Exploring the Nexus Between the Shadow Economy, Finance, and Economic Growth in Tunisia:
Asymmetric NARDL Model

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ABSTRACT

This study aimed to assess the effect of the shadow economy on the finance-growth relationship in Tunisia over the period 1984-2020. The authors used a nonlinear autoregressive distributed lags (NARDL) model to verify the impact of the informal economy as measured by Tanzi's method on the finance-growth relationship. The results suggest that in the long term, with a positive change at the level of the shadow economy, the effect of financial development on growth becomes negative. The opposite is also true. However, in the short run, asymmetric effect of the shadow economy is only detected on economic growth and not on the financial development-economic growth nexus. Indeed, the level of the informal economy has an important role in the Tunisian economy. The significant and positive impact of financial development on the economy is strongly influenced by the size of the informal economy.

1. INTRODUCTION

The challenge of achieving sustained economic growth has long plagued developing countries as they strive to meet the aspirations of their people. The obstacles to growth vary between countries, including factors such as natural and human resources, technical knowledge, and capital. However, it is widely recognized that increasing a country's capital resources is essential for accelerating economic progress. As such, the financial system plays a crucial role in the growth process. This relationship between financial development and economic growth has generated a vast body of literature (King and

Levine, 1993a, b; Thornton, 1994; Gregorio and Guidotti, 1995; Berthelemy and Varoudakis, 1996; Greenwood and Bruce, 1997; Greenwood and Smith, 1997; Blackburn and Hung, 1998; Rajan and Zingales, 1998; Beck et al., 2000; Kirkpatrick, 2000; Craigwell et al., 2001; Fase and Abma, 2003; Beck and Levine, 2004; Ang, 2008a; Fung 2009; Kar et al., 2011; Murinde, 2012; Pradhan, 2013; Hsueh et al., 2013; Herwartz and Walle, 2014; Uddin et al., 2014; Menyah et al., 2014).

Some authors have emphasized the non-linear relationship between financial development and economic growth, but the sources of this non-linearity remain inconclusive (Shen and Lee, 2006; Deidda and Fattouh, 2008; Cecchetti and Kharroubi, 2012; Law and Singh, 2014; Arcand et al., 2015; Ibrahim and Alagidede, 2017; Mhadhbi and Terzi, 2022).

One of the main challenges faced by developing countries is the informal economy, which negatively affects the financial sector (Blackburn et al., 2012; Bose et al., 2012; Capasso and Jappelli, 2013; Straub, 2005; Dabla-Norris et al., 2008). Blackburn et al. (2012) and Capasso and Jappelli (2013) argue that the development of the shadow economy renders the financial system unable of effectively managing economic functions. So, the growth of the shadow economy can impede economic progress through its impact on the financial system. In Tunisia, the informal economy affects all sectors and regions, including the service sector.

This paper aims to study the role of shadow economy asymmetric changes in the relationship between financial development and economic growth, using the nonlinear ARDL for Tunisia. Empirical evidence supports the assumption that a large shadow sector reduces the allocation of the financial sphere to the real sphere.

This paper makes a two-fold contribution. First, this study develops a proxy for measuring the informal economy of Tunisia using the Tanzi method (1980). Second, it investigates the potential asymmetric relationship between the informal economy, financial development, and economic growth. The study adopts the asymmetric co-integration methodology, namely the NARDL model (Shin et al., 2014).

The paper is structured as follows: Section 2 outlines Tanzi's methodology for calculating a proxy for the shadow economy of Tunisia. Section 3 describes the proxy measures of financial development and economic growth. Section 4 focuses on the econometric methodology used in the study. Section 5 analyzes the empirical results, and Section 6 summarizes the conclusions.

2. MEASURING THE SIZE OF THE SHADOW ECONOMY: APPROACHES AND CHALLENGES

The shadow economy, also known as the non-observed economy, refers to markets where the exchange of goods and services occurs illegally, including the provision of illegal goods to consumers. Due to the hidden nature of these markets, they are difficult to observe and measure. To address this issue, economists have developed various methods to estimate the level of the informal economy in different countries.

There are two broad approaches to measuring the informal economy: indirect and direct. The direct approach relies on microeconomic data to estimate the scale of non-observed activities through surveys or tax audits. On the other hand, indirect approaches use four different methods: national accounts, monetary aggregates, demand for money, and multivariate methods. These methods are not easily comparable and may produce skewed estimations due to the nature of the field of activity. However, these methods are continuously evolving to address the complexity of the issue, and there is a need to complement the direct approach with macroeconomic estimations. The indirect approach is more relevant as it takes into account all available information on producing units and market balances.

The demand for money is one of the most important indirect methods to estimate the size of the informal economy (Gutmann, 1977). It is based on the assumption that individuals tend to use cash for their informal transactions to avoid detection by tax authorities. However, this method also has

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