Chapter 13
Measuring Firms' Financial Constraints:
A Rough Guide to Unlisted SMEs

Carlos Carreira
https://orcid.org/0000-0002-4786-5605
CeBER, Portugal & University of Coimbra, Portugal

João Eira
University of Coimbra, Portugal

Filipe Silva
OECD, France

ABSTRACT

Measuring firms' financial constraints can prove to be a difficult task for researchers because it is not possible to directly observe whether a firm is financially constrained. This chapter surveys the existing methodologies to measure such constraints at firm level, discussing the advantages and disadvantages of each one. In doing so, firstly, the authors review the direct and indirect measures of firms' financial constraints. Then they test the validity of the most commonly used indices using a large panel of (unlisted) Portuguese firms (2010-2017). The FCP index seems to outperform the other indices in capturing financial constraints of unlisted SMEs. This is not a surprising result, as most of the existing empirical literature on the field deals with listed (US) firms. It is not reasonable to expect that the coefficients of indices remain unchanged across countries and over time. Therefore, the authors propose their (re) estimation to apply them to different economies.

INTRODUCTION

In the last three decades there has been increasing interest in the question of whether the firms' investment decisions are constrained by the availability of finance. However, measuring firms' financial

DOI: 10.4018/978-1-7998-2136-6.ch013

constraints can prove to be a difficult task. The first issue is immediately the definition. If we adopt a 'classical', more precise, but broader definition that a firm is financially constrained if there is a wedge between the costs of using external and internal funds, virtually all firms can be classified as so. Defining financial constraints as the inability of a firm to raise the funds needed to finance their investments will carry us to a higher level of abstraction (Carreira and Silva, 2010). As a matter of fact, it is not possible to directly observe whether a firm is financially constrained and the extent of such constraints. No matter how detailed our knowledge of a firm's balance sheet, no single item, or combination of items, answers this question. As a result, researchers have devoted their time to trying to find a methodology that consistently allow identifying and measuring firms' financial constraints.

Several empirical challenges arise when one thinks about what it means for a firm to be financially constrained. Firstly, it is not an either-or question. There are not two populations of firms, those with and without financial constraints. Any measure of financial constraints must be able not only to identify its existence, but also to provide an estimate of the extent to which it affects the firm. Secondly, said measures must be able to account for heterogeneity between firms. For example, young and small firms are likely to face more severe problems in accessing external finance as they are more likely to suffer from asymmetric information problems and they have fewer collateral values (Carreira and Silva, 2010). Finally, a firm that is currently constrained can move to unconstrained state in the future (or across different degrees of constraint). Therefore, a good measure of financial constraints would also be able to identify over time whether a firm is financially constrained as well as its extent. Overall, a good measure of firm's financial constraints should be objective, continuous (or accommodate different degrees of constraint), firm-specific and time-varying (Silva and Carreira, 2012a).

In their *Rough Guide* on how to measure firms' financial constraints, Silva and Carreira (2012a) surveyed the existing methodologies, discussing the advantages and disadvantages of each one. The article was organized in order to facilitate the choice of the most appropriate technique for a research purpose and available data. In the present Chapter, we extend their work by reviewing and examining the validity of the most commonly used indices of financial constraints: (*i*) the KZ index (Kaplan and Zingales, 1997; Lamont et al., 2001), (*ii*) the WW index (Whited and Wu, 2006), (*iii*) the SA index (Hadlock and Pierce, 2010), (i*v*) the ASCL index (Mulier et al., 2016), and (*v*) the FCP index (Schauer et al., 2019). In doing so, we examine whether these indicators can be reasonably applied to a sample of unlisted firms. The main motivation for the selection of these indices is that they allow a both firm-specific and time-varying treatment of financial constraints and, as a consequence, they can be used either as dependent or explanatory variables by researchers.

Most of the existing empirical literature on firms' financial constraints deals with listed firms, often US firms, which are likely to be relatively less financially constrained, as they are typically large, mature and financially healthy companies with good credit ratings. Conversely, evidence on unlisted small and medium-sized firms (SMEs) is more scarce, even if they are particularly prone to informational asymmetries and thus to financial constraints and their investments account for the bulk of total investments in most countries (Carreira and Silva, 2010). In this Chapter, we explicit focus on unlisted SMEs by using a large panel of financial data on Portuguese firms, over 99% of which are not listed on the stock market.

The remainder of the chapter is organized as follows. We start in Section 2 with an overview of the (direct and indirect) measures of firms' financial constraints. Section 3 reviews direct measures, and Sections 4 and 5 present the credit rating and the most widely employed proxies, respectively. Section 6 reviews the most commonly used indices of financial constraints, while Sections 7 examines their validity on a large sample of unlisted firms. Finally, Section 8 presents some concluding remarks.