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# The structure of equity markets across countries: Scarcity and stock valuations



Matías Braun\*

Escuela de Negocios, Universidad Adolfo Ibáñez & IM Trust, Chile

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#### ABSTRACT

We build a dataset of the industrial composition of the stock market and the economy for 26 countries. This composition is far from representative of that of the economy, particularly in less-developed markets. Based on this, we build a measure of scarcity of investable securities and show that industries that are underrepresented relative to the economy exhibit higher valuations. Moreover, valuation differences are shown to be more important when informational issues make it more difficult for firms to get listed.

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#### 1. Introduction

In the classical tradition, the effect on prices of changes in the balance between supply and demand for financial assets is typically considered of second order. Most of the literature views assets as perfect substitutes with perfectly-elastic demand curves. This vision, however, was challenged by a literature documenting that changes in either demand or supply do affect prices. For instance, individual stocks that see their demand increase following the addition to an index exhibit abnormal positive returns (see Shleifer (1986) as an early reference). When emerging markets integrate to world markets their stock index goes up because they typically face an increase in demand due to their low world betas (Henry (2000)). The market price level tends to fall after periods of active issuance (Baker and Wurgler (2000)). Increases in the supply of individual securities, through the expiration of IPO lockup

E-mail address: Matias.braun@uai.cl

<sup>\*</sup> Tel.: +56 (2) 23311162.

periods, induce a fall in their value (Ofek and Richardson (2001)). Across U.S. census regions, the price of stocks decreases with a measure of relative supply (Hong et al., 2008). Large IPOs in emerging markets reduce the stock price of firms that are closer to them (Braun and Larrain (2009)). Moreover, the phenomenon is not confined just to equity but also extends to fixed-income securities (Newman and Rierson (2004)).

Given the results above it is natural to ask whether valuations are dependent on the structure of equity markets. As pointed out by Roll (1977), the equity market portfolio is not the true total wealth portfolio but just a proxy of it. It does not contain all the assets representative of flows in the economy because there is no supply of financial claims to each one of them.

To see whether this conjecture has empirical content we see if securities that are scarce in a particular market exhibit higher valuations. We build a dataset by putting together stock market and production figures for 10 sectors in each of 26 countries observed annually from 2000 to 2009. Merging an economy-wide and a stock market database is not regularly done. The industrial composition varies considerably across countries, being sometimes far from representative of the underlying economy (Astudillo et al., 2011). We take advantage of this fact and compute a scarcity measure which is the ratio of the weight of an industry in the entire economy over its proportion in the stock market. We find a positive relation between valuations and scarcity that is strong statistically and important in economic terms. An increase in our measure of scarcity from the 10th to the 90th percentile is associated with a 9.7% and 13.4% increase the ratio of price to book and price to earnings of the average firm in the industry, respectively.

Now, if listed firms in industries with limited supply fetch higher valuations this should induce privately-held firms in the same industry to go public. That is, supply would increase to eliminate the differences in relative valuations. However, if supply is for some reason constrained, there would be no reaction and no convergence of prices. One obvious candidate for constraints on supply is the role of information asymmetry and agency. We show that the discrepancy between the share of a sector in the stock market vis-à-vis its weight in the economy is negatively correlated to proxies for the quality of the informational environment and investor protection in the country. Moreover, valuation differences are shown to be more important where information asymmetries make it more difficult for firms to get listed. In particular, the correlation is stronger for industries with smaller firms, especially when located in less financially-developed markets that are characterized by poor disclosure rules, less reliable accountancy, and weak protection to investors. In support of the mechanism we propose, the number of firms is also shown to grow less in the underrepresented sectors, especially in those that are more affected by these same constraints.

Most of the related literature relies on experiments at the individual stock level, very often in a particular country. We study industries and show that these issues are relevant in the aggregate as well. Moreover, the effects are not a peculiarity of a few (generally rich) places but are found systematically across many markets. We also extend the financial development literature by showing that the lack of information and protection not only is related to the size and depth of equity markets but also to their composition and pricing.

The flipside of our approach based on industries is that the scope for endogeneity is greater. Indeed, scarcity may partly be a consequence of market valuations. The industrial composition of the economy, investors' choices, information asymmetry, and the structure of the stock market might be simultaneously determined. We can ease somewhat the concern that an important omitted variable is driving both valuations and scarcity because our panel data allow us to control non-parametrically for a number of other characteristics, including country and industry ones (that can even vary in time). We also provide evidence of the mechanism we postulate by linking it to supply restrictions. Some of these restrictions are less likely to be endogenous, such as the size of the typical firm in the industry or whether the sector is regulated or is an industry that produces consumer goods. Since tackling the issue completely is difficult given the space constraint, at this point we do not wish to claim to have established a causal effect going from scarcity to valuations. We just argue that there is a pervasive correlation that is consistent with our hypothesis that deserves to be studied in more detail.

In Section 2 we comment on the data and methodology. Section 3 presents the results. We conclude in Section 4.

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