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# Using the balance sheet approach in financial stability surveillance: Analyzing the Israeli economy's resilience to exchange rate risk☆

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ABSTRACT

This paper presents a framework for analyzing an economy's resilience to exchange rate risk using the balance sheet approach (BSA), which is gaining prominence worldwide in the surveillance of financial stability. The framework is applied to Israel's economy, by using an unique and extensive dataset: a combination of new national balance sheet data and foreign currency balance sheet data.

The analysis using the BSA shows that Israel's economy was highly vulnerable to a depreciation of the shekel in 1997, but from then until 2005 it became more resilient. The improvement was due mainly to the lowering of the business sector's high level of exposure to depreciation and its greater financial strength. This, together with higher capital adequacy in the banking system, made the latter more resilient to indirect damage that could be caused by depreciation. The analysis shows further that despite the heavy exposure of the economy as a whole and most sectors within it to appreciation of the shekel at the end of 2005, the economy was quite resilient to such appreciation, as the private sector and the banks suffered little direct or indirect damage through it. The analysis stresses the central, but not exclusive, role played by the banks' resilience in the economy's financial stability, and thus also favors the continuation of the process of reducing the banks' dominance in financing the business sector, so that their indirect exposure to financial risks will fall. The findings yielded by the BSA are highly significant, because an analysis using the traditional approach leads to very different results, viz., that in 1997 the economy was not vulnerable to changes in the exchange rate, and that in 2005 it was highly vulnerable to shekel appreciation.

The conclusions in the paper support the use of the balance sheet approach as an important instrument in surveillance of financial stability, the formulation of other similar frameworks for analyzing financial risks, and the provision of more detailed data in the national balance sheet that would enable a deeper analysis of overall economic risks and the risks in the major sectors.



## 1. Introduction

The balance sheet approach to analyzing financial stability is a sectorial approach to analyzing the financial risks of the economy as a whole, based on the assets and liabilities of each sector in the economy (national balance sheet accounts). The novelty of this approach is that it does not focus solely on the activities and financial robustness of the economy as a whole vis-à-vis abroad, as is the traditional approach, but also looks at activities within the economy; the focus is on the heterogeneity of the sectors regarding their levels of exposure to various financial risks and their financial strengths, and on the relationships between the sectors, which could intensify shocks and cause financial crises. In addition, besides the usual macroeconomic data such as GDP, budget deficit and inflation, which are usually flows of data, greater attention is also placed on stocks of data, that is financial assets/liabilities held by the various sectors. These are designed to reflect the possible influence of shocks on the economy through their influence on financial aggregates and various indices from the balance sheets of the different sectors.

The national balance sheet accounts – used for implementing the balance sheet approach – present the balance sheets of financial and non-financial (real) assets and liabilities of each sector in the economy vis-à-vis every other sector, as a complete and closed data system, and as part of the data in the National Accounts according to the standards set by international institutions. The major sectors usually included in the national balance sheet are: the financial sector (banks, institutional investors and others), the business sector (non-financial companies), the household sector (individuals), the government and the central bank, though sub-sectors of these

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could also be presented. In addition to the interactions between these domestic sectors, the national balance sheet also includes data on the interactions of all of these vis-à-vis the nonresident sector.

In recent years greater worldwide attention has been given to the importance of the balance sheet approach and of national balance sheet data for analyzing financial stability. This is reflected in the publications of both central banks, and international institutions such as the International Monetary Fund (IMF) and the European Central Bank (ECB), and by academic writing on financial crises. As a result, the availability of such national balance sheet data has expanded and the use of these for analyzing financial stability based on the BSA continues to grow. Many countries have begun publishing national balance sheet accounts (most of them only partial) in recent years, and the balance sheet approach for current analyses of economies has already been adopted, particularly by the IMF. Despite the improvement in the data infrastructure of national balance sheets, it still does not meet most requirements for analyzing financial stability. What is more, as the usage of BSA for analyzing financial stability is still in its infancy, there is no acceptable analysis framework, that clearly and systematically defines the use of national balance sheet accounts and their contribution to the understanding of changes in financial stability.

In Israel we are also at the very start of the road on the subject of national balance sheets and the BSA: In 2002 the Central Bureau of Statistics published, for the first time, Israel's National Balance Sheet Accounts for 1995 [see Central Bureau of Statistics (2002)], and only recently, with the encouragement of Bank of Israel, has completed preparing data for the national balance sheets for 2001–2004, with the intention of publishing these regularly in the future.[1] Despite the importance of the publication of Israel's national balance sheet and its importance in analyzing the financial activity of the economy, the level of detail and classification of assets and liabilities presented in the accounts today do not allow for the measurement of various sectors' exposure to important financial risks such as exchange-rate, liquidity and interest-rate risk. However the Foreign Exchange Activity Department of the Bank of Israel has for some time regularly produced a detailed "foreign currency balance sheet" of assets and liabilities in foreign currency (denominated in, or indexed to, foreign currency, including derivatives) of all sectors in the economy vis-à-vis other sectors, similar to national balance sheet accounts, as well as data on foreign currency flows by sector. These data make it possible, *inter alia*, to calculate the various sectors' exposure to the exchange rate. Naturally, no one has yet used the new national balance sheet data and the BSA, while the foreign currency balance sheet data is used regularly by the Bank of Israel mainly to analyze developments in the foreign exchange market, by sector (see Hecht et al., 2002). Analyzing the foreign currency balance sheet showed that the Israeli economy moved from exposure to depreciation of the shekel to exposure to appreciation of the shekel and that great changes in certain sectors' exposure to the exchange rate risk took place over the past decade, but the significance of these changes to financial stability has yet to be thoroughly investigated.

This paper uses for the first time a combination of national balance sheet data and unique and extensive foreign currency balance sheet data for Israel, in order to demonstrate analyzing financial stability by the BSA. To do this we develop a framework for analyzing the resilience of the economy to exchange rate risk, as part of the analysis of financial stability by the BSA, and apply it to Israel. This paper is set out as follows: as background to the analysis, in Part 2 we expound on the BSA and national balance sheets worldwide. In Part 3 we present the framework we developed to analyze the economy's resilience to exchange rate risk while the findings of applying this analysis in Israel in 2005 compared to 1997 are presented in Part 4. Finally in Part 5 we conclude and discuss policy conclusions. The three appendices present and explain the national balance sheet accounts and the foreign currency balance sheet as well as additional data used to support our analysis of resilience to exchange rate risk.

## 2. Background—the balance sheet approach and national balance sheets around the world

A. In recent years there has been increasing international recognition of the importance of the balance sheet approach and of national balance sheets in analyzing financial stability. Many articles and publications reflect this growing recognition, though the major work on this subject was produced by the IMF in 2002 (see Allen et al., 2002). This paper asserts that the division of the economy into sectors, and viewing assets and liabilities by sector in terms of size, dispersion and quality, has many advantages and is very important in analyzing financial stability. Furthermore, this paper upholds that existing problems or weaknesses in the balance sheet of any particular sector could spill over into other sectors of the economy and could become so strong that it affects the financial system; in this way problems registered in the financial balance sheets of various sectors translate finally into a financial crisis, for example in the balance of payments or the banking system, which amplifies the harm to the economy. While these problems could continue for some time and have no substantial effect, a shock of some kind to the economy could lead to a sudden change which could presage a crisis. The BSA places an emphasis not only on identifying the balance sheet weaknesses of various sectors, but also on identifying and understanding the source of these weaknesses, and also on the policy steps that should be taken to strengthen the balance sheet and prevent crisis scenarios. It thereby becomes an approach for both understanding and analyzing financial stability and for influencing it too.

The IMF paper presents four types of basic weakness that could appear in the balance sheets, and could lead to a crisis: (1) *liquidity and interest-rate risks*—where a mismatch in maturity and times of interest-rate changes of assets and liabilities could create exposure to changes in demand for liquidity or in interest rate; (2) *foreign currency risk*—where the gap between assets and liabilities in foreign currency creates exposure to changes in the exchange rate and affects capital flows; (3) *dangerous capital structure*—where high financial leverage reflects a heavy dependence on debt and credit as means of finance and not on equity. Such a financing structure expresses high sensitivity to shocks in the economy, high credit risks and low capital adequacy; (4) *solvency problems*—where assets no longer cover liabilities, and net worth becomes negative. Such a solvency problem could stem from the other three problems, though could also arise from other circumstances.

The paper claims that in *post factum* analysis of financial crises of recent years in various countries (in East Asia, Mexico, Turkey and Russia, for example), one could find these basic weaknesses in the financial balance sheets of certain sectors in these economies. These weaknesses were generally a major and important factor in the realization of risks in these countries, and which eventually ended in crisis. As an example, the paper presents an analysis of the financial balance sheet of Thailand at the end of 1996 and in

[1] Data on particular segments within the national balance sheet accounts have been available before, such as the public's assets portfolio, the capital stock in the economy, the economy's assets and liabilities vis-à-vis abroad (the International Investment Position), but each stood alone and was not published as part of a comprehensive and consistent set of data.