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## Review of Economic Dynamics

[www.elsevier.com/locate/red](http://www.elsevier.com/locate/red)Brand capital and firm value <sup>☆</sup>Frederico Belo <sup>a,b,\*</sup>, Xiaoji Lin <sup>c</sup>, Maria Ana Vitorino <sup>a</sup><sup>a</sup> University of Minnesota, Carlson School of Management, 321, 19th Avenue South, Minneapolis, MN 55455, United States<sup>b</sup> NBER, United States<sup>c</sup> The Ohio State University, Fisher College of Business, 2100 Neil Avenue, Columbus, OH 43210, United States

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## ABSTRACT

We study the role of brand capital – a primary form of intangible capital – for firm valuation and risk in the cross section of publicly traded firms. Using an empirical measure of brand capital stock constructed from advertising expenditures accounting data, we show that: (i) firms with low brand capital investment rates have higher average stock returns than firms with high brand capital investment rates, a difference of 5.2% per annum; (ii) more brand capital intensive firms have higher average stock returns than less brand capital intensive firms, a difference of 5.1% per annum; and (iii) investment in both brand capital and physical capital is volatile and procyclical. A neoclassical investment-based model in which brand capital is a factor of production subject to adjustment costs matches the data well. The model also provides a novel explanation for the empirical links between advertising expenditures and stock returns around seasoned equity offerings (SEO) documented in previous studies.

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## 1. Introduction

The value of a corporation reflects the value of its physical capital stock (e.g. machines, plants), as well as the value of its intangible capital stock (e.g. employee skills, brand name, customer base). As documented in [Hall \(2001\)](#) and [McGrattan and Prescott \(2000\)](#), intangible capital is an important component of aggregate stock market value, and this importance has significantly increased in the last decades. Thus, understanding the effect of intangible capital on firms' performance is an important question which can help us understand the economic determinants of firms' market values. In this paper, we study a specific form of intangible capital, brand capital, and evaluate its effect on firm's risk (expected stock returns) in the cross section of publicly traded firms, both empirically as well as through the lens of a neoclassical investment-based asset pricing model.

Brand capital is an intangible asset that summarizes consumers' awareness of the goods and services produced by a firm. In the spirit of [Griliches \(1979\)](#), we interpret brand capital stock as a factor of production in the firm's operating profit function because it helps firms increase sales through, for example, increased customer loyalty or visibility. In addition,

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brand capital allows firms to differentiate their goods and services from those of competitors and thus it is a potential source of competitive advantage. Through its effect on cash flows, the brand capital stock is likely to affect the risk properties of the firm, and hence its cost of capital and market value.

Being an intangible asset, a firm's brand capital stock is naturally difficult to measure. To construct this variable, we interpret firms' advertising expenditures as investment in brand capital. These expenditures, which at the aggregate level represent about 5% of annual GDP in the U.S. economy (Arkolakis, 2010), include the cost of advertising media and promotional expenses and thus are a natural form through which firms affect brand awareness.<sup>1</sup> Following the literature on intangible capital, we then construct a firm-level measure of brand capital stock from advertising expenditures accounting data using the perpetual inventory method. We use this measure to investigate the link between brand capital and stock returns in the data.

Our main empirical findings can be summarized as follows. First, firms with low brand capital investment rates (low advertising expenditures) have higher average stock returns than firms with high brand capital investment rates (difference of 5.2% per annum). We interpret the difference in average stock returns between firms with different brand capital investment rates as reflecting a compensation for differences in macroeconomic risk of these firms. Supporting this hypothesis, we show that a conditional version of the capital asset pricing model explains a large fraction of the cross-sectional variation in the average returns of firms with different brand capital investment rates. In addition, we show that the cash flows of firms with low brand capital investment rates are relatively more cyclical.

Second, we document that more brand capital intensive firms, i.e. firms with higher stock of brand capital per employee, have higher average returns than less brand capital intensive firms (difference of 5.1% per annum). Finally, we show that advertising expenditures and physical capital investment have similar properties, consistent with interpreting advertising expenditures as an investment. Both series are volatile (especially brand capital investment) and procyclical.

To interpret the empirical findings, we incorporate brand capital into an otherwise standard neoclassical model of investment. We then use the model as a laboratory to understand the economic mechanism driving the empirical facts documented here, as well as to interpret the link between advertising expenditures and seasoned equity offerings (SEOs) documented in previous studies (and discussed below).

The model features a large cross section of firms. Each firm produces a differentiated good and is subject to a firm-specific and an aggregate productivity shock. Firm managers make advertising and physical capital investment decisions to maximize the value of the firm for shareholders. Advertising expenditures create brand capital which is a productive asset because it increases consumers' willingness to pay for the firm's good.

There are two frictions in the model: adjustment costs for both brand capital and physical capital, as well as costs of issuing new equity (external finance). The costs of adjusting physical capital and issuing new equity are standard. In addition, changing the stock of brand capital is costly because the planning and execution of advertising activities (even if outsourced) takes away resources from the firm's other productive activities, and is also typically associated with promotions and discounts. At the same time, it is difficult for firms to downsize by selling their brand(s) names. Because brand capital is costly to adjust, installed brand capital contributes to the firm's total market value.

Our analysis shows that the investment-based model augmented with brand capital replicates well both the asset pricing facts and key properties of brand capital and physical capital investment rates with reasonable parameter values. This result depends crucially on the existence of brand capital adjustment costs. Without these costs, brand capital investment (advertising) is too volatile (329% in the model versus 37% in the data). In addition, the average return spreads are tiny when compared with those in the data across both the brand capital investment portfolios (1.8% in the model versus 5.2% in the data), and the brand capital intensity portfolios (1.5% in the model versus 5.1% in the data).

In the model, the negative relationship between firms' brand capital investment rate (advertising expenditures) and future stock returns arises endogenously in the cross section due to differences in firms' productivity, and is amplified by the costs of adjusting the capital stocks. Investment is procyclical, and thus high productivity firms advertise and invest more than low productivity firms. In addition, high productivity firms produce relatively more output and have higher profits, and thus are less affected by adjustment costs. This gives these firms more flexibility to adjust their effective cash flows to shareholders over time in response to aggregate shocks. As a result, the value of high productivity firms is affected relatively less than the value of low productivity firms after large negative productivity shocks, that is, in bad economic times when the price of risk is high. The high productivity/high advertising firms are thus less risky and hence have low expected stock returns in equilibrium, consistent with the empirical results reported here. This mechanism is also consistent with the empirical findings in Imrohroglu and Tuzel (2012), who show that more productive firms earn lower average stock returns in the U.S. economy.

Analogously, brand capital intensive firms are low productivity firms with a stock of brand capital that is too large relative to their labor force. These firms want to reduce their size because of their lower productivity, but the irreversibility of the brand capital stock, together with the cost of reducing the stock of physical capital, makes it costly to downsize. Because of the reduced ability of these firms to adjust their effective cash flows to shareholders over time in response to aggregate shocks, these firms are more risky and thus have higher expected returns in equilibrium.

<sup>1</sup> See, for example, Bagwell (2007) for a detailed discussion of alternative economic explanations for why consumers respond to advertising.

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