

## Flow-of-Funds Analysis in Brazil: Applying Input-Output Analysis Methods

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In this paper, we apply concepts of Input-Output Methodology on the Assets and Liabilities Matrix (ALM) to show the Flow-of-Funds (FOF) between agents in Brazilian economy. Proposed by Copeland (1952), the ALM adopts a quadruple entry system, logically developed from double entry accounting system, the financial assets and financial liabilities data came from the Balance Sheet of institutional sectors. As a square matrix, the ALM tabulation allows to use all the basic principles of modern accounting system to analyze the structure of financial flows in the economy and its effect on the flow of the real economy. Tsujimura and Mizoshita (2003, 2004) improved the FOF analysis, and this methodology has been used to study financial flows in Japan. The method has also been applied in studies for the economy of Korea (Kim, 2014), and has shown to be a powerful tool to analyze the domestic financial market. The contribution of this work is to show the effect of the financial transactions of economic agents in Brazil. Since the recent financial crises have been adversely affected on the product and on the growth of developing economies, we stimulate discussion on the subject and guide to search for more effective action, which will be regarded as the main contribution of this analysis.

The results indicate how "make and use" of financial resources affect the flow of capital in the economy and how the monetary policy which is established by the Central Bank of Brazil generates a greater spreading of resources in the economy. Since there are not any applications with similar approaches in Brazil, this study can be an important source of information for the future researches, evaluations and formulations of economic policies.

The link between the activities of the real economy and financial market transactions can be viewed through the economic flows. Therefore, Excess Financial Assets and Excess Liabilities in the Financial Accounts indicate respectively Investments and Savings in Non-Financial Accounts (Real Economy = transactions of goods and services + income transfers). In this sense, it is interesting to investigate the movements of financial accounts to understand its impact on the real economy. Moreover, policymakers will be able to refer to the results of this simulation as indicators to their decisions and policies. From this point of view, we intend to answer the following questions: Does the need for financing or excess resources of a given economic agent affect the flow of total capital in the Brazilian economy? Does the use or availability of surplus funds by an economic agent influence the movement of the cash flows of another economic agents? Do changes in monetary policies implemented by the Central Bank of Brazil encourage growth or shrink the economy? Has been the Central Bank of Brazil conducting monetary policies effectively? We built the financial transactions table of institutional sector-by-institutional sector using Brazilian data in 2005, which is composed of 6 institutional sectors or economic agents: Households, Government, the Central Bank, Financial Companies (excluding the Central Bank), Non-Financial Enterprises and external sector (Rest of the World). The Power of Dispersion Index (PDI) and Sensitivity of Dispersion Index (SDI) are calculated using Leontief Inverse matrix. These indicators show how the flow of funds spreads through the economy when one agent raises more funds or when it has excess of funds. Subsequently, we examine the monetary policy evaluations. In this model, the Central Bank of Brazil is treated as an exogenous sector. The net savings of the other agents in the economy which are induced by the Central Bank are calculated. The data of "Financial Sheet Accounts" published by the Central Bank of Brazil and the Brazilian Institute of Geography and Statistics (IBGE), the "Balance Sheet of the Central Bank of Brazil" announced by the Central Bank of Brazil are used for this analysis. Preliminaries results of DPI and SDI in 2005 demonstrate that "Households" sector shows the feature of representative "Savings Sector" with little scattering influence on the flow of funds. The "Financial Companies without the Central Bank" and "Non-Financial

Enterprises" displays characteristics of representative "Investors Sectors", since they show greater power of indices in the liability-oriented system and lower dispersion-power indices in the asset-oriented system. This result highlights the low influence of the Financial Companies of their financial investments. Both the Government and the Central Bank demonstrate high dispersion indices. It indicates that these sectors stimulate financial transactions throughout the economy when their additional fund raising or fund employment is increased.