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Analysing the financial strength of Tunisia: An approach to estimate an index of financial safety



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ABSTRACT

This paper analyses the strength of the financial system of Tunisia through the construction of an Index of Financial Safety (IFS). Over the period 2000Q1–2014Q3, the IFS is built using a wide range of financial and macroeconomic indicators. The empirical results show that it can capture the disturbances in Tunisian financial system with sufficient accuracy.

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1. Introduction

The underlying root causes of financial and macroeconomic imbalances lie not only in disequilibrium in current account balances, such as the huge current account deficit in the USA or the large current account surplus in China, but also in financial recession that has shaken some Arab world countries as a result to political events. After the collapse of the Ben Ali's regime in beginning of 2011, the Tunisian economy has been hampered by a general stagnation, leading to a rise in political risk, deterioration in growth prospects, a drop in external liquidity and foreign exchange reserves, a weakening in fiscal performance compared to historical orthodoxy of Tunisia in terms of public finance management, and inefficiency of the monetary policy with the exhaustion of all the ways available to the central bank to help to remedy the situation. Moreover, the local capital market is small and banks' access to external funding is restricted and concentrated primarily on Tunisian expatriate deposits or long-term loans from multilateral lending institutions. This recession has had negative impacts on the financial strength of the country as well as the access's conditions to the international financial market.

To avoid financial recession and instability, central banks attempted to implement reforms and new policies that aim to prevent financial crises, and thus, to establish a stable, efficient and reliable financial system. A stable financial system helps not only to facilitate the smooth flow of funds between investors and savers, but also promote growth in economic activity. For this purpose, policymakers and researchers highlighted the need for developing some measures based on aggregation of the main financial indicators, which reflect the varied dimensions of states of financial system. These measures include Early Warning Systems (Caggiano et al., 2014; Catullo et al., 2015; Li et al., 2015), financial soundness indicators (Cihak and Schaeck, 2010; Kasselaki and Tagkalakis, 2013), monetary conditions index (Batini and Turnbull, 2002; Osborne-Kinch and Holton, 2010) and financial conditions index (Matheson, 2012; Guihuan and Yu, 2014; Angelopoulou et al., 2014). Appraising

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the financial health of a country refers to know whether its financial structure is balanced or not. Financial safety indices enable to assess the ability of the country to face a recession or to seize opportunities for development. The aim of this paper is to investigate the financial safety of Tunisia by constructing a financial safety index through the use of factor analysis. There is a wide range of studies on this topic, especially on Early Warning Systems (EWS). Recently, [Matkovskyy \(2014\)](#) developed a new index, namely index of financial safety (IFS), which is based mainly on financial and macroeconomic variables. Our contribution in this paper is to continue in the same line of [Matkovskyy \(2014\)](#) while taking into account some specificities of Tunisia. In particular, as this country has witnessed a revolution, we include new variables as proxies for political stability conditions in modelling financial safety.

The remainder of the paper proceeds as follows. In Section 2, we review the proxies commonly used in the literature for measuring financial safety as well as we describe our own measure that will be applied in this paper. Section 3 presents the data and the methodology. Section 4 provides an overview on the financial context in Tunisia. In Section 5, we discuss the empirical results while Section 6 concludes.

2. The main issues of financial safety measurement

Sufficient level of financial safety means that financial system can implement all its functions. The core function of a financial system is to facilitate the allocation and deployment of economic resources that is the same in all economies ([Merton, 1990](#)). Therefore, the application of a functional approach to financial safety analysis is preferred to institutional one.

To ensure the implementation of this function, a financial system should safeguard a number of actions. One can distinguish the main ones. First, its monetary subsystem should serve as a medium of exchange, as a store of value, as a unit of accounting and as a standard of deferred payment. Second, a financial system via its stock market institutions has to provide an adequate inter-sector, inter-industrial and inter-regional capital transfer. Third, a financial system should channel an economic system with foreign currency to abide to the active balance of payments. Therefore, the financial safety includes three main counterparts, namely monetary safety, currency safety and stock market safety ([Matkovskyy, 2014](#)).

2.1. Literature review

Financial indicators have been the subject of several researches in the wake of the global financial crisis. Early Warning Systems (EWS) are among the models the most commonly used in preventing financial crises. The EWS enable the prediction of the occurrence of a financial turmoil over a given time period. [Caggiano et al. \(2014\)](#) developed an EWS for predicting systemic banking crisis in 35 Sub-Saharan African countries over the period 1980–2008. They used a multinomial logit model with 8 explanatory variables. Their results show that crises in these countries are associated with low economic growth, banking system illiquidity and large foreign exchange net open positions. Similarly, [Hmili and Bouraoui \(2015\)](#) applied an EWS on 6 Asian emerging countries over the period 1973–2012, but they enlarged the explanatory variables and employed 13 measures ranged into macroeconomic, financial and external variables. Based on multivariate panel logit approach, they pointed out that only 6 measures are solid predictors of banking crises, in particular inflation which demonstrates the most significant power. The selection of independent variables is so-over arbitrary and differs from one author to another. In line with this assumption, [Drehmann and Juselius \(2014\)](#) tested the effectiveness of early warning indicators of banking crises in 26 economies. Among 10 macroeconomic variables, the authors indicated that credit-to-GDP gap and debt service ratio are the best performing early warning indicators. The authors emphasize the importance of focusing only on the most relevant indicators, rather than selecting a wide range of potential variables.

To continue supporting macro-prudential analysis and evaluate strengths and vulnerabilities of financial systems, the International Monetary Fund (IMF) created at the end of the 90s the Financial Soundness Indicators (FSI). FSIs are considered as synthetic indicators related to the stability level of a financial system. [Cihak and Schaeck \(2010\)](#) and [Babihuga \(2007\)](#) investigated whether FSIs provide an accurate signal for the identification of banking crises. By using multivariate logit regression on a panel of 100 countries during the period 1994–2007, [Cihak and Schaeck \(2010\)](#) report that the probability of occurring banking crises is lowered with high capital to risk-weighted assets and high return on equity. Non-performing loans to total loans and capital adequacy ratio are also found to be useful indicators for the build-up of banking turmoil. Whereas [Babihuga \(2007\)](#), by using a panel dataset covering 96 countries, finds evidence that inflation rate, real effective exchange rate, and real interest rates emerge as important determinants of FSIs. The author adds that the relationship between macroeconomic indicators and FSIs changes significantly across the sample of countries. [Kasselaki and Tagkalakis \(2013\)](#) analysed also the behaviour of FSIs in time of crisis. They considered 20 OECD economies between 1997 and 2009, and demonstrated that both regulatory capital to risk-weighted assets and non-performing loans to total loans have risen, while loan loss provisions as well as profitability have dropped dramatically.

Other measures of financial safety include monetary conditions index and financial conditions index. Monetary conditions index (MCI) constitutes a measure of the stance of monetary policy through the combination of both interest rates and exchange rates. In practice, MCIs are used as operational short-run targets for monetary policy. [Batini and Turnbull \(2002\)](#) estimated a macro-econometric model over the period 1984Q4–1993Q3 to build a dynamic MCI for the United Kingdom. Their findings show that dynamic MCI is a useful indicator for both stance and inflation. However, [Osborne-Kinch and Holton \(2010\)](#) argue that although that MCI is straightforward and easy to calculate, it cannot be considered as reliable stand-alone

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