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Quantifying nation equity with sales data: A structural approach

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ABSTRACT

Nation equity refers to a product's equity that is associated with its country of origin (COO). Generalized COO effects have previously been studied through experiments and surveys and measured by quality perception, product attitude, and purchase intention. We propose a structural equilibrium approach to assessing the additional market power COO offers, monetizing nation equity with product sales data, and computing the price premiums and discounts associated with nation equity. We apply this approach to China's personal computer market between 1995 and 2008 and find that COO does generate additional market power and affects firm markups. We find nation equity to be pervasive, significant, and multidimensional, and it evolves over time, but there is no simple correspondence between market share and nation equity. Large market shares do not necessarily mean positive nation equity and price premiums, negative nation equity and price discounts can evolve into positive nation equity and price premiums, and vice versa. We discuss the implications of our modeling approach and our findings for emerging markets in general, and for China in particular.

1. Introduction

Nation equity refers to a product's equity or its goodwill associated with its country of origin (COO). Generalized COO effects include performance-based effects and normative effects (Maheswaran & Chen, 2006, 2009). Performance-based effects refer to the effects of performance-related country associations on product evaluations (Bilkey & Nes, 1982; Peterson & Jolibert, 1995; Verlegh & Steenkamp, 1999), while normative effects refer to non-performance-related country perceptions, such as the general foreignness effect (Schooler, 1971), normative ethnocentrism (Shimp & Sharma, 1987), and emotional animosity (Klein, Ettenson, & Morris, 1998; Klein, 2002).

Nation equity has been studied primarily with laboratory and survey data and measured by quality perception, product attitude, and purchase intention. Because product attitude and purchase intention do not perfectly predict purchase behavior (Chandon, Morwitz, & Reinartz, 2005), it is important that COO effects and nation equity be investigated with revealed preferences. We propose a structural approach to assess the additional market power that COO offers, to monetize nation equity with sales data, and to compute the associated price premiums and price discounts. We measure nation equity as the difference in the aggregate profits of a country's manufacturers when a product has a COO versus when it does not, after controlling for the effects of search attributes, brands, and brand-associated non-search attributes. Because we use product sales data, our measure of nation equity reflects the actual choices of consumers and the interactions among and within manufacturers and retailers (Sudhir, 2001; Chu, Chintagunta, & Vilcassim, 2007; Chu & Chintagunta, 2009; Chintagunta, Chu, & Cebollada, 2012). This approach has been used to measure brand equity with transactional data (Goldfarb, Lu, & Moorthy, 2009).

We apply this structural approach to China's personal computer (PC) market, which contains products from many countries and regions. Using fourteen years of sales data, we obtain interesting insights about the value and dynamics of the COO effect and nation equity in this market. First, we find that COO generates additional market power and significantly affects firm profits. Second, we find nation equity in China, an increasingly globalized and digitized country, to be pervasive and significant, which is contrary to the argument that the COO effect diminishes with globalization and digitization (Samiee, Shimp, & Sharma, 2005). Third, for the first time in this field, we quantify the monetary value of nation equity and compute price premiums associated with positive nation equity and price discounts associated with negative nation equity. We find no simple correspondence between market share and nation equity. Products with a high (low) market share do not necessarily possess positive (negative) nation equity. Fourth, we study the evolution of nation equity, which is difficult and expensive, if not impossible, to accomplish via surveys and experiments. Fifth, we empirically demonstrate the multidimensionality of nation equity in the same market, with different dimensions dominating in different countries. This paper complements the literature on the COO effect by bringing the monetary dimension of nation equity into the picture and studying its magnitude, pattern and evolution with sales data.

The proposed structural approach to quantifying nation equity can be applied to markets such as the European car market where multiple-country ownership of the same brands is prevalent (Brenkers

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& Verboven, 2006). It can be applied to markets such as steel, telecommunications, pharmaceuticals, oil and gas, computer programming and data processing services, advertising services, and insurance, securities, banking and financial services where cross-border mergers and acquisitions (M&As) are common (Kang & Johansson, 2000; Evenett, 2004; Kiene, Helin, & Eckerdt, 2011; Edelstein, Qian, & Tsang, 2011). The approach can also be applied to markets where COO effects dominate and brand effects can be subdued. In markets where both nation equity and brand equity are important and few cross-border M&As are observed, the approach can help to quantify relative nation equity and brand equity. The minimum data required are the sales and prices of products/services from different countries, which have been collected in many markets by various governments, organizations, and agencies.

For emerging markets, building strong nation equity is important both for sustaining domestic consumption and for boosting overseas demand. With economic development and income growth, more consumers in emerging markets start to value product quality. They often perceive products from developed economies to be of higher quality than domestic brands. A recent article in the wsj.com (2012) reports that because of repeated scandals on product quality and safety and because of their increased income, Mainland Chinese consumers have started to loathe “made in China” and cherish imported goods, even though they have a strong desire to support national brands and economy (McEwen, 2007). Mainland Chinese enterprises' poor performance in brand-building within China has hampered their pace of overseas expansion, even though they have been vying for global markets and global business leadership. Therefore, firms in emerging markets need to focus more on product quality and brand-building to increase their competitive advantage. Our approach to analyzing and interpreting nation equity is particularly useful for governments and enterprises in emerging markets. They are interested in establishing national brands but often mistake products with a high market share as having a high level of equity and thus adopt a low-price strategy to boost the market share of their national brands. Our analysis indicates that a high market share does not imply a high level of nation equity or price premiums. Therefore, our approach can help these governments and firms to better understand the true value of their national brands so that they can adopt measures to enhance their value.

The rest of the paper proceeds as follows. We set up our research framework in Section 2 and summarize the data in Section 3. We describe the econometric model in Section 4 and the estimation and identification in Section 5. We detail the main findings in Section 6 and discuss the managerial implications in Section 7.

2. Research framework

The literature has identified the cognitive, affective, and normative roles of a product's COO in product evaluation and purchase intention (Obermiller & Spangenberg, 1989; Maheswaran, 1994; Gürhan-Canli & Maheswaran, 2000; Batra, Ramaswamy, Alden, Steenkamp, & Ramachander, 2000). A COO can signal overall product quality, as well as specific quality attributes, such as reliability and durability (Li & Wyer, 1994). COOs can have emotional and symbolic value to consumers, including social status and national pride (Botschen & Hemetsberger, 1998). They can link products to a rich set of product images, with sensory, affective, and ritual connotations (Askegaard & Ger, 1998). COOs can also impose social and personal norms on consumers, such as consumer ethnocentrism (Shimp & Sharma, 1987) and consumer animosity (Klein et al., 1998; Klein, 2002). These prior studies confirm the value of COOs to consumers and their effects on different dimensions of demand, such as a consumer's willingness to pay and choose certain products, which directly affect firm profits. Thus, when quantifying the value of nation equity, we need to account for the effects of COOs on both the demand side and the supply side.

A product is a combination of many aspects: its COO, brand, search attributes, and non-search attributes, such as emotions, culture, trust, imagery, personality, experience, and credence. Some non-search attributes are associated with a product's brand and become essential inputs for brand equity (Erdem & Swait, 1998; Keller, 2003; Goldfarb et al., 2009), while some non-search attributes are associated with its COO (Verlegh & Steenkamp, 1999; Maheswaran & Chen, 2009). When a product is shorn of its COO, it still maintains its search attributes, brand name, and brand-associated non-search attributes. These remaining attributes can generate demand and bring profits to a firm. When measuring the value of a product's COO or its nation equity and the additional market power it generates, we need to control for the effects of these attributes. Therefore, we propose to use a structural approach and counterfactual experiments to quantify nation equity and its market power.

When setting wholesale and retail prices, manufacturers and retailers consider the various attributes of products: their COO, brand, search attributes, and non-search attributes. Consumers use these same attributes when deciding which products to purchase to maximize the utility they obtain from the products. The prices of products and their sales volumes affect the profits that firms receive. The aggregated profits of individual firms form a country's actual profits. When a product's COO is removed, the COO-associated non-search attributes also disappear. Manufacturers and retailers then set their prices based

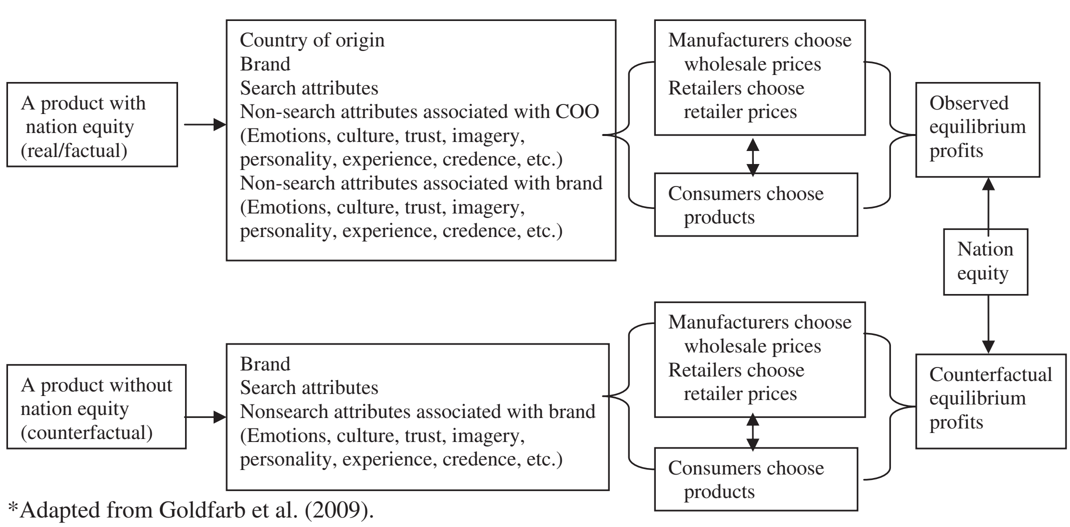

Fig. 1. A framework for quantifying nation equity.
Adapted from Goldfarb et al. (2009)