An Input-Output Assessment of the Brazilian Development Bank (BNDES) Financial Support on Employment

Topic: Employment Policies
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The Brazilian Development Bank (BNDES) is the main source of long-term funding for the Brazilian economy, and it is among the biggest development banks in the world. It provides financial support for almost every economic activity in Brazil (agriculture, manufacturing, services and infrastructure) so that companies can start or expand their productive capacity, innovate and export. It also reaches both small and medium sized enterprises (SMEs) and big companies. To accomplish such a diverse mission, BNDES has a wide range of financial instruments, including standard credit lines, project finance, securities (shares, debentures, funds, etc.), financial guarantee, and non-reimbursable resources (grants).

Input-output models have been used by BNDES staff mostly to estimate the number of employments associated with fixed investment projects, meaning the employments needed to produce capital goods, industrial warehouses and infrastructure. The IO model used to estimate BNDESâ€™ impacts on the supply chain of investment projects consists in a basic Leontief model build with the most recent IO matrix calculated by the Instituto Brasileiro de Geografia e EstatÃ-stica (IBGE) for 2015:

X= A.X+F
X=ã€–(I-A)ã€—^(-1).F , assuming ã€–(I-A)ã€—^(-1)=L
X= L.F => âˆ†X=L.âˆ†F

Where L is known as the impact matrix (or LeontiefÂ´s inverse matrix). Now, to calculate the employment impact, let e be a matrix of employment coefficients by sector (employment to output ratio) and E the vector of total employment by sector. Considering X=L.F, the impact on jobs can be achieved by:

E=e.(L.f) => E= L Ì….f => âˆ†E= L Ì….âˆ†f

In BNDESâ€™ case, the demand shock is mainly connected with Gross Fixed Capital Formation (GFCF). Expenditures in fixed investments were identified and separated from the total amount disbursed by BNDES each year. On the other hand, expenditures on acquisition of imported equipment, on securities not associated with projects and on working capital were not included. The selected annual disbursements were classified in 49 sectors and the values were deflated to 2015 prices using a sectoral price index.

However, the demand shock vector must be composed by the sectors responsible for providing goods and services purchased by the investment projects, not the sectors investing represented in BNDESâ€™s disbursements. To achieve this goal, the model uses an â€œCapital Flow Matrix (CFM)â€• which contains the average proportions of machines, construction and services needed for each sector investment projects.

The initial results were calculated for the 2014-2023 period. The results can be decomposed in: (i) direct employments, which occur in the sectors that provide goods and services directly to investment projects, for example construction, equipment manufacturing and engineering services; and (ii) indirect jobs, which correspond to the occupations in the supply chains of the previous

sectors (i), for example, steel industry, electric material and cement. Almost 3 million jobs were associated with projects supported in 2014, a relevant outcome considering that in that year Brazil had about 40 million people working in formal occupations. The results fall over the next years, following the reduction in BNDES disbursements, but reach over 1 million jobs in 2022 and 2023. In average, about 59% of estimated jobs are direct jobs and 41% are indirect jobs.

The novelty of this paper is the way BNDESâ€™s data is tidied up to better fit IO analysis. The proposal for the final version of the paper is to advance in both input-output modelling and BNDES data using: (i) a series of annual IO tables (instead of using the IO matrix of 2015) estimated by Alves-Passoni and Freitas (2020); (ii) apply different methodologies for each BNDES financial instruments to expand the rate of disburments considered (ex: exports) and better calculate the demand shock; (iii) analyse other variables such as value added and taxes.

Finally, the expected general result is to qualify and quantify the impact of BNDES financial support in a sectoral perspective and also the development and consolidation of the IO framework as an effectiveness evaluation tool by BNDES and other development banks.