Khan and Thorbecke, (1989), may seem an alternative way to evaluate the impact of the proposed expansion of the public care sector. However, the unique labor requirement of the EPWP does not resemble the existing care sector-education and health care- in the SAM. Therefore, the extraction approach based on the decomposition of the sector is not feasible.

This paper uses an integration of a new *hypothetical* sector, called EPWP social sector (or EPWP in short) from an exogenous injection into the SAM by modifying the scale of the new sector. The scaling-down generates insignificant values for new accounts associated with the sector and, hence, may not violate an acceptable margin of error used in a conventional technical balancing. The insignificant values however preserve backward linkages that generate multiplicative effects of the intervention on the sector. The method is also flexible enough to incorporate policy exercises (in this study, employment targeting for the poor) into the SAM.

The usual practice of SAM rebalancing does not apply in this study, as a prior information basis on which minimum entropy method relies does not exist. The maximum entropy approach that does not require the prior information could be used for rebalancing, but at the cost of abandoning some useful prior information, such as a SAM from a previous time period. Moreover, technical balancing without any reference to compare before-and-after balancing (to evaluate the success of balancing) does not yield valuable knowledge upon which to analyze the impacts of the sector, especially when it comes to the hypothetical sector.

The structure of this paper is as follows: Section 2 provides a general description of the SAM structure and specific features of the South African SAM (SAM-SA) used in this paper; Section 3 describes the reformulation of SAM-SA for this exercise; an introduction to the fixed-price multiplier appears in Section 4; and the results and comparative analyses of the simulation are presented to draw attention on the need for reformulation in Section 5.

2. Social accounting matrix of South Africa

SAM-SA includes supply and use tables for 26 different sectors and household surveys from year 2000 (income and expenditure, and labor-force survey). Labor factors are disaggregated by educational attainment (a proxy for skill level) and gender to generate four different labor factor groups. The household accounts are elaborated on to the extent that they include location (urban and rural), residence type (formal and informal type of housing), race (African, colored-Asian, white), and income level (nonpoor for above 50 percentile; poor for 25–50 percentile; and ultrapoor for below 25 percentile), which ultimately generate 20 different household types.[2]

An outstanding feature of the South African SAM (SAM-SA) is the extremely biased income distribution towards nonpoor households, as shown in Table 1. In particular, the wage income distribution matrix reveals a biased flow into nonpoor households cutting across both gender and skill levels. Overall, 95% of wage income ends up in nonpoor households, which represent about 50% of the population.

One could speculate that the extreme inequality stems from a highly unequal wage hierarchy, labor market segmentation, and/or income-induced low human capital investment among the vast majority of the poor. In other words, it may be the case that workers from nonpoor households are more educated and skilled and thus, combined with job segregation structures, they end up receiving higher wages than workers from poor and ultrapoor households. True as these reasons may be, Table 1 describes the inequalities in the labor market in South Africa. Note that only 0.7 and 1.3% of wage incomes from skilled workers belong to the poor and the ultra poor who make up 36% of total households in the country. Unemployment rates for both male and female labor force participants are consistently higher for the poor and ultrapoor on the one hand and for Africans across all income groups (as compared to white and colored-Asian) on the other. For example, the unemployment rate for urban, nonpoor Africans living in formal (durable) housing structures is 23%, while for whites (all of who are nonpoor) it is 5.8%; for rural, commercial poor households, unemployment for Africans and colored-Asian households stands at 32.9% versus 14.9%, respectively. For the urban African ultrapoor it reaches as high as 81.1%. Household mean income per year varies greatly, in part due to unequal employment distribution across household type. In rough terms, nonpoor household receive 70–90% of the income from wages, whereas the wage shares are between 25 and 50% for the poor and the ultra poor with the remaining made up of remittances and various government transfers (PROVIDE, 2007). In the next section, we describe the method of reformulation of SAM-SA to incorporate the specifics of the EPWP's targeted employment policy coupled with poverty reduction.

[1] The full description of data and methodology used in the above study can be found in Antonopoulos and Kijong, (2008). Since the report is issued, the South African Government proceeded to the second phase of EPWP in April 2009, which focuses on social sector expansion to generate jobs for the poor and unemployed. It is not however clear whether the proposal by Friedman et al., (2007) is fully adopted in the implementation.

[2] For details on the construction of the household accounts, see Antonopoulos and Kijong, (2008).