Does the stock market cause economic growth? Portuguese evidence of economic regime change☆

Luís Miguel Marques [a], José Alberto Fuinhas [b,*], António Cardoso Marques [b]

[a] University of Beira Interior, Covilhã, Portugal
[b] NECE and University of Beira Interior, Management and Economics Department, Estrada do Sineiro, Covilhã, Portugal

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ABSTRACT

The relationship between stock market and economic growth is tested for Portugal (1993–2011), which is a small open economy dependent on bank financing. The relationship between economic growth and bank financing is also appraised. Using Vector Autoregressive (VAR) modeling, Granger causality, variance decomposition and impulse response function are discussed. The physical replacement of the currency, as a consequence of the integration in the European Monetary Union, proves to be an economic regime change. The effect of the subprime crisis was also proved. There is evidence of Granger bidirectional causality between the stock market and economic growth. Meanwhile, there was no evidence of causality running from bank financing to economic growth.

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1. Introduction

The relationship between economic growth and the financial system, whose components are stock markets and the banking system, has received considerable attention for decades (e.g. Beck and Levine, 2004; Capasso, 2008; Goldsmith, 1969; Keynes, 1973; Levine, 1991; Schumpeter, 1982). Traditionally, Anglo-Saxon countries use mainly the capital market for corporate financing, while in non-Anglo-Saxon countries the banking system predominates (e.g. Marini, 2005; Lee, 2012).

The use of long series as well as the control of structural changes might be important in determining the relationship between the financial system and growth. Given that structural changes may have the strongest impacts on a small economy, we will focus on Portugal. This exercise will allow us to verify the interaction of variables during the 1990s and 2000s, a period full of both economic and political change. Considering that Portugal is a non-Anglo-Saxon country, the banking system is expected to play a more significant role in the economy than the stock market.

The analysis of the relationship between stock market and economic growth was extended by using Vector Autoregressive (VAR)

modeling, controlling for economic regime change experienced in the Portuguese economy. That change is a consequence of joining the European Economic and Monetary Union (EMU), and it is econometrically controlled by using an exogenous variable, namely a shift dummy. The main questions of this study are: (i) will the stock market play an important role in Portuguese economic growth? and (ii) will the banking system therefore be influential in Portuguese economic growth? Both stock market development and the banking system are expected to play a positive role in economic growth.

Results suggest that the stock market Granger-causes economic growth. However, this Granger causality is not verified from banking system to economic growth. This study allows us to better understand how to act in terms of economic policy for the financial system, focusing on the stock market segment or banking segment.

This paper evolves as follows. Section 2 covers the literature review. Section 3 presents the data and model used. The results shown in Section 4 are discussed in Section 5. Section 6 concludes.

2. Literature review

The relationship between the financial system and economic growth received increased interest from the 1990s (e.g. Levine, 1991; Pagano, 1993; Spears, 1991), due to Lucas and Romer's endogenous growth theory. In reality, research had already been conducted on this subject for several decades (e.g. Goldsmith, 1969; Gurley and Shaw, 1955; Keynes, 1973; Schumpeter, 1982; Shaw, 1973). We can divide the financial

system into two components: the stock market and the banking system. Consequently, any approach to the relationship between the stock market and economic growth cannot fail to include the banking system. It is expected that stock market development will play an important role in economic growth (e.g. Capasso, 2008; Demirguç-Kunt and Levine, 1996; Levine and Zervos, 1998; Singh, 1997).

Nonetheless, the concept of stock market development is not clearly defined. As a result, four indicators can be used to study stock market development (e.g. Demirguç-Kunt and Levine, 1996): (i) market capitalization; (ii) volatility measured by standard deviation of stock market; (iii) indicators of institutional development; and (iv) regulation indicators. Since the banking system must be included, it can be measured by the ratio of domestic credit to GDP or the ratio of nominal money supply (monetary aggregate M2) to nominal GDP. Other variables are often used for robustness of the model. The most common is inflation (e.g. Bassanini et al., 2001).

Studies dealing with the financial system and economic growth have been discussed mostly in quantitative terms, through cross-country (e.g. King and Levine, 1993; Levine and Zervos, 1998) panel data (e.g. Luintel and Khan, 1999; Zang and Kim, 2007) and time series (e.g. Gries et al., 2009; Masih et al., 2009; Wolde-Rufael, 2009). Causal relationships between stock markets and economic growth have been shown (e.g. Adamopoulos, 2010; Nieuwerburgh et al., 2006). Causality could be from stock market to economic growth, from economic growth to stock market (e.g. Shahbaz et al., 2008) or bidirectional (e.g Capasso, 2008; Hondroyiannis et al., 2005; Ndako, 2010; Tsouma, 2009). On the other hand, causality may not be present. The analysis of causality was extended to combine the short and long run, as well as strong causality (Bangake and Eggoh, 2011). The direction of causality could be central for economic policy decision making.

The empirical analysis of the relationship between financial development and economic growth reveals richness in the methodologies followed, as well as absence of unanimity with regard to explanatory variables. Indeed, variables like thresholds of inflation, turnover ratio, government size, *per capita* income, trade openness, and stock market indicators such as size, activity and efficiency are common in the literature (e.g. Bangake and Eggoh, 2011; Beck and Levine, 2002; Bordo and Rousseau, 2012; Huang et al., 2010; Naceur and Ghazouani, 2007; Yilmazkuday, 2011). In the empirical model developed here, the variables used are: real gross domestic product; market capitalization ratio; domestic credit ratio; investment ratio; and consumer price index. The respective support of these variables is presented in the next section.

As stated above, attempts have been made to identify the relationships between stock market and economic growth for several countries (e.g. Adamopoulos, 2010; Hondroyiannis et al., 2005; Ndako, 2010). For Portugal, it was expected that the stock market, as well as the banking system, would play a positive role in economic growth. Indeed, the banking system must play an important role in the Portuguese economy. As a continental European country, its companies have to rely largely on financial institutions to obtain funds (e.g. Lee, 2012). On the other hand, Boubakari and Jin (2010) concluded that stock market development is not sufficiently significant to cause economic growth. Overall, there are three landmarks that could potentially play a role in the relationship between the Portuguese stock market and economic growth: (i) integration in the EMU; (ii) the integration of the Portuguese in Euronext; and (iii) the subprime crisis.

The Portuguese integration in the EMU caused a structural shock in the volatility of GDP (e.g. Fuinhas and Marques, 2011). However, in the literature there is a gap regarding the structural change caused by economic regime changes, such as the monetary economic regime change caused by integration in the EMU (e.g. Spiegel, 2009). Also, the level of country development is important, given that it is related to the effect that the stock market has on long-run growth (e.g. Capasso, 2006; Caporale et al., 2004; Durham, 2002). Furthermore, the existence of more developed financial mechanisms in countries with higher income levels contributes to a lower influence of stock markets in the growth of these countries (e.g. Filer et al., 2000). In its turn, Nielsson (2009) refers that if the development of the stock market drives economic growth, then the evolution of the Portuguese stock market with the integration in Euronext should have been materialized in GDP.

3. Methodology

Financial development, as a result of endogenous growth process, is far from new in the literature (e.g. Bose and Cothren, 1997; Greenwood and Jovanovic, 1990). Indeed, it is expected that all variables will interact with each other causing an effect of an endogenous adjustment, and therefore the use of VAR technique is required. This technique treats the variables as potentially endogenous, evaluating the relationships without the prior need to distinguish endogenous from exogenous variables, as required by the simultaneous equations model. In the analysis of the relationship between developed stock markets and economic growth, this technique was used, for example by Caporale et al. (2004), and Tsouma (2009).

3.1. Data

The study uses quarterly data for the time span covering the first quarter of 1993 till the last quarter of 2011, in a total of 76 observations. Table 1 shows the definitions, sources and summary statistics of the variables. As can be seen, the raw data consists of: the nominal GDP; the PSI 20 index; the domestic credit, with the exception of public administration and domestic credit to public administration; nominal gross fixed capital formation (GFCF); and the GDP deflator (base 2006). Econometric software Eviews 7.2 was used.

The variables used are consistent with those adopted by the existing literature, as follows:

Real gross domestic product (LY) – The literature tests the relationships between economic growth, upon the real gross domestic product and the development of financial markets. In general, the literature indicates that long-run growth is positively associated with the development of stock markets (e.g. Levine and Zervos, 1996, 1998; Singh, 1997), and that the liquidity of stock markets is strongly correlated with current and future rates of economic growth (Levine and Zervos, 1998).

Stock market capitalization ratio (LS) – This variable is the ratio of the total value of listed shares (market capitalization) to GDP, both in nominal values. This variable aims to measure the development of stock markets under the assumption that the "size" of the market is positively correlated with existing liquidity (Levine and Zervos, 1996). Other potential measures of the development of stock markets, such as liquidity or diversification of risk, could be used. However, the respective series are unavailable for the Portuguese stock market over this span of time. Market capitalization is available from January 2009, and shows a discontinuity starting October 2010. Considering the way of calculating market indices, and their frequent revisions, they tend to mimic market capitalization. With this in mind, we opted to use a proxy. Indeed, a market capitalization proxy, through the PSI20 price index, was computed. To that undertaking, we use the latest available data about market capitalization and PSI20, namely from January 2009 till September 2010 (20 months), in order to capture the relationship between them. The market capitalization proxy computation evolves in two steps. In the first one, in accordance with Eq. (1), we compute a factor (R) relating the two variables, as follows:

$$R = \sum_{t=1}^{n} PSI20Quote_t \Big/ \sum_{t=1}^{n} PSI20Cap_t, \tag{1}$$