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Brands as Productive Assets: Concepts, Measurement, and Global Trends

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Abstract

The paper measures and analyzes brands from an economic (i.e., intangible capital) point of view. First, we define concepts and set out this approach. We describe that a productive role for brands is consistent with assumptions used in the economic analysis of innovation (product differentiation and market power, as in Romer (1990) and implicit in the intangibles framework of Corrado, Hulten, and Sichel 2005, 2009). Second, we analyze the conditions under which brands are long-lived productive assets and contribute to economic growth. Third, we review and improve the measurement of investment in brands. We develop (1) a new U.S. series for brand investment to cover all marketing, including "in-house" investment, and (2) a harmonized global indicator of brand investment covering 64 countries.

We find that the conventional measure misrepresents the trend of brand spending in the U.S., because the conventional measures includes mostly what companies paid for advertisement which declined since 2000, while companies have increased spending social media and strategic marketing which are mostly developed in-house. Moreover, we estimate the world invested $417 billion or .59 percent of world GDP in brands in 2011. We find that brand investment is positively correlated with the level of economic development measured by GDP per capita, and that as countries double their real GDP per capita, brand investment as a percent of GDP increases 0.3 percentage points. And an analysis of economic growth finds that the contribution of brand is comparable to that of R&D in most advanced economies.

Acknowledgements

We have many individuals to thank.

Sacha Wunsch-Vincent, Senior Economic Officer in the Economic and Statistics Division of the World Intellectual Property Office is responsible for determining the broad subjects explored in this report. At each step of this project he pushed for new thinking and empirics for a global analysis of brands. Tony Clayton, Chief Economist of the UK Intellectual Property Office offered comments and suggestions on an earlier draft and helped shape our thinking on the relationship between brands and innovation. Jim Gregory, Chief Executive Officer of CoreBrand and a pioneer in the quantitative of brand values graciously shared insights from his more than twenty years of work in the area. We are deeply indebted to all three.

On the data side, we are indebted to Tsutomu Miyagawa of Tokyo University for data on intangible investment in brands and growth accounting results for brand equity in Japan (based on Miyagawa and Hisa 2013). Corrado is grateful to her collaborators, Jonathan Haskel of Imperial College, London, and Cecilia Jona-Lasino and Massimiliano Iommi, both of ISTAT and LUISS, Rome, for permission to use growth accounting results for Europe from their joint work (Corrado et al. 2013). These and the other results in this report draw upon the intangible investment series in the Japan Industrial Productivity (JIP) and INTAN-Invest databases, which are freely available.[1] Estimates for China and some details for the United States reported herein are based on The Conference Board's unpublished research.

All errors are our own.

Authors

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[1] Their URLs are http://www.rieti.go.jp/en/database/JIP2012/index.html and http://www.intan-invest.net , respectively

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Brands as a Productive Asset of the Firm: Concepts, Measurement, and Global Trends

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Overview and summary

Brand equity and brand strategy are business concepts born in the 1980s, despite the fact that branding activity (e.g., by merchant traders and pottery makers) goes back 5000 years. The concepts gained swift acceptance in the management and marketing literature, and the notion that brand equity represents an intangible asset of the firm and that building brand equity is a strategy for firms to differentiate its products and services from competitors was well established by the early 1990s.

A brand can be defined literally following the American Marketing Association ("a brand is a name, term, sign, symbol or a combination of them, intended to identify the goods and services of one seller or a group of sellers and to differentiate them from their competitors"). Or it can be defined from an economic point of view as in this report—as an intangible asset of the firm.

Brands are, then, productive assets in an economy. As some economists dispute this position (although few in business would!), we review the analysis and arguments that support the view of brands as productive assets. We also review how brands are related to innovation, economic growth, and productivity, and we report sources-of-growth results for selected countries.

In our analysis of the impact of brands on economic activity, we depart from the existing

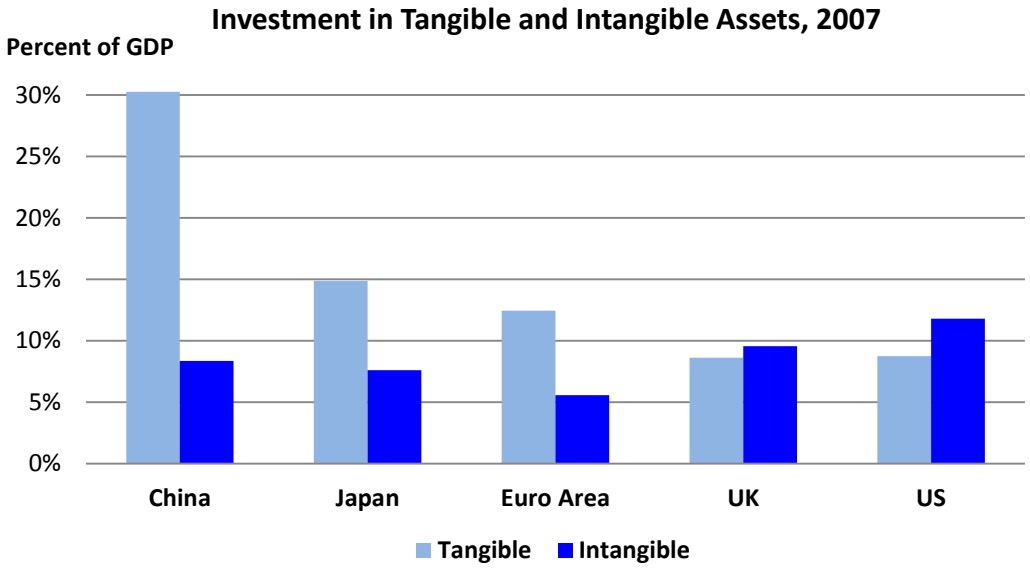
Why consider intangible capital?

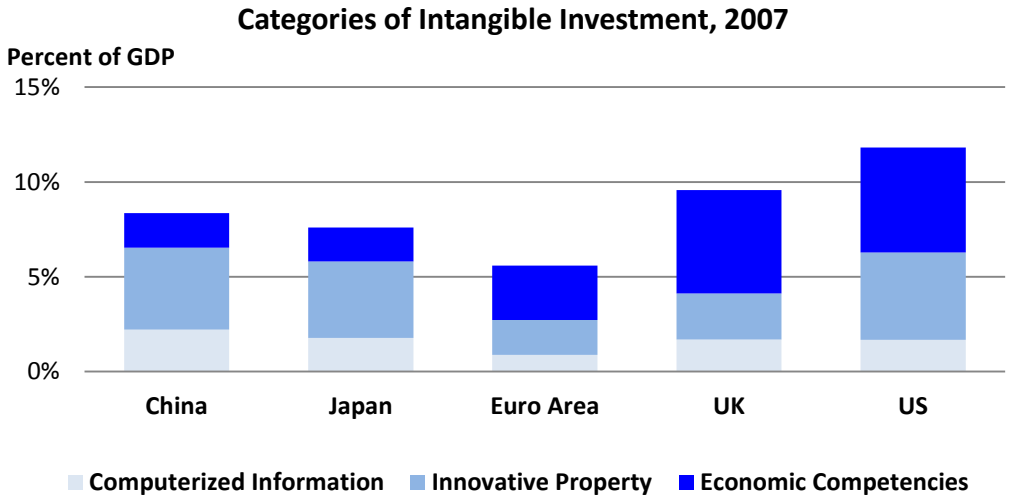
A company's expenditures on product design, marketing and customer support, and human capital and organizational development are essential inputs to innovation along with spending on R&D. All these innovation-related expenditures **(**collectively termed "intangibles"**)** are investments of businesses and need to be included in GDP as business investment.

Available estimates suggest intangible investment is larger than tangible investment in some countries, e.g., the UK and United States (upper panel of figure 1). And the broad category of intangible investment that includes brand equity (economic competencies) is the largest component of intangible investment for Euro Area countries, the UK and the United States (lower panel of figure 1).

The propensity to invest in intangibles in Japan and China is about the same as in the Euro Area, but the composition is tilted more toward innovative property (which includes R&D) in Japan and China.

Figure 1. Perspectives on Intangible Investment





Note. Euro Area excludes Luxembourg.
Sources. Authors' elaboration of data sources listed in Acknowledgements.

intangible literature in two important ways. The first is that we define the brand equity component of intangible capital to include strategic marketing. In the existing intangible literature, strategic marketing is in another asset category, organizational capital. Although this change, alone, implies very little for the prevailing concepts and *overall* magnitudes in the intangible capital literature, the change is a major refinement to concepts and empirics that focus on the impact of brands, as we do in this report.

The second departure involves interpretation of standard sources-of-growth empirics. Consider the definition of brand—*an intangible asset that depends on an association made by consumers*—and its more precise form, an asset that reflects *customers' implicit valuation of the revenue stream that accrues to a firm from its brand name(s)*. Now consider that investments in brand are usually measured as promotion expenditures, and that brand equity measured using standard growth accounting techniques reflects the cumulated value of those investments. A disconnect is then obvious: *all* customer-facing aspects of a firm's performance have an impact on brand equity valuation (product quality, product cost, after-sale service, etc.), not just its investments in brand.

We report estimates of the contribution of value of brand equity grounded in standard growth accounting methods in this report, recognizing that they likely miss the component of brand equity that stems from the dynamic interaction of companies' names with their performance. The dynamic interaction of brands and, for example, R&D, suggests that investments and/or innovation in the marketing and R&D business functions may be correlated, an association for which we find some support in recent data for Europe and the United States (figure 2).

Why aren't investments in brand capitalized in national accounts?

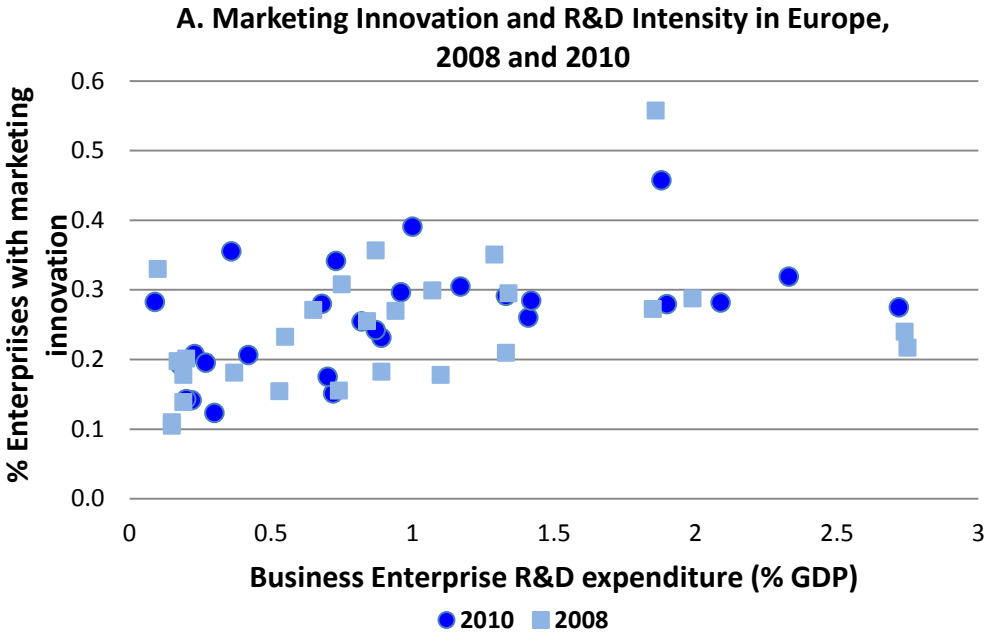
International standards call for R&D to be capitalized in national accounts. Why not brand equity too? Answer: the "zero-sum" argument, a view that holds that the main impact of investments in brand is on market shares *within* an industry or *between* product classes that are close substitutes. In other words, there is no net creation of information and thus no net revenue stream associated with brands in an economy.

Our rebuttal consists of four major points. Perhaps the most powerful is that there is no dispositive body of evidence supporting the zero-sum view, and what does exist supports the "informative" view of advertising.

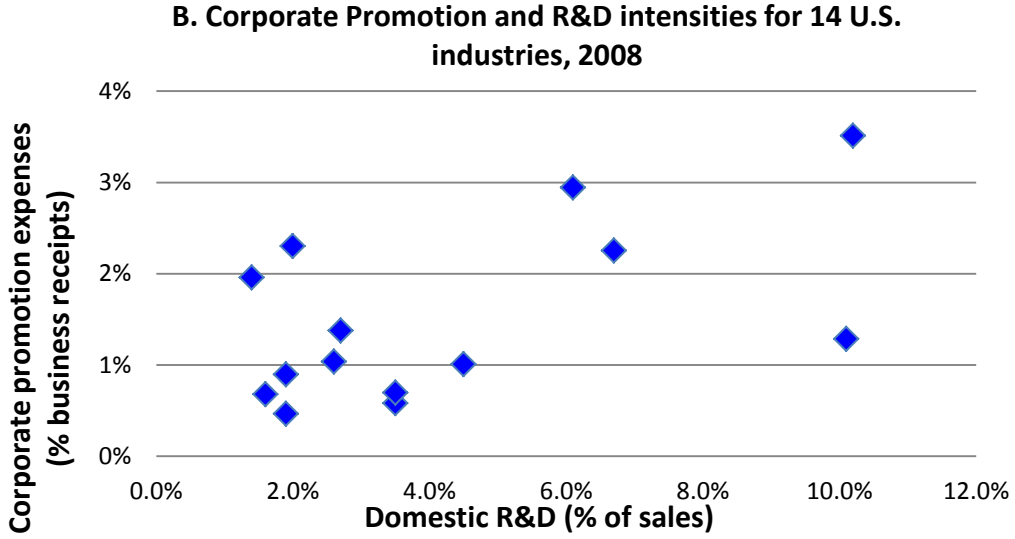
Equally compelling is that the zero-sum view is grounded in a model of static perfect competition whereas innovation conveys market power, often in the form of pricing power that goes with strong brand. Furthermore, strong brands enable firms to be better placed in taking new innovations to market. Brands and the pricing power conveyed by them are thus part of a dynamic competitive growth process (not a static competitive no-growth one).

That said, in the high-income economies of Europe, Japan, and the United States, the conventionally calculated contribution of brand equity to the growth of output per hour ranges

Figure 2. Marketing and Promotion vs. R&D Intensity



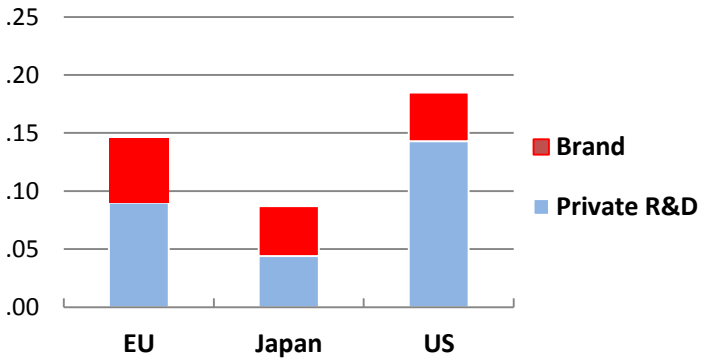
Source—Authors' elaboration of information from BERD and Community Innovation Surveys for 28 European countries (Eurostat).



Source. Authors' elaboration of data from Science and Engineering Indicators (2012) and data compiled by the authors from the U.S. IRS *Statistics of Income*, Corporate Tax Reports. Nonzero values for R&D performance as a percent of sales (R&D performers only) for 29 industries are considered, from which the bottom quartile of R&D performers (ratios less than 1.3 percent) is excluded.

from .04 percentage points per year in Japan and the United States to .06 percentage points per year in 12 advanced European countries (1995 to 2007).[2] The direct contribution of brand (as currently measured) is almost as large as the direct contribution of private R&D in Japan and high-income Europe (figure 3).

Figure 3. Existing Estimates of Brand
Percentage point contribution to growth in output per hour, 1995 to 2007

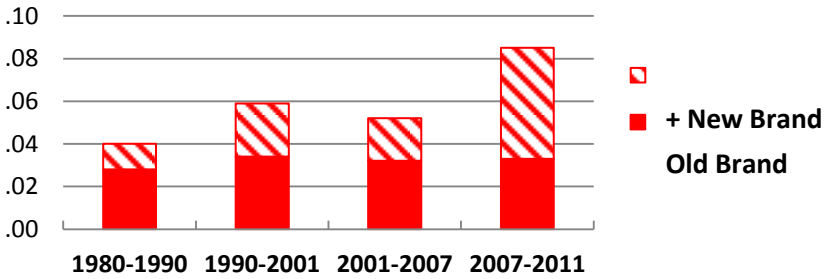


Source--Corrado et al. (2013) based on INTAN-Invest and Miyagawa and Hisa (2013); reproduced as table 2 of this report.

Next we explore measurement. We find, to no surprise, that marketing, marketing research, and advertising expenditure according to medium are undergoing structural change. Broadly speaking there are two trends: one is the growth of strategic marketing within firms, which seems to go along with the growth of "content" marketing, a type of branding that is notable in its heavy use of in-house talent and social media. The second is the impact of the Internet (and now mobile and digital video) on advertising media expenditure *per se*.

In the United States, we estimate that in-house business investments in marketing grew faster than nominal GDP during the Great Recession and its aftermath (3-1/2 percent per year from 2007 to 2011, 1-3/4 percentage points faster than nominal GDP), whereas advertising media expenditure (part of which also contributes to investments in brand) *dropped* 3.3 percent per year and currently (2012) stands 8-1/2 percent lower than in 2007.

Figure 4. New U.S. Brand Series
Percentage point contribution to growth in output per hour



Source--Tables 4 and 6 of this report.

The development of estimates for brand investments within firms for the United States, the "in-house" marketing estimates just mentioned are new with this report, and all told the *new series* for U.S. brand investments is about 60 percent larger than in the internationally comparable INTAN-Invest database (1995-2010).

[2] The countries are as follows: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, and United Kingdom

Accordingly, the contribution of brand investment to productivity growth is about 60 percent higher—and more so in recent years (figure 4). Indeed, without this advance in measurement, a literal read of recent trends could be misleading: The new series for U.S. business brand investment vs. U.S. business advertising media expenditure send very different signals after 2004.

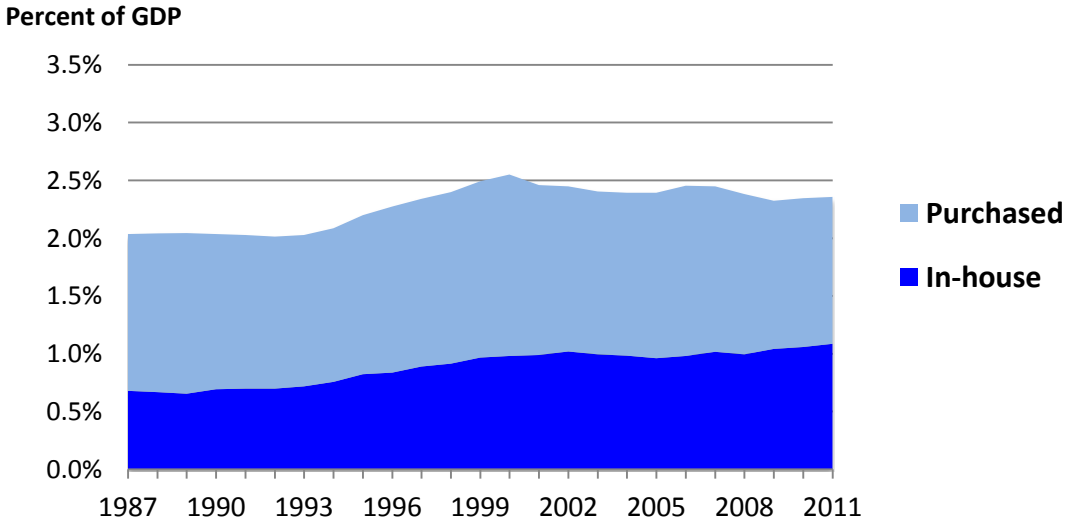
Why a new series for brand Investment?

Short answer: Structural change due to growth of strategic marketing and the Internet. Because marketing is part of both the internal workings of firms as well as part of their purchases, we need two components to capture brand investment, one to capture the in-house investments that firms make in their brands, and another to capture purchased brand services. Figure 5 shows estimates of these components of brand investment for the United States.

This new series for in-house investment grows 7 percent per year over the period shown, compared with 4.7 percent for the purchased component. The in-house series is estimated using information on compensation and employment in marketing and marketing-related occupations (figure 6, upper panel).

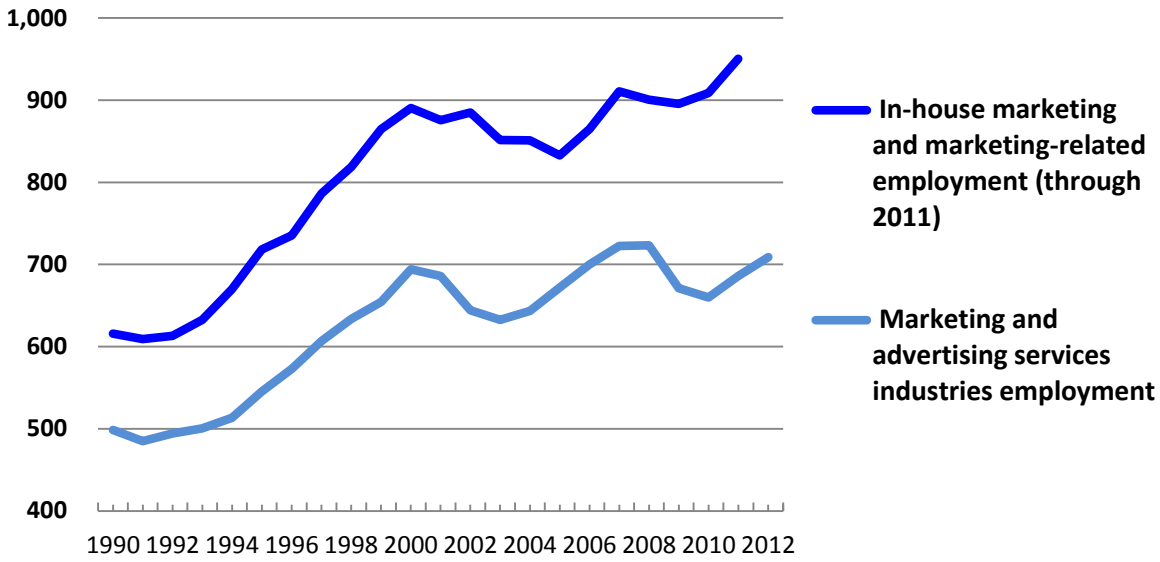
The purchased component grows more slowly because firms have cut back on purchased advertising services as internal marketing departments have been beefed up. But within the purchased component, the downtrend in purchased *advertising* services is partially offset by very rapid growth in purchased *marketing consulting* services (figure 6, lower panel).

Figure 5. Components of New Series for U.S. Business Brand Investment, 1987 to 2011

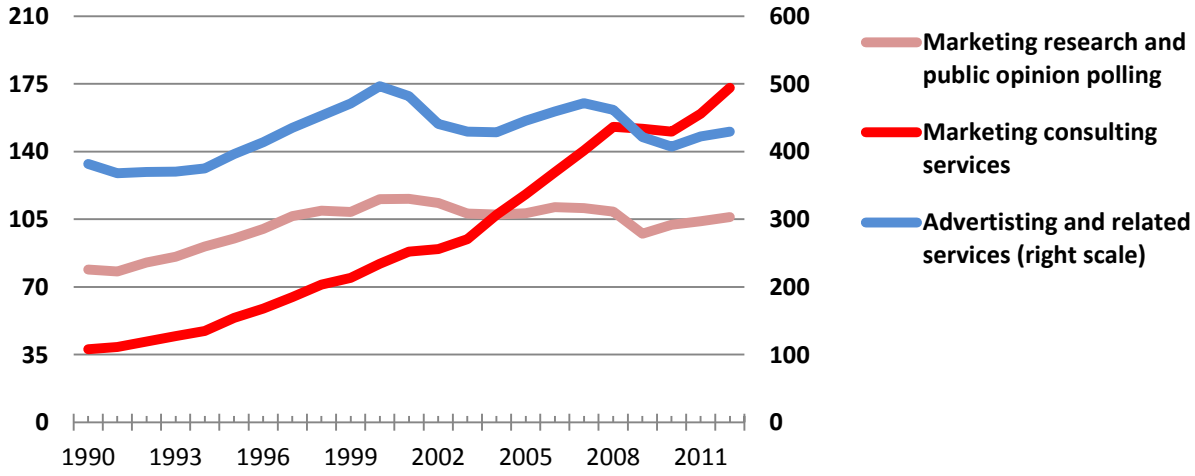


Source. Section 3 and appendix to this report.

Figure 6. Brand-related Employment in the United States, 1990 to 2012



Components of Marketing and Advertising Services Industries



Sources. In-house, this report; marketing and advertising services industries, U.S. Bureau of Labor Statistics. In-house excludes sales and telemarketing workers; marketing and advertising services industries excludes telemarketing bureaus.

In seeking to develop improved measures of brand equity as an intangible asset, we also review what is known about its durability. We draw upon an important lesson we learned from practitioners who look at brand equity from a financial market point of view, namely, the distinction between corporate brands and product brands. We also draw considerable support from the emerging survey work on intangible assets in the United Kingdom. Additional research on this important topic is vitally needed, but based on the analysis and information gathered in this report, we recommend lengthening the usual assumption for the service life of investments in brand by 1/3, from three to about four years.

Finally, we offer a global perspective on brand investments using comparable indicators. The indicators we use are advertising media expenditure and market research expenditure, combined as in the existing intangible capital literature to yield internationally comparable estimates of the purchased component of these investments in brands. Although an imperfect measure of brand investment (as per arguments in this report, namely, that strategic marketing investments, including those *inside firms*, are ignored), we use it to examine recent trends and explore the relationship between the rate of brand investment and level of economic development. As may be seen in figure 7, according to this indicator, brand investment as a percent of GDP in high-income countries dropped off with the onset of the Great Recession and moved sideways since then. Investments in middle-and-low countries are little changed relative to GDP since 2007.

What's the difference between corporate and product brands?

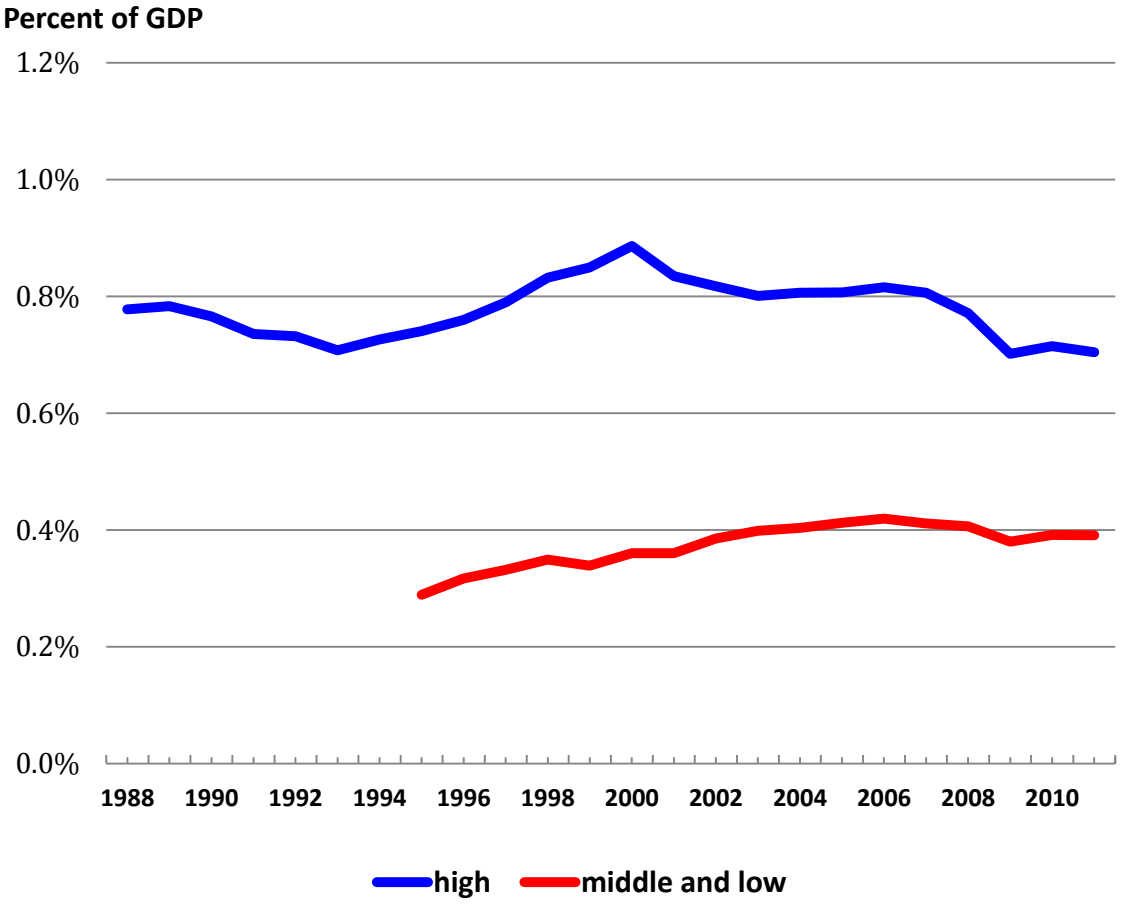
Product brands and corporate brands are not necessarily the same. A corporate brand is related to almost everything happening in the company, including advertising, product packaging, public relations, investor relations and employee relations.

Business processes, company culture, and company communications need to be aligned with brand to build reputation and create corporate value. According to Jim Gregory, CEO of CoreBrand, a company that measures corporate reputations in an annual survey, "Google's brand has been consistently growing for years. They are now ranked as the number one company to work for, and they have great programs in place to support this ranking — that is [alignment and] consistency [with brand]." Other examples of corporate brands are P&G, Philips, and Nestle. Many corporate brands have been around for 100+ years.

A product brand is closely related to product-focused marketing and sales used to generate revenues from specific products. Examples of product brands are Crest, Gillette, Tide, and Duracell (and all are product brands of P&G). A company may choose to brand its products with the corporate brand, as Philips usually does. Or a company could choose product brands that are different from the corporate brands, as P&G usually does.

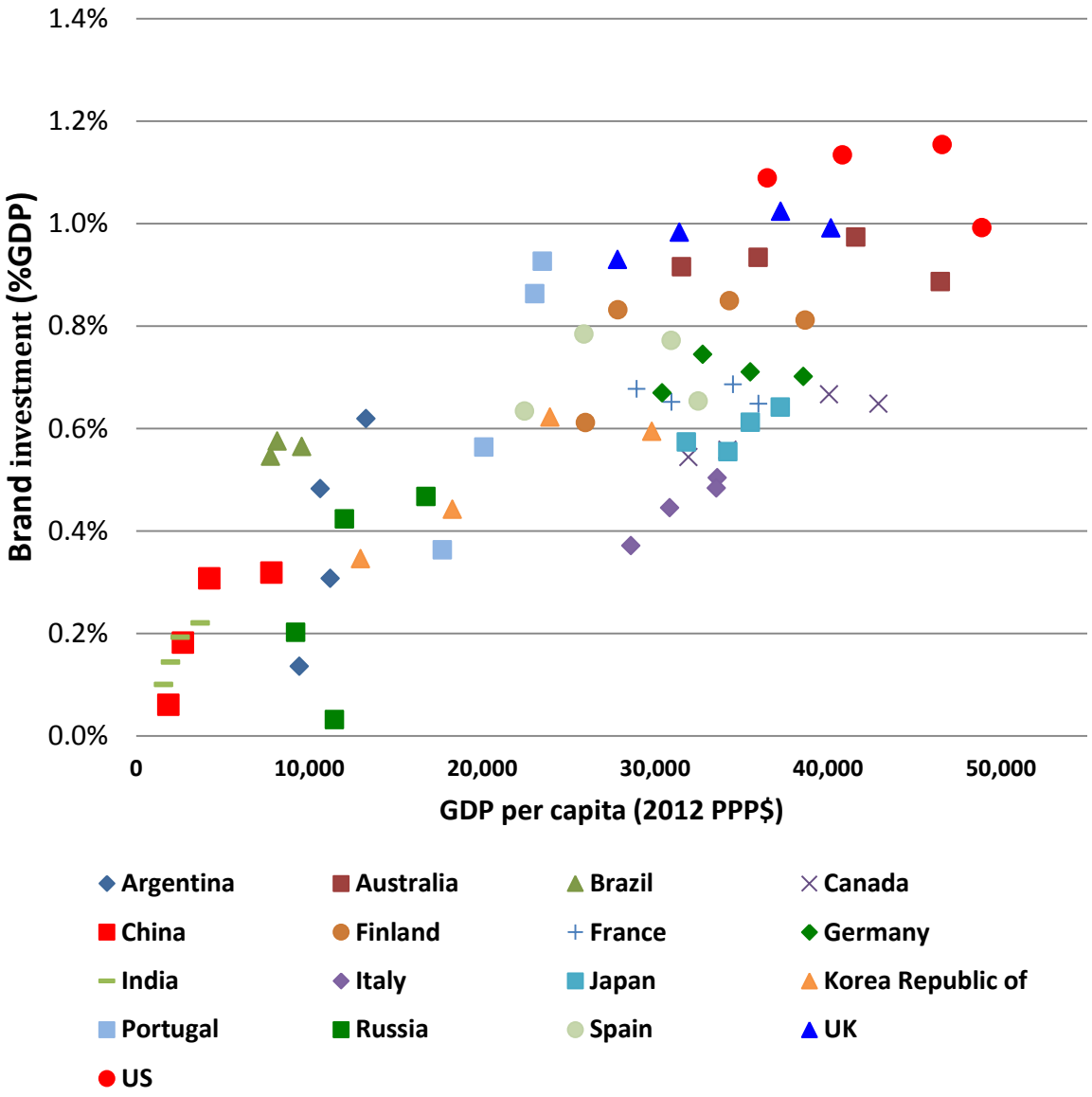
Although the distinction between corporate brands and product brands is important, the commonly available data are not rich enough to disentangle their respective influences. As a result, when researchers examine brands and spending on brands—especially when they attempt to estimate the effectiveness and longevity of advertising—they usually cannot capture the influence of corporate brands on product sales, making it difficult arrive at dispositive conclusions about the effectiveness and durability of investments in brand and brand equity.

Figure 7. Brand Investment Indicator, High and Middle-and-Low Income Countries, 1988 to 2011



Note. Purchased component indicator (excluding strategic marketing) using estimates for 52 countries for which sufficient time series observations are available for plotting for the period shown.
Source. This report. Series are calculated similarly across countries and do not incorporate this report's new U.S. series. Income groups use the World Bank classification.

Figure 8. Brand Investment Indicator for 17 Countries, 1988 to 2011



Note. Each country point averages 6 years of data (1988-1993, 1994-1999, 2000-2005, or 2006-2011). Series plotted is an indicator of purchased component (excluding strategic marketing).
Source. This report. Series are calculated similarly across countries and do not incorporate this report's new U.S. series. Real GDP per capita is from The Conference Board's *Total Economy Database*.

Figure 8 shows brand investment rates for 17 of the more than 80 countries in our database, each plotted according to the country's real GDP per capita. As may be seen, a strikingly positive relationship between brand investment and level of economic development emerges from these data. The finding is supported by econometric analysis using fixed effects that control for business cycle (i.e., time) and country characteristics. The underlying relationship is plausible for several reasons, among them that, as countries grow and develop from agrarian to dynamic innovative economies, markets cease to be local and companies must build reputation and brand awareness (see box for further discussion).

Branding activity increases so that information about producers and products and services can be communicated broadly to customers. Such information is necessary for firms *and* markets to grow, as per the dynamic relationship between firms' performance, branding, and economic growth described earlier.

In summary, we make, we believe, several contributions: First we underscore that the recognition of a productive role for brands is consistent with assumptions commonly used in the economic analysis of innovation, namely, product differentiation and market power—and that this implies an

Why a positive relationship between branding and economic development?

Many factors may account for the positive relationship seen in figures 8, the most natural of which are associated with the course of economic development. Here we boil them down to four:

The first is transportation infrastructure. At earlier stages of development most goods are produced and sold in local areas. As transportation becomes more possible and less costly, traded goods expand both in variety and volume (Hao 2007). Customers then need increased information on the quality and characteristics of goods produced outside of their local area, a situation that creates a need for advertising and brand building by producers and retailers.

Economies of scale in production also drive investment in brands. When a producer targets only a local market, the scale of production is restricted by the size of that market. But if the producer can sell products in different regions, including distant markets, the larger scale of production tends to lowers unit costs. In order to reach a large scale, producers need to expand their market share in new regions by researching the opportunities and building reputation and brand awareness.

The third and fourth factors are product differentiation and information asymmetries, which are both related to the nature of competition and innovation in modern market economies. Companies differentiate their goods from their competitors' goods along a continuum – via performance characteristics and introduction of new varieties or via introduction of entirely new goods that meet previously unmet needs. Companies build brand (and market share via customer loyalty) by signaling that the existing products and services they offer are high quality, and they reduce the information asymmetries between them and consumers in the case of new goods via the same tools. The creation of information for consumers via advertising in the case of new goods (and new varieties) is the classic case of "informative" advertising (Stigler 1961, Nelson 1970).

In sum, the presence of brand building is one of the key differences between modern market economies with dynamic innovation processes and agrarian and mercantilist ones.

important role for brands in dynamic competitive economies. We thus carry an important theme throughout the report, namely that competencies in many business functions, not just marketing, contribute to brand development.

All too often economists associate branding with the advertising of products. Rather, a company brand is built from a range of competencies that, along with marketing, determine its success.

Second, we develop new, more comprehensive time series estimates of brand investment in the United States and assemble, for the first time, internationally comparable data on advertising media spending and marketing research expenditure. In so doing we improve, in the first instance, on the scope of measures for investment in brands in the intangible capital literature. That said, our new figures are offered with humility, as the means and mechanisms firms use to communicate with customers continue to change as societal take-up of new technologies (mobile broadband, social networks, digital video) expands.

Finally, we show that across countries, brand investment is associated with the level of economic development. This cross-country pattern reflect many factors, including the course of economic development and globalization, but they also reflect the rapid spread of modern media and increasing customer sophistication in emerging economies.

We now set out the analysis that developed these findings.

Section 1. Concepts and approach

A *brand* is an intangible asset that depends on an association made by consumers.[3] The value of a firm's brand or brands is commonly called *brand equity*, and sometimes it is called brand and reputational equity to underscore its basis in customer perception. Brand equity can therefore be defined as an asset that reflects consumers' implicit valuation of the revenue stream that accrues to a firm from its brand name(s), mark, or logo.[4] The brands of a firm include its company name (or names) as well as the brand name (or names) of its products and services, a distinction we shall elaborate shortly.

A key feature of capital is that it is both a productive asset and a source of wealth. Because brand equity generates a revenue stream, it is a productive asset, or capital, of the firm. To be more precise, branding creates *information* about a firm and/or its products and services; the information flows from producers to consumers, *associated with a name*. The information accumulates as a *stock of knowledge* (about a product's existence, about a firm's characteristics, about a service's quality, etc.) that is appropriable by the firm.

From a *financial* market standpoint, then, the value of a firm reflects the aggregate earning power of its assets, both tangible and intangible—and brand equity is the capitalized value of the profits that result from associating a name with sales of certain (or all) products or services of the firm. Behind the association is a stock of information, or *stock of appropriable knowledge*. That is what we mean when we say that brand equity is a productive asset of the firm.

As this brings us full circle, we turn to the following questions: How are brands related to other intangible assets? Should investments in brands be capitalized in national accounts? What more do we need to know to improve the measurement and analysis of brands? And how are brands related to innovation and productivity?

1.1 Intangible assets—the knowledge capital of the firm

Let us begin with intangible capital—a model of which is summarized in Box 1—to see how brand equity fits into this broader picture. Following Corrado, Hulten, and Sichel (2005, 2009, hereafter CHS), a firm's total intangible assets consist of its computerized information, its intellectual and creative property (e.g. R&D), and its economic competencies.

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[3] Farquhar (1989).

[4] The latter terms are interchangeable will not be continue to be spelled out. It should be noted that while brands, marks, and logos have been around for a very long time (see Box 3), brand *equity* is a concept born essentially in the 1980s. And while definitions and concepts have evolved, the notion that brand equity represents an asset and that building brand equity is a strategy for differentiating a product/service from its competitor was generally established by the early 1990s (Chieng and Goi 2011).

Box 1. Innovation and Knowledge Capital—A Formal Approach

Consider a model as set out in Corrado, Goodridge, and Haskel (2011) with just two industries/sectors (a) an "innovation sector" or upstream sector that produces knowledge and (b) a "production sector" or downstream sector that uses the knowledge to produce "production" or "final output".

Assume further that the upstream sector uses "basic" ideas for free, e.g. from universities, and uses them to produce "finished" ideas or commercial knowledge, e.g., blueprints that can be licensed to the downstream producers. Let this newly produced commercialised knowledge have the value $P^N N$ and the per-period licensing fee users must pay to use knowledge be $P^R R$ (so for example, buying a unit of this knowledge outright costs P^N, whereas renting a unit of the stock costs P^R per year). This implicitly assumes that the upstream sector can, at least for some period, appropriate returns to its knowledge, and so this model is identical to Romer (1990) (where patent-protected knowledge is sold at a monopoly price to the final output sector during the period of appropriability).

The downstream sector does not produce knowledge or information, but rather consumption and investment goods whose value is given by $P^Y Y_t = P^C C_t + P^I I_t$. The downstream sector must pay, however, for the knowledge and information produced by the upstream sector to accomplish this production. The downstream sector is assumed a price-taker for knowledge; by contrast the upstream sector has *market power* (via patents or business secrecy).

With these assumptions in hand, we are in a position to write down the production functions and factor payment equations for the two sectors as follows:

$$N_t = F^N(L_t^N, K_t^N, R_t^N, t^N); \quad P_t^N N_t = \mu(P_t^L L_t^N + P_t^K K_t^N)$$
$$Y_t = F^Y(L_t^Y, K_t^Y, R_t^Y, t^Y); \quad P_t^Y Y_t = P_t^L L^Y{}_t + P_t^K K_t^Y + P_t^R R_t^Y \qquad \text{(1a and 1b)}$$

On the left of these equations are the production functions describing how inputs are transformed into outputs. The production functions have three factors of production, stocks of labor *L*, stocks of tangible capital *K*, and stocks of knowledge *R* superscripted by *N* or *Y* depending on sector of usage. The term *t* captures anything that shifts the production function but is costless e.g. free knowledge or inspiration. On the right of these expressions are the factor payment equations that describe the payments to the factors of production. In the factor payment equations, factor prices P^L and P^K are competitive for services supplied, per unit of labor and capital input, respectively

In the upstream factor payments equation, there are no payments for basic knowledge R^N, because its services are assumed free and quantities are determined outside the model. The parameter $\mu \geq 1$ measures upstream *market power*, the "innovator" markup over competitive factor costs of inputs used up in the innovation process. The downstream payments equation shows the downstream sector pays to use the knowledge stock.

The stock of commercial knowledge R^Y is the accumulated output of upstream production *N*, which grows via the perpetual inventory relation:

$$R_t^Y = N_t + (1-\delta^R)R_{t-1}^Y \qquad \text{(2a)}$$

where the term δ^R is the rate of decay of appropriable revenues from the existing stock of commercial knowledge. An analogous equation determines the stock of physical capital.

$$K_t^Y = I_t + (1-\delta^K)K_{t-1}^Y \qquad \text{(3b)}$$

Pakes and Schankerman (1984) discussed the depreciation of knowledge δ^R for the case of private R&D. As they point out, the deprecation of physical capital δ^K is well established and is commonly thought of as *physical decay*: that is, a decline in the ability to render capital services due to wear and tear. It is then sometimes asked how such a concept can be applied to *intangible* capital, given that it is unlikely to wear out. However, this is not the right interpretation of the term. What is required is a measure of how the value of intangible capital declines because (a) new ideas are invented that make old ones obsolete (or ideas "leave" the firm if they are embodied in departing workers) and (b) firms cease to appropriate benefits as it is copied by competitors (e.g., via patent expiry). These considerations suggest the appropriability of knowledge decays very fast, the polar opposite of the "wear and tear" idea that it does not decay at all.

Source. Adapted from Corrado, Haskel, Jona-Lasinio, and Iommi (2013).

Brand equity is a component of economic competencies. Thus not all of a firm's intangible assets are attributable to brand equity, an obvious point for R&D intensive firms but also true for firms whose intangible assets consist of brands, designs, and managerial practices associated with a common name.

To drive this point home: Consider Liz Claiborne Inc., the company named Fifth & Pacific Inc. as of 2012. Liz Claiborne's contributions as a designer are legendary but Claiborne also was the first designer to insist that her collection be placed together on the department store floor, instead of in separate clothing categories. This revolutionized the way department stores arranged clothing for sale, changed the way consumers shop, and created fashion merchandising as we know it today. When Claiborne retired in 1989 from active management of the namesake firm she helped found, the value of Liz Claiborne Inc. was influenced by (1) the Liz Claiborne name, (2) the ability of Claiborne as a designer, and (3) the success of her company's business methods. All are intangible assets; only the first is brand equity. So, the value of the company declined when Liz retired because it lost the present discounted value of her expected future contributions as a designer and strategic manager; the earning power of the brand name remained. Indeed, the Liz Claiborne family of brands lives on to this day, having been sold to J.C. Penney in 2011 (albeit at a bargain price).

Table 1 lists the commonly analyzed intangible asset types. The categorization is due to CHS, who devised a scheme for measuring investment in each intangible asset type shown in the table. In the CHS approach, investments in all strategic functions—including marketing—are included in the asset category, organizational structure, or organizational capital. The practice is due, at least in part, to the fact that very detailed data are required for estimation of subcomponents of organizational capital. Not only were such data not available at the time of the original CHS work, CHS focused on the macroeconomic growth implications of intangible capital, as has most related work in the area to date.

In this report, we focus entirely on brands, and thus we include all promotion and marketing activities in the brand equity asset type within total intangible capital. This does not change the basic CHS approach based on the broad asset types shown in table 1, nor does it change the model of intangible capital and its macroeconomic links to the analysis of innovation set out in Box 1.

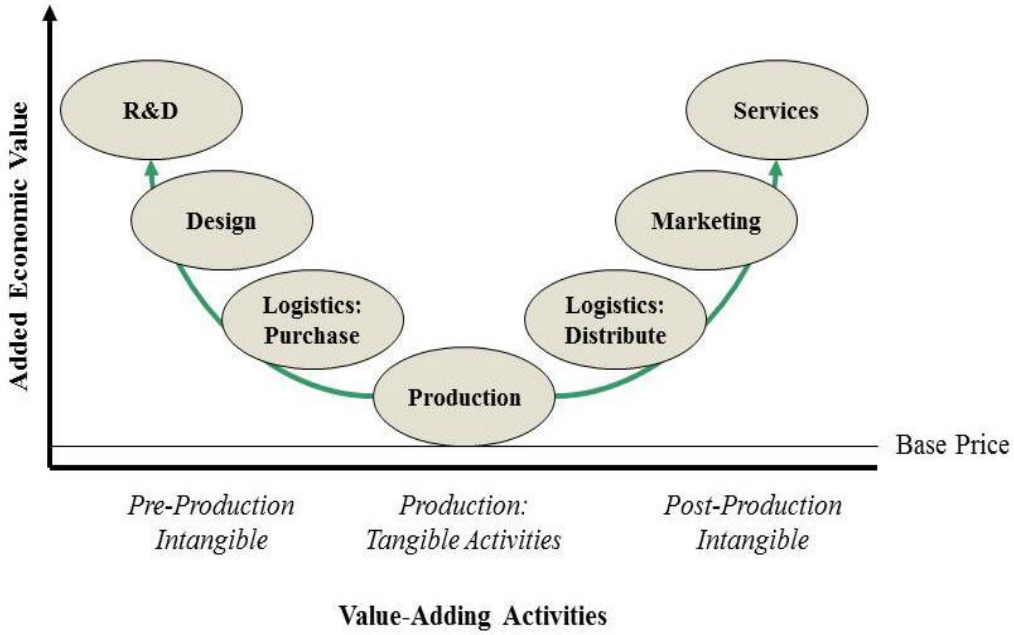
But we must depart from the existing intangible literature for the analysis of brands because the marketing and public relations functions *within* a firm are not only highly strategic and central to a firm's capacity for generating revenues, like advertising and other promotion costs, marketing/PR is directed at securing value through developing and nurturing an association with customers. Also new with this report, then, is the development of an explicit "own-account" component of strategic marketing investments in brand.

Table 1. Knowledge Capital of the Firm—Intangibles by asset type	
Asset type	**Included in National Accounts?**
Computerized information	
1. Software	Yes
2. Databases	?[1]
Innovative property	
3. Mineral exploration	Yes
4. R&D (scientific)	Australia, Canada, and US-yes[3], satellite for some others[2]
5. Entertainment and artistic originals	EU-yes, Japan-no, US-yes[3]
6. New product/systems in financial services	No
7. Design and other new product/systems	No
Economic competencies	
8. Brand equity	
a. Advertising	No
b. Market research	No
9. Firm-specific resources	
a. Employer-provided training	No
b. Organizational structure	No

1. SNA 1993 recommended capitalizing computerized databases. The position of most national statistical offices is that databases are captured in their software estimates.
2. R&D satellite accounts are available, or under preparation many countries. Results for Finland, Netherlands, and the United Kingdom are publically available.
3. The United States included entertainment and artistic originals and R&D as investment in headline GDP in a comprehensive revision released July 31, 2013.
Source: Authors' update and adaptation of table Corrado et al. 2013,

Lest the equations in box 1 or national accounting terms of art such as "own-account" seem abstruse, to help fix ideas figure 9 depicts how intangibles fit into a global value chain (GVC). Case studies of sourcing for the production of Apple's iPhone and Boeing's Dreamliner have made the international nature of production networks called GVCs well known, but this is not the reason for introducing figure 9. The figure is introduced because it puts the spotlight on *business functions*.

Figure 9. Intangibles in a Global Value Chain



Source—"Knowledge-based Capital, Growth and Competitiveness" by Dirk Pilat. Available at http://simpatic.eu/wp-content/uploads/2013/03/2013-03-26_Dirk-Pilat.pdf

Some business functions represent production and distribution (the middle three) whereas many others are associated with innovation and product differentiation (R&D, design, marketing, services). Business functions may correspond to departments within a single firm at a single location, or they may represent transactions among different firms or departments in a GVC.

Each business function is a value-adding activity, with intangible activities falling "pre-" and "post-" production as noted along the horizontal axis of the figure. The relative value added of each activity is reflected in the height of the green connecting line relative to the "base price" (the production cost shown as the thin black line). The green line is drawn with a sharp curvature to suggest that substantial value added accrues to non-production functions; a flatter line, higher in the middle, would suggest that relatively more business value added occurs in production.

The sharp curvature also suggests that pre- and post-production intangibles go hand-in-hand, e.g., that firms that innovate along the R&D margins are also likely to be innovative and/or effective in marketing. In fact, a mild association between R&D spending and marketing innovation surfaces in recent survey data for Europe (upper panel of figure 2, previously introduced), and between R&D and promotion expenses by industry in the United States (lower panel of figure 2, previously introduced).[5] And, while research on the important topic of interactions among intangible assets is sparse, an in-depth study of the consumer products sector revealed that branded producers introduce more new products and undertake more R&D (as a percent of sales) than unbranded producers (Clayton and Turner 2000).

Investments matched by performance excellence contributes to a company's brand: e.g., a company's brand is influenced by low costs and strong quality (product innovation) built through investments in R&D, by service capabilities designed by investments in market research, and by innovative business methods arising from managerial know-how (recall our discussion of Liz Claiborne, Inc.). A strong corporate brand can thus be built—over the long haul—through maintained alignment of performance with customer expectations (Gregory 2003). The benefits of a strong brand are many, including perhaps above all the conduct of a business strategy based on product/service differentiation.[6]

A strong brand can also be built in *the short-run* through investments in carefully designed marketing (or promotion) activities. This is what is usually measured as investments in brands in the intangible capital literature (and often advertising alone is used as a proxy for this). This then implies that estimates of the value brand equity grounded in standard growth accounting methods will in all likelihood miss the component of brand equity that stems from the sustained dynamic interaction of a company's name with its performance (esp., the quality of its products and service).

In fact, the intangible capital literature estimates that brand equity (measured as the value of capital resulting from a company's investments in marketing research and product branding) is rather small, averaging nearly 8 percent of the total value of intangible capital in 12 Euro Area countries (1995 to 2007), and about 7 percent in the United Kingdom and United States and less than 6 percent in Japan for the same period.[7] By contrast the share of private R&D assets are estimated to be 30 percent of total intangible assets in the Europe and the United States, despite the fact that the investment rates in the two assets are not all that different (15 vs. 20 percent of total intangible investment in the U.S. case).

[5] The bottom quartile of R&D performers is excluded in this graph because industries with very low R&D to sales ratios, e.g., retail trade, have business models for which R&D is not an indicator of innovation.
[6] The full range of benefits is discussed in Aaker (1991).
[7] Based on estimates from 1995 to 2007. For these and subsequent references to intangible assets data for Europe, Japan, and the United States the sources are as listed in the Acknowledgements.

The reason why the values for *stocks* of brand equity and private R&D differ so much is that the assumed (geometric) rate of depreciation for brand equity is a great deal faster than the rate assumed for private R&D (.55 vs. .15).[8] The very high depreciation rate for brand equity reflects the fact that advertising is the dominant component of measured investments in brands, and what little we know about the lifetime of benefits from advertising suggests it is relatively short-lived. Still, to many in business, these magnitudes are difficult indeed (after all, some brands have been around for 100 years), and we take a hard look at this issue in this report.

Having established our point of departure, then, we move to address the first of the economic questions posed in the introduction to this section, namely, whether brand equity really is productive capital. Interestingly, economists have been stuck on this question for many, many years—the debate goes back at least to Alfred Marshall who pondered in 1919 whether advertising increases or decreases consumer prices.

1.2 Brand equity: is it really productive capital?

What distinguishes a business investment from a current expense? An investment is an outlay made today to achieve benefits in the future. A current expense is an outlay whose benefits are immediate. One could then say the hallmark of an investment is "futurity," which in the case of R&D expenditures seems fairly obvious. In the case of promotional expenditure (spending for marketing, advertising, and corporate communication, i.e., the oval represented by "marketing" in figure 9), the conventional thinking is that, yes such expenditure may yield future benefits to a given firm, but not to society at large because what is one firm's gain is another's loss. In other words, to the extent that advertising stimulates the demand for a firm's product, substitution away from others will leave consumer demand for the product class unchanged.

This argument, the zero-sum argument we shall call it, is frequently invoked as a reason not to capitalize investments in brand equity in national accounts. The classic statement of the zero-sum argument was by Solow (1967, 1968) in a critique of Galbraith (1967), who had argued that advertising had strong effects on consumer preferences and demand. As summarized in Grabowski (1976, p 22), Solow argued that the main impact of advertising is on the market shares *within* a particular industry or between product classes that are close substitutes. Solow expressed serious doubts about whether branding could significantly influence either the distribution of demand across broad product classes (food vs. clothing vs. housing) or the level of aggregate consumption versus saving.

There are at least four rebuttal points against using the zero-sum argument as a reason for not capitalizing investments in brand equity in national accounts.

[8] This refers to the rates used to develop the INTAN-Invest dataset (see table 2, p. 35 of Corrado *et al.* 2012) available at www.INTAN-Invest.net .

First, the argument has no time dimension (and capital is about time): To say that brand equity depreciates at a geometric rate of 55 percent per year in fact implies that demand is stimulated by an ad campaign for just a few years before buyers forget or competitors imitate and offset it.[9] This simple fact tends to get lost by proponents of the zero-sum argument. Moreover, among those who are aware of the implications of the standard assumption, many argue the other way, namely, that a geometric depreciation rate of .55 is way too fast! The "too fast" argument is that, while the impact of advertising decays very fast at the beginning of its life, the overall lifetime of surviving information "bits" is much, much longer than a few years.[10]

Second, if brand equity is a determinant of the market capitalization of a given firm (on this everyone seems to agree), then via the life-cycle hypothesis of saving for branding to have no net impact on aggregate consumption and saving, the aggregate value of brand equity must be zero. That aggregate brand equity is zero is contradicted by data on aggregate corporate valuations, which tend to exceed available measures of tangible capital stocks at replacement cost (on average); indeed, a consistently wide margin has persisted since the early 1990s.[11] R&D cannot close (or explain) the margin—although the addition of other intangible assets helps a good deal (Hulten and Hao 2008)

Third, the zero-sum argument breaks down in the presence of market power and imperfect competition, two assumptions that feature prominently in innovation analysis (e.g., Romer 1990; and see Box 1). Intangible investment includes the ways that modern companies create competitive advantage and differentiate their products and services. The fruits of R&D or of imaginative marketing can create whole new industries, or new product lines within an industry—each of which, alone and in conjunction with patent protection and business secrecy, convey market power and a degree of protection for the innovator (at least for a time). Furthermore, it has been speculated that having a strong brand enables firms to be better placed when taking new innovations to market (*i.e.*, consumers' take up of new technologies is quicker). A strong brand also helps exploit economies of scale, which can lead to lower consumer prices.

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[9] To be precise, with a declining balance rate (d) of 1.67 (the usual assumption as per Hulten and Wykoff 1981), the service life (T) of real investment that depreciates at a geometric rate of .55 is just *three years* $(\delta = d/T)$.

[10] Note that if we give the underlying age-price profile of promotion costs more curvature by setting the declining balance rate to 2 and lengthen the service life to 6 years, we still get a relatively fast depreciation rate $(\delta = 2/6 = .33)$. Related to the "too fast" argument is one based on gestation lags, namely that content development and "run" time of the average ad campaign is not included, in which case there may be no reason to adjust curvature, but the service life would be longer (and geometric rate of depreciation slower).

[11] For recent calculations of "q"-type ratios for U.S. nonfinancial corporations, see Hodge *et al.* 2011.

In short, what we know about the interaction between market power, pricing and innovation does not square with the zero-sum argument (as per the dynamic interaction mentioned in the overview section and discussed more fully below). Acknowledging market power opens the possibility, however, that Galbraith may have been correct in his view of advertising, namely that it is primarily "persuasive" rather than "informative."[12]

This brings us to our fourth and final point: Neither the zero-sum argument nor the "persuasive" view of advertising is backed up by a dispositive body of empirical work. In fact, both seem to be contradicted by the most recent evidence, evidence that took advantage of a policy change in Austria in 2000 (Rauch 2011; see also his VOX blog and Tim Taylor's Conversable Economist Blog, both issued 11/13/2012).

Austria is the only country in the OECD that charges a tax on advertising, a tax that directly affects the cost of advertising. Each of Austria's 10 regions had its own tax rate until 2000, after which rates were harmonized across regions at 5 percent. Thus the advertising tax, and therefore the cost of advertising, increased in some parts of the country while simultaneously decreasing in others. Rauch viewed this as a natural experiment to reconsider the question posed by Marshall nearly a century ago, namely whether advertising increases or decreases consumer prices, or whether the "persuasive" or "informative" view of advertising holds (zero-sum holds that neither does).

Rauch found the aggregate effect of advertising to be informative and that, *on average*, advertising *decreases* consumer prices (full disclosure: some "persuasive" advertising was found, but it did not predominate). For further details and a review of earlier findings on the impact of advertising on selected goods and services, see his working paper.

1.3 Investments in Brand: What are they?

Having defined brand equity, connected brand equity to economic growth, and established, we believe, that investments in brands generally create information for consumers and a stream of revenue for the firm, we now consider the scope and definition of investments in brand in an economic sense. Branding involves many things that a company does: advertising and marketing and marketing research, product packaging and website content, public relations, investor relations, and employee relations. We summarize these activities in the term, promotion costs, and thus investments in brand are defined as *promotion costs*.

What are promotion costs, then, and how do they differ from routine production costs? Promotion costs are the "post-production" intangibles in figure 9. They are outlays designed to augment the demand for a firm's products and services—that is, to shift its price-quantity demand schedules

[12] Although there are many explanations of how advertising helps a firm enhance its market power, three main views have emerged: persuasive, complementary, and informative (for further discussion, see the review by Bagwell 2005).

upward, so that more will be sold at a given price. Routine costs are the outlays required to meet this demand. Note that this dividing line means that some costs conventionally classified as marketing costs, for example, physical distribution and sales, rather are routine costs. So, in terms of figure 9, broadly defined, the middle three business functions represent routine costs.

Promotion costs consist of expenditures for strategic marketing (including marketing research), long-lived product advertising, corporate public relations (PR) and corporate communications. Marketing research is in this category in part because it is not included in R&D.[13] But a study of line-of-business practices that examined interactions between firms' R&D and market research functions found that, while the precise nature of their relationship depends on firm strategy, the two functions are usually distinct within business organizations (Reukert and Walker 1987). Moreover, market research is often thought of as supporting marketing and PR, even though it also connects to other intangible investments and firm capabilities (product R&D, service, and product/market know-how) and thus impacts *both* brand equity and innovative capacity. But the natural link is to strategic marketing, especially with the growing importance of "big data" and data analytics in strategic marketing, which suggests continuing the practice of including market research in investments in brands.

Strategic marketing also encompasses what has come to be called "content" marketing, a type of branding that is notable in its heavy use of in-house talent and social media.[14] In a recent survey of marketers, fully 80 percent reported they disseminated content via social media.[15] Although content marketing makes heavy use of social media, the survey found that content is also disseminated via print, blogs, video, live events, targeted microsites, branded entertainment, white papers, webinars, and custom social communities (in that order). In other words, a mixture of owned channels and paid channels is common. Owing to the reported growth of content marketing, we might expect an own-account component of brand investment to grow faster than, say, GDP or traditional business investment in recent years.

Advertising is the most indisputable form of promotion cost although its durability—the life length of its expected benefits—has been a subject of debate (related in part to the zero-sum argument discussed earlier). The emerging survey evidence on intangible assets in the United Kingdom (Awano *et al.* 2011) is thus extremely noteworthy in this regard. The UK Intangible Asset Survey asks businesses for their spending on various intangible assets; then it asks about the

[13] The OECD's *Frascati Manual*, which sets guidelines for R&D surveys, specifically instructs market research to be excluded from R&D (OECD, 2002, p. 33).

[14] Content marketing is focused not on selling, but on communicating with potential customers. The idea is to inspire business and loyalty from buyers by delivering consistent, ongoing valuable information. The Michelin Guide first issued to French motorists (*Guide Michelin*) in 1930 is an early example of informative guides and content marketing.

[15] Survey conducted by and reported in *Advertising Age* "Solving the Content Creation Conundrum" January 13, 2013.

expected life length of the asset's benefits. The survey's results support the capitalization of non-R&D intangible assets, while also confirming the relatively short service lives set for these assets by CHS (Corrado *et al.* 2013).

For reputation and branding, the UK survey reports an expected lifetime shy of 3 years (2.8, to be exact). But the survey's question is worded in a way that suggests content development and implementation (gestation) time is not included. It is also unclear how the survey's responses are related to the average length ("run" time) of a given ad or campaign. It stands to reason that gestation periods may be very short for some advertisements, but rather substantial for marketing and major ad campaigns. We have no hard information on content development and implementation time, but the average length (run time) of national campaigns reportedly is 17 months, and content development and implementation time could be equally long.[16] In the technology sector, where product life cycles are short, national product campaigns likely run for much shorter periods, but then there are campaigns (such as those for Absolut vodka to name just one) that seem to go on forever.

In section 3 of this report we delve more deeply into these and other issues that arise in the measurement of investment in brands.

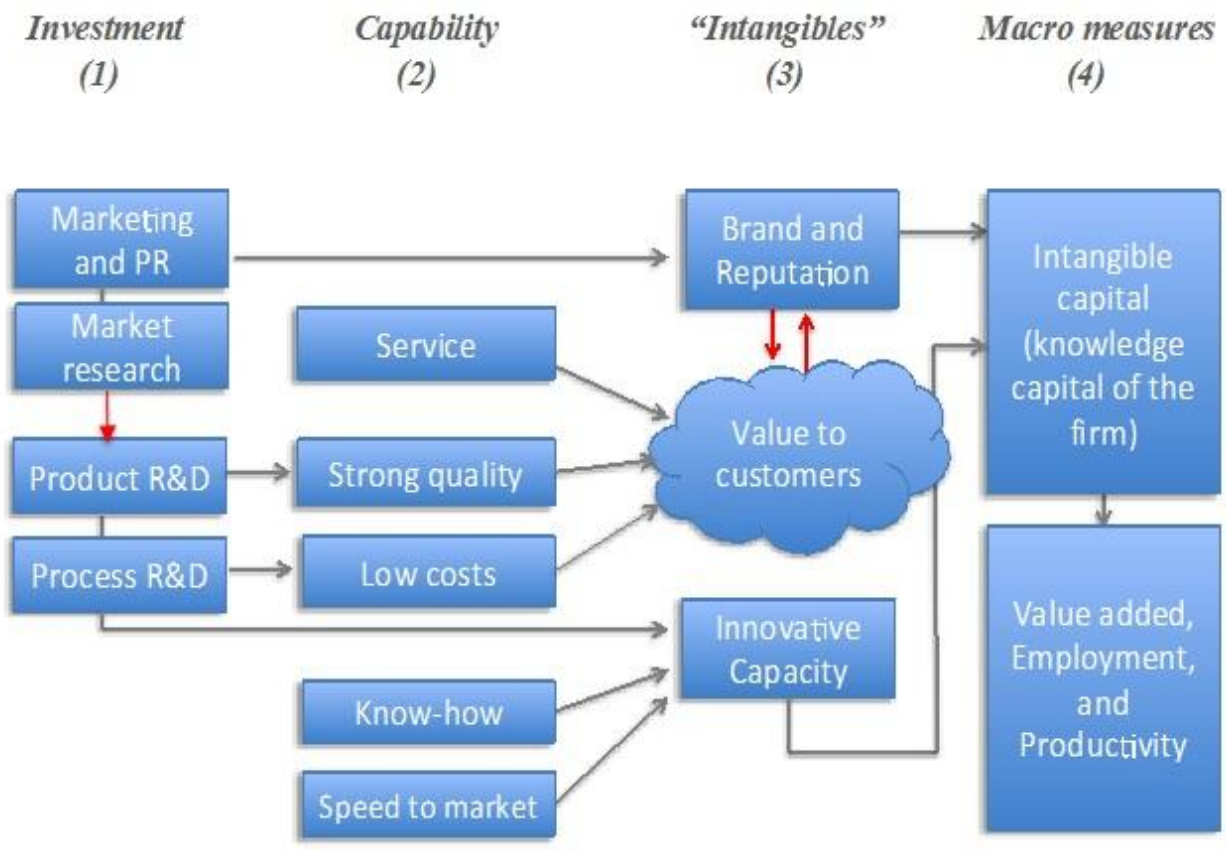
Section 2. Brands and economic growth

The dynamic interaction between firm performance and customer valuation of brands (which feeds back to performance, etc.) introduces demand-side elements in how we think about how intangible investment impacts economic growth. Put differently, marketing (like product R&D) is not directed at increasing the efficiency of production but rather to augmenting the revenue of the firm for a given production cost. This implies that factor shares used to assess the contribution of inputs are related to the price elasticity of demand and imply a dynamic interaction between demand and supply in economic growth (see Corrado and Hulten 2012 for further discussion).

A schematic of this dynamic interaction is shown in figure 10. To keep things simple, the figure highlights relationships most relevant to the point at hand. For example, the figure depicts just intangible capital as impacting macroeconomic outcomes on the far right (panel 4). And with regard to specific intangibles, the figure distinguishes between just innovative capacity on the one hand and brand and reputation on the other (panel 3). Business investment (panel 1) thus consists of promotion expenses (the rectangles labeled marketing and PR and market research) and R&D spending (labeled product and process, respectively).

[16] The "run" time figure is from Dr. Barbara J. Lewis course notes (Topic 14) at http://academic.brooklyn.cuny.edu/economic/friedman/coursepa.htm#ADVERTISING (Accessed January 25, 2013).

Figure 10. From Business Investment to Economic Growth



Source. Authors' adaptation of a figure from Clayton and Turner (2000).

Figure 10 shows a direct line from R&D to innovative capacity to macro measures, and likewise a direct line from marketing/PR investments to brand and reputation equity to macro measures. This is the normal way of thinking about investment and capital and growth, e.g., R&D investment yields new and better products for the firm to sell—a return to innovative capacity. Investment in communications enhances brand image and company reputation that in turn influences sales—a return to the stock of information communicated.

But business reality—and figure 10—suggests these elements combine to form a more dynamic model of competitive growth than just described. The figure highlights (in red) how brand and reputational equity is determined by the value customers place on firms' customer-facing capabilities: service, product innovation and thus relative quality, and competitive costs (the first three rectangles in panel 2). Such firm-level dynamics are consistent with the previously mentioned empirical associations between marketing and innovation. The two-way street between value to customers and brand equity (which then connects back to all customer-facing aspects of firm performance, including R&D) reflects the aforementioned presence of a demand-side element

in economic growth. The potential for market research to influence product R&D also plays a role in this process.

2.1 Productivity trends in advanced countries

To examine trends in the empirical relationship between brands and growth and productivity we need to shift gears to "normal" and consider how intangible capital contributes to macroeconomic labor productivity growth using the standard growth accounting framework (the "normal" part of figure 10).

The contribution of changes in a type of capital to output growth is given by an elasticity obtained from differentiating the production function (e.g., equation 1b in Box 1) with regard to capital. If the production function exhibits constant returns, the first-order conditions under cost minimization imply that capital's elasticity is equal to its share in total costs (if perfect competition is assumed) or its share in total revenue if product markups are involved. A factor's contribution to output growth is then its revenue share times its rate of growth. After accounting for the contributions from all inputs to the rate of output growth, the remainder is the Solow residual, or multifactor productivity change.[17]

For 14 EU countries, Japan, and the United States, Corrado *et al.* (2013) report a decomposition of contributions to market sector labor productivity growth using the approach described in the previous paragraph from 1995 to 2007, reproduced here as table 2 (tables for this section are at the end of the section, i.e., starting on page 29). As may be seen in column (2b), lines 17 through 20, the contribution of intangible capital to labor productivity growth is substantial, accounting for more than 28 percent of growth in output per hour in the United States, and nearly 25 percent in EU countries. The contribution of intangibles to productivity growth in Japan (11 percent) is much smaller.

Table 3 decomposes the contribution of intangible capital into contributions of specific asset types. As may be seen, the relative size of individual asset contributions varies widely across the assets and geographies shown.[18] The contribution of brand equity is rather small, but as noted

[17] The growth accounting framework with intangibles and constant returns is consistent with markups over production costs (routine costs in our language) where the size of the markup is directly related to the factor share of intangible capital (Corrado, Goodridge, and Haskel 2011), which is in turn related to the price elasticity of demand as mentioned previously. Standard growth accounting still assumes lack of complementarities among factor inputs, and the "dynamic" part of figure 10 may manifest itself as complementarities between brand equity and other components of intangible capital. We are unaware of robust or widespread evidence for such links, however.

[18] One must of course underscore that results in these tables are for market sector investment only; results for R&D, for example, would be different if contributions from the public sector were also included. It should also be noted that results for R&D are on performer basis, as per discussion in section 3 of Corrado *et al.* (2012)

earlier, some part of organizational capital is in reality a contribution from investments in branding/marketing. And many believe the rate at which investments in brand equity are assumed to depreciate is too fast.

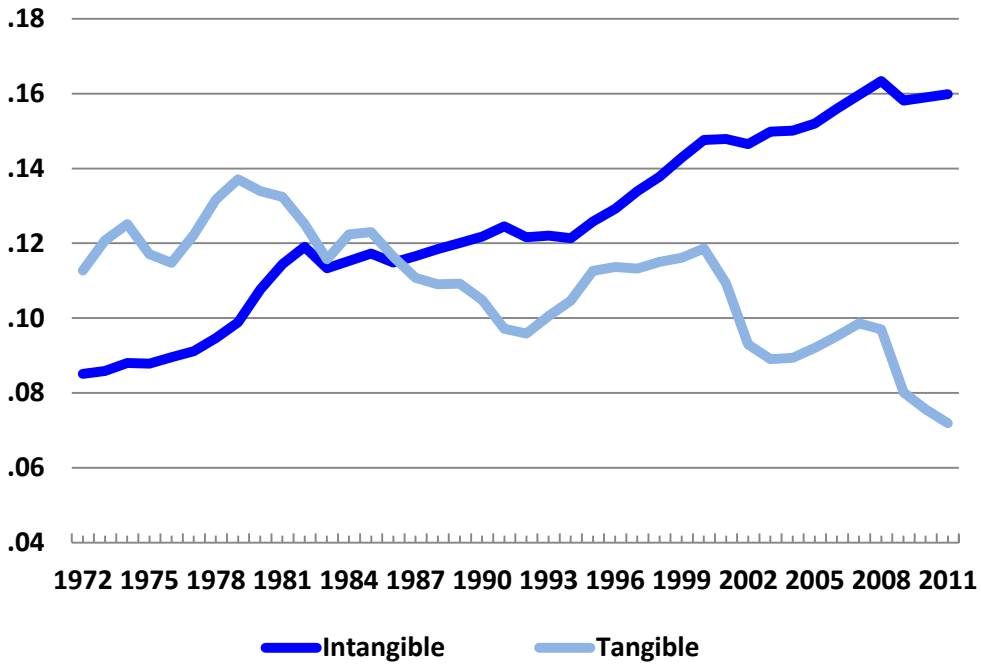
The results in tables 2 and 3, though rich in the comparative dimension, are limited in that they focus on a single time period and do not include recent years. A recent update to INTAN-Invest with intangible investment estimates through 2010 is available, however, and it shows that in twelve of the EU15 countries (weighted average basis, with Greece, Luxembourg, and Portugal excluded), intangible investment in 2010 was still 2.0 percent off its 2008 peak, following a 6.5 percent drop in 2009. In the United States the pattern is very similar: intangible investment in 2010 was 1.7 percent lower than it was in 2008, having fallen off 8.5 percent in 2009. For the United States, however, a longer history of intangible investment and growth accounting results are available, including preliminary figures through 2011.

U.S. investment is plotted in figure 11, where investments in intangible capital are revealed to have held up relative to investments in tangible capital during the Great Recession and its aftermath. The implications of the investment pattern shown in figure 11 for the sources of growth in U.S. output per hour are shown in table 4; results to two decimal points are shown to reveal the contribution of the brand equity component (not to signal precision!). As may be seen, the contribution of brand equity is essentially stable for the 30+ years shown.

As presaged by Figure 11, the *within* capital deepening comparative result, namely, that intangible capital deepening exceeds tangible capital deepening (row 4 versus row 3 of table 4) continues to hold true in the extended period (column 5). And looking at the relative contributions of major components to the growth of labor productivity (the memo items), we see the result originally pointed out by CHS, namely, that once intangible capital is accounted for, capital deepening (not MFP) becomes the dominant factor explaining economic growth.

Comparable results using U.S. GDP and investment data as currently published are shown in table 5 to illustrate the difference between them and results shown in table 4. The memos in column (5) underscore that recovery from the Great Recession was incomplete as of 2011 (i.e., neither output nor hours recovered as of 2011). Perhaps this need not be said, but the incomplete nature of the recovery means that results shown in column (5) are not new trends.

Figure 11. Intangible and Tangible Investment, 1972 to 2011 (ratio to output adjusted to include new intangibles)



Note--Estimates are for private industries excluding real estate, health, and education. R&D is on a performer basis.
Source--Unpublished update to Corrado and Hulten (2010).

2.2 Brand equity contribution

The stability and size of the contribution of brand equity component of intangible capital for the United States shown in table 4 reflects the stability and size of its underlying investment rate. This is because the *growth* of capital is determined by the *level*, or rate, of investment net of depreciation (as per the perpetual inventory relation in box 1). Now, the most striking feature of figure 11 is the strong upward trend in the rate of intangible investment. How does brand equity fit into this picture?

To answer this question, we make three separate points. The first is that as previously mentioned, this report devises new methods for measuring investment in brand equity (relative to CHS or INTAN-Invest). The new methods are described in the next major section and appendix of this report, where they are implemented for the United States. We can therefore update the SOG analysis using the new series for brand investment and capital. Table 6 reports percentage point differences between sources-of-growth analyses using the new vs. the old series.

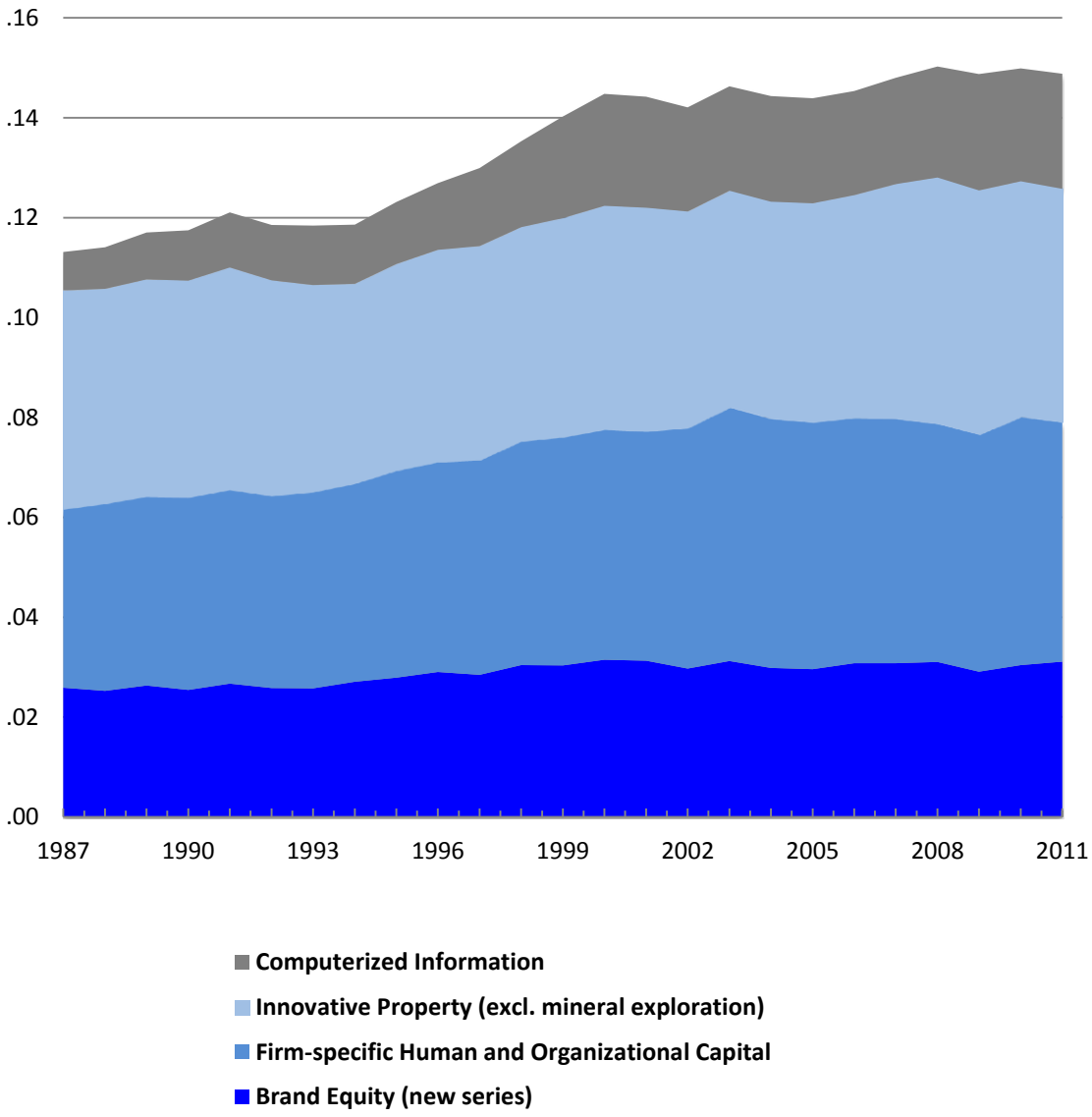
As may be seen, the contribution of brand equity is now 72 percent larger than previously shown. This is both because the new investment rate is stronger (by 74 percent from 1995 on) and the assumed service life of investments in brand 1/3 longer. With net investment growing faster for these reasons, not only is the SOG contribution of brands stronger, the estimated *value* of the stock of brand equity is considerably larger than previously estimated (essentially it doubles). All told, the value of brand equity averages 3.0 percent of private business fixed capital including intangibles (1995 to 2011) based on the new series for brand investment and capital.[19]

A second point is that the upward trend in the rate of U.S. intangible investment in figure 11 owes to spurts of growth in different components at different points in time. From about 2001 on, the increase owes primarily to an increase in mineral exploration, reflecting the much-discussed strong U.S. response to breakthroughs in "fracking" technology. Looking at the new brand investment series along with the major components of U.S. intangible investment excluding mineral exploration from 1987 to 2011 (figure 12), investments in brand equity are revealed both as substantial—22 percent of this total—and not materially less dynamic after 2001 than other components shown.

Third, both marketing-related services industries and the promotion, marketing, and market research activities within firms continue to undergo structural change, and we may still not be measuring the trend or the impact of investments in brand very well. Business advertising costs remain a major influence on the final series for investment in brands, and on this score the "facts" as we know them are as follows: (1) advertising spending is trending down in the United States but the same cannot be said for elsewhere across the globe, as we report in final section of this report, and (2) advertising spending is trending down in the United States but the lower outlays are not completely offset by increased costs within firms according to our new estimates. That said, we measure the latter indirectly, on the basis of employment and compensation by occupation, and it is possible we are missing something that is going on. Details are in the next section of this report, to which we now turn.

[19] This refers to fixed capital held by private industries excluding the education, health and real estate industries. The 3.0 percent estimate may seem small in light of financial market-based estimates that corporate brands are 5-7 percent of U.S. market capitalization (Gregory 2003). But the 3.0 percent estimate is relative to corporate *and* noncorporate business fixed capital. When one considers that corporations account for most of brand investment, that the brand intensity of corporate business likely is then much higher than that of noncorporate business, and that the value (at replacement cost) of corporate fixed capital is about 2/3 of total private business fixed capital in the U.S. national accounts, the two estimates are seen as rather close.

Figure 12. U.S. Intangible Investment, excluding mineral exploration, 1987 to 2011 (ratio to output adjusted to include new intangibles)



Note--Estimates are for private industries, excluding real estate, health, and education. R&D is on a performer basis.

Table 2. Comparative Productivity Results—Contributions to the growth of output per hour in the market sector of fourteen EU countries, Japan, and the United States, 1995 to 2007

	Labor productivity growth	Contribution of components:				
		Total Capital Deepening	Tangibles	Intangibles	Labor Composition	Multifactor productivity
	(1)	(2)	(2a)	(2b)	(3)	(4)
1. Austria	2.4	0.8	.3	.5	.2	1.4
2. Belgium	1.8	0.7	.2	.5	.1	1.0
3. Czech Rep	4.2	2.4	1.9	.5	.3	1.5
4. Denmark	1.4	1.2	.7	.5	.2	-.1
5. Finland	3.8	.9	.2	.7	.2	2.7
6. France	1.9	1.0	.4	.6	.4	.5
7. Germany	1.7	1.0	.7	.3	.0	.8
8. Ireland	3.8	1.4	.8	.6	.1	2.2
9. Italy	.6	.7	.5	.2	.2	-.4
10. Netherlands	2.3	.9	.4	.5	.4	1.0
11. Slovenia	5.3	1.7	1.2	.5	.7	2.9
12. Spain	.8	1.0	.7	.3	.5	-.6
13. Sweden	3.7	1.9	1.1	.8	.3	1.5
14. United Kingdom	2.9	1.5	.8	.7	.4	1.1
15. Japan	2.1	.9	.7	.2	.8	.5
16. United States	2.8	1.5	.7	.8	.2	1.1
Memos:		Average percent contribution of component:				
17. EU (GDP-weighted avg.)		65.4	41.6	23.8	14.8	19.0
18. EU (simple avg.)		57.3	34.3	23.0	15.5	26.3
19. Japan		42.0	31.2	10.7	35.7	22.3
20. United States		53.9	25.5	28.4	7.3	39.0

Source: Corrado, Haskel, Jona-Lasinio, and Iommi (2013) based on data for EU countries and the United States as developed and documented by the same authors (see www. INTAN-Invest.net). For Japan, the sources are Fukao, Hisa, and Miyagawa (2012) and Miyagawa and Hisa (2013).
Note—For individual countries, figures in column (1) are annual percent changes, and figures in columns (2) through (4) are percentage points. In the memos panel, columns (2) through (4) are the fraction of column (1) accounted for by the respective column; results are independently rounded.

Table 3. Comparative productivity results—Contribution of components of intangible capital to the growth of market sector labor productivity, 1995 to 2007 (percentage points)

	EU average[1]	Japan	United States
	(1)	(2)	(3)
1. Intangible capital, total	.52	.24	.79
2. Computerized information	.14	.12	.22
3. Innovative property	.17	.10	.25
3a. R&D	.09	.04	.14
3b. Entertainment, artistic, and literary originals	.01	.03	.02
3c. Design/other[2]	.07	.03	.09
4. Economic competencies	.21	.02	.31
4a. Brand equity	.07	.04	.04
4b. Firm-specific human capital	.02	-.02	.03
4c. Organizational capital	.11	.00	.24

Sources: Rows 2 though 4 in columns 1 and 2 kindly provided by Massimiliano Iommi and Tsutomu Miyagawa, respectively.

1. Simple average of results for 14 countries (see table 1 for the list of countries).

3. Other is mineral exploration and investments in new financial products not included in R&D.

Table 4. Sources of Growth in U.S. Private Industry Output per Hour, Including Intangibles, 1980 to 2011					
	1980-2011 (1)	1980-1990 (2)	1990-2001 (3)	2001-2007 (4)	2007-2011 (5)
1. Output per hour	2.25	2.20	2.58	2.24	1.44
Contribution of:					
2. Capital deepening	1.18	.96	1.38	1.13	1.25
3. Tangible[1]	.53	.40	.70	.45	.49
4. Intangible	.66	.56	.69	.68	.77
a. Computerized information	.17	.12	.23	.15	.16
b. Innovative property	.25	.26	.19	.25	.42
c. Economic competencies	.23	.18	.26	.27	.19
(i) Brand equity	.03	.03	.03	.03	.03
(ii) Firm-specific human capital	.03	.02	.02	.04	.04
(iii) Organizational capital	.17	.14	.20	.20	.11
5. Labor composition	.29	.31	.32	.19	.34
6. MFP	.77	.94	.88	.92	-.15
Memos—Percent of Line 1 explained by:					
7. Intangible capital deepening	27.0[2]	25.5	26.6	30.3	---
8. Total capital deepening	49.5[2]	43.6	53.6	50.7	---
9. MFP	38.5[2]	42.5	34.1	41.0	---
10. Total capital deepening *without* new intangibles[3]	36.7[2]	30.8	41.8	35.1	---
11. MFP *without* new intangibles[3]	49.8[2]	53.3	44.6	55.3	---

Note—Private industry excludes education, health, and real estate. Annual percent change for periods shown calculated from log differences. Column 2, 3, and 4 periods are between years with business cycle peaks as defined by the NBER. Rows 1 is annual average percent change, and rows 2 through 6 are independently rounded percentage point contributions.

Source—Authors elaboration of output, hours, and fixed asset data from BEA; labor composition index is from BLS. Estimates of intangibles not capitalized in the U.S. national accounts as of May 2013 are based on data from BEA (R&D and entertainment and artistic originals) and INTAN-Invest.

1. Excludes land (but includes inventories).
2. Calculated from 1980 to 2007.
3. Based on results shown in table 5.

Table 5. Sources of Growth in U.S. Private Industry Output per Hour, Current Asset Boundary, 1980 to 2011

	1980-2011 (1)	1980-1990 (2)	1990-2001 (3)	2001-2007 (4)	2007-2011 (5)
1. Output per hour	2.22	2.13	2.60	2.20	1.45
Contribution of:					
2. Capital deepening	.88	.66	1.09	.77	1.01
2a. ICT	.55	.46	.76	.44	.37
2b. Non-ICT[1]	.33	.20	.33	.33	.64
3. Labor composition	.33	.34	.35	.21	.39
4. MFP	1.02	1.14	1.16	1.22	.06
Memos:					
5. Output	2.92	3.53	3.82	2.56	-.51
6. Hours	.70	1.40	1.22	.36	-1.96

Note—Excludes private education, health, and real estate. Annual percent change for periods shown calculated from log differences. Column 2, 3, and 4 periods are between years with business cycle peaks as defined by the NBER. Rows 1, 5, and 6 are annual average percent change for period indicated. Rows 2 through 6 are percentage point contributions and are independently rounded.
Source—Authors' elaboration of output, hours, and fixed asset data from BEA; the labor composition index is from BLS.
1. Excludes land.

Table 6. Sources of Growth in U.S. Private Industry Output per Hour, including New Series for Investment in Brands, 1980 to 2011
(percentage point difference from results reported in table 4)

	1980-2011 (1)	1980-1990 (2)	1990-2001 (3)	2001-2007 (4)	2007-2011 (5)
1. Output per hour	.01	.01	.01	.00	.01
Contribution of:					
2. Capital deepening	.00	.00	.01	.00	.02
3. Tangible[1]	-.01	-.01	-.01	-.01	.00
4. Intangible	.01	.01	.01	.01	.03
a. Computerized information	.00	.00	.00	.00	.00
b. Innovative property	.00	.00	.00	.00	-.01
c. Economic competencies	.01	.01	.01	.01	.03
(i) Brand equity	.02	.01	.03	.02	.05
(ii) Firm-specific human capital	.00	.00	.00	.00	.00
(iii) Organizational capital	-.01	.00	-.01	-.01	-.01
5. Labor composition	.00	.00	-.01	-.01	.00
6. MFP	.01	.01	.02	.00	-.03

Note—Excludes private education, health, and real estate. Annual percent change for periods shown calculated from log differences. Column 2, 3, and 4 periods are between years with business cycle peaks as defined by the NBER. Rows 1 is annual average percent change for period indicated. Rows 2 through 6 are percentage point contributions and are independently rounded.
Source—Authors elaboration of output, hours, and fixed asset data from BEA; the labor composition index is from BLS. Estimates of intangibles not currently capitalized in the U.S. national accounts are based on data from BEA (R&D and entertainment and artistic originals) and Corrado et al. (2012).
1. Excludes land.

Section 3. Measurement

Communication, marketing, and advertising expenditure is surprisingly hard to pin down as there are multiple sources of data and the conceptual basis for some is not clear. We first review the existing approach to the measurement of such spending. Second, we review the new spending and investment results for the United States. Finally, we review our general determination of (1) how much of brand spending is long-lived investment and (2) the service life for direct investments in brand. Details are in an appendix.

3.1 Existing approaches and need for a fresh perspective

The general approach taken for estimating nominal intangible investment expenditures is summarized in Box 2.

Spending on corporate communications, marketing and advertising is a common indicator for investment in brand development, a practice that generally follows both the early intangible capital literature and CHS. CHS used total advertising spending and revenues of the market research industry as *indicators* for direct investment in brand development. Specifically, only a portion of total advertising spending was considered investment. (In the parlance of Box 2, the capitalization factor γ was less than one, about .6). On the other hand, a multiple of the market research indicator was used (2 to be exact) to capture an own-account component as well as a purchased services measure.

To estimate intangibles for the United Kingdom, Marrano, Haskel, and Wallis (2009) used figures from supply-use tables on business purchases of advertising and market research, and then excluded all classified advertising and assumed 80 percent of the remaining spending was investment. They also consulted a prominent source of media-structured advertising spending (WARC) and commented on the differences between it and the input-output (I-O) based estimates found in the UK's annual supply-use tables. The authors also commented on the sizeable difference between the ratios of advertising spending to GDP for the United States vs. the United Kingdom.

The INTAN-Invest/INNODRIVE estimates of investments in brand equity used spending on advertising media expenditure calibrated to both the UK study just mentioned and a comparable study for Sweden (Edquist 2009).[20] These studies find that advertising media expenditure understates total industry consumption of advertising services (as we shall also find for the United States based on tax data and I-O estimates, described below), and all told, brand investment was estimated as the sum of two components:

[20] Personal communication from Massimiliano Iommi (April 2013).

Box 2. Estimating nominal investment in intangible assets

An estimating equation for nominal expenditure was set out in Corrado et al. (2012) as:

$$
\begin{aligned}
P^N N_t &= \sum_{j=1}^{J} \mu_j (P^L L_{j,t} + P^K K_{j,t} + P^M M_{j,t}) \\
&= \sum_{j=1}^{J} \mu_j^{shadow} (P^L L_{j,t} + P^K K_{j,t} + P^M M_{j,t})^{own-account} + P_j^N N_{j,t}^{purchased} \\
&\cong \sum_{j=1}^{J} \sum_{s=1}^{S} (\mu_{s,j}^{shadow} (P^L L_{s,j,t} + P^K K_{s,j,t} + P^M M_{s,j,t})^{own-account} + P_j^N N_{s,j,t}^{purchased}) \\
&= \sum_{j=1}^{J} \sum_{s=1}^{S} (\mu_{s,j}^{shadow} \gamma_{s,j}^{own-account} \lambda_{s,j}^{own-account} OwnCost_{s,j,t}^{Indicator} + \gamma_{s,j}^{purchased} \lambda_{s,j}^{purchased} Purchased_{s,j,t}^{indicator})
\end{aligned}
$$

where the terms in the first line are as in Box 1 except now we show intermediate inputs because accounting for them is important for estimating production on own-account.

The second line illustrates that one needs to account for both purchased and own-account production and should, in principle, introduce a margin to place both on the same footing. The third line underscores the need to build up estimates by sector or industry. The discussion in this report is in terms of domestic business activity, a subsector of an economy.

The final line shows the basic estimating relationship used in this report. It acknowledges imperfect data on factor inputs when measuring own-account spending, and also imperfect data on purchased investment services. The variables superscripted "indicator" denote the underlying time series used in estimation; for instance, the indicator for investment on own-account may be wages or compensation.

The γ parameter indicates the adjustment to the indicator that is needed to transform it to sector gross output. This parameter can be, itself, a product of other parameters – a markup factor to account for the use of materials, and/or markup factor to account for the use of capital services. The latter may be sufficient to place the final result on the same footing as purchased services, in which case it is plausible to think of the innovator markup μ as being equal to one.

The λ parameter is the capitalization factor, namely, a parameter that adjusts a spending measure or indicator to a measure of investment—a fraction of revenues or employee time, say, devoted to the long-lived investment activities.

1. Advertising media spending times a MHW-Edquist factor (that exceeds one after accounting for consumption by the nonmarket sector) times a capitalization factor of .6 following CHS
2. Market research spending times 2, again following CHS

We need a fresh perspective on these procedures for several reasons: First, the most widely used U.S. time series on advertising expenditures—one that has been used in numerous studies

of intangibles, including CHS—was maintained by Robert J. Coen of Universal McCann (formerly McCann Erickson) and Coen retired in 2007. Coen's database is the granddaddy of media-structured advertising databases. Owing to improvements, analysis, and online accessibility due to Douglas Galbi in 2008, we refer to this source as Coen/Galbi. Multiple sources for updating the Coen/Galbi series are currently available, and one task of this investigation is to sort through the best source to use for U.S. intangible investment estimates going forward.

Second, time series estimates of compensation and employment by detailed occupation (marketing managers, etc.) are now more readily available (Corrado and Hao, forthcoming), making possible the introduction of improved estimates of own-account investment in strategic marketing and marketing research.

Third, looking at the United States in comparison with other countries raises several puzzles regarding comparability of data from alternative sources (originally stressed in the work on Great Britain, as previously noted). A deep dive into the U.S. data helps clear some of this confusion.

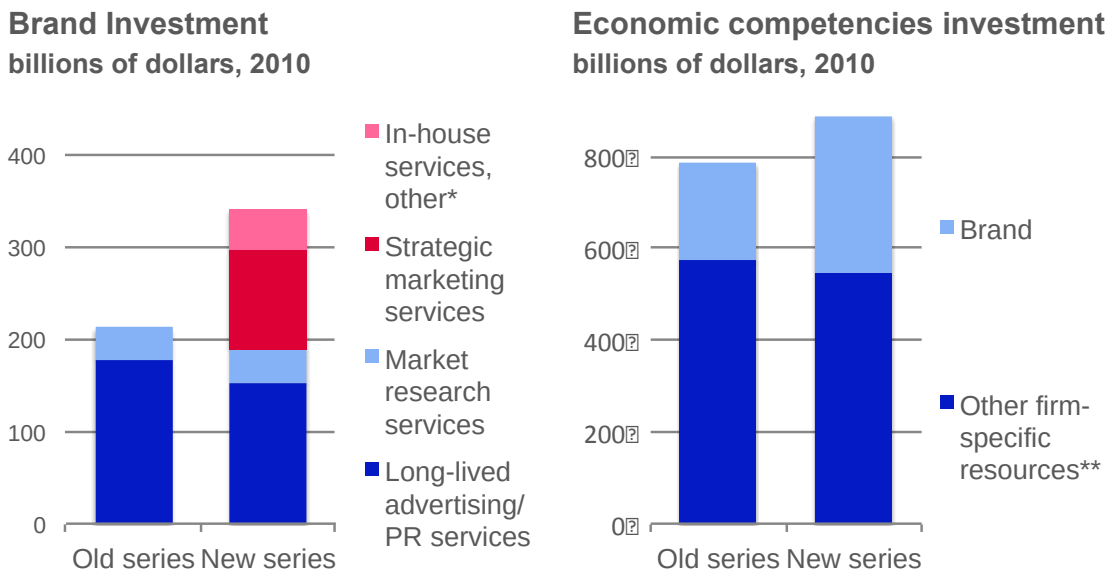
3.2 New U.S. results and multiple data sources

The new methods for measuring U.S. brand investment result in a series that is 60 percent larger than previous estimates in 2010 (figure 13, left panel). The major story behind the difference between the new and the old U.S. brand investment series is that strategic marketing services (whether in-house or purchased) are now counted as investments in brand rather than in organizational capital. Conceptually, the move does not change overall intangible investment but its impact on the analysis of brand is major.

The other important part of the story is that an in-house component for *all* aspects of marketing has been added. In the final results, the marketing research segment looks pretty much the same as previously estimated because the new in-house component based on compensation is about equal to the simple assumption used in CHS. The inclusion of other in-house marketing services, along with the improved methods for estimating the in-house production of strategic marketing services previously included in organizational capital, have the net effect of notably raising brand investment, and to a lesser extent, overall economic competencies (figure 13, right panel).[21]

[21] Estimation details are in the appendix. In the parlance of Box 2, the adjustment to the own-account indicator (compensation) to convert it to output ($\lambda^{own-account}$) is determined more rigorously, and the capitalization factors for both the own-account and purchased components ($\gamma^{own-account}$ and $\gamma^{purchased}$) were refined.

Figure 13. Accounting for the difference between the new and old U.S. brand investment series



** Strategic marketing and market research include both in-house and purchased components.*
*** Organizational capital and firm-specific human capital.*

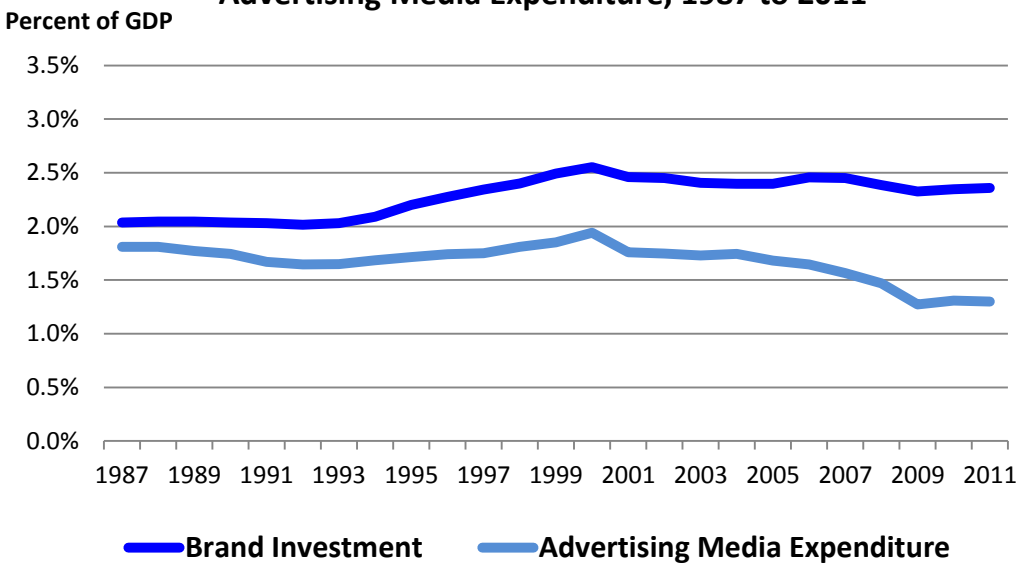
The purchased component, long-lived advertising, changes too. The primary move is to use an official source for advertising data, in this case, U.S. tax data on advertising expenses, which we note in the appendix includes all promotion expenses. Despite the widespread availability of advertising spending databases (WARC, Zenith, Kantar, etc.) we chose the U.S. tax data for two reasons: First, they have a very broad coverage, whereas *most* media structured databases do not include certain expenses (e.g., direct mail). Second, the rise of non-traditional media presents challenges to the media-by-media approach to measuring advertising. New channels (e.g., mobile, digital video) must constantly be added, suggesting the need for media structured databases to be benchmarked to authoritative sources and IRS is an authoritative source.

Our new results for brand investment were shown in Figure 5 as the sum of own-account and purchased components. Table 7 below details its derivation (following the methodology set out in Box 2), for which further details can be found in the appendix. The bottom line here is that our new series captures the move of marketing to in-house production, with the result that, from 2004 on, the new series sends very different signals than simple data on advertising media expenditure (figure 14).

Table 7. U.S. Business Brand Spending and Investment 2007-2011 (billions $, annual rate)					
Type of investment	**Indicator (1)**	**λ (2)**	**Business Spending (3)**	**g (4)**	**Business Investment (5)**
1. Own-account			**219.3**		**149.7**
a. Marketing managers and analysts time	Compensation	2.2	133.7	.8	107.0
b. Computer and media worker time (selected occupations, see table A1)	Compensation	2.2	85.6	.5	42.8
2. Purchased			**349.6**		**191.3**
a. Marketing consulting services	Estimated revenue for NAICS 541613[1]	.95	16.3	1.0	16.3
b. Marketing research services	Revenue, NAICS 541961	.97	16.6	1.0	16.6
c. Long-lived advertising services	Tax deductions for advertising expenses[2]	--	316.7	.5	158.3
3. Total (= 1 + 2)			**568.9**		**341.0**
4. Total as a percent of GDP			**4.0**		**2.4**

Source: Authors' elaboration of data from numerous sources. Method is as elaborated in Box 2, implementation is based on domestic business activity only. Components are independently rounded.
1. Estimate based on employment share of NAICS 54161 (Management consulting services).
2. Includes corporations, sole proprietorships, and partnerships. Data for the latter are estimates based on business receipts.

Figure 14. U.S. Business Brand Investment vs. Advertising Media Expenditure, 1987 to 2011



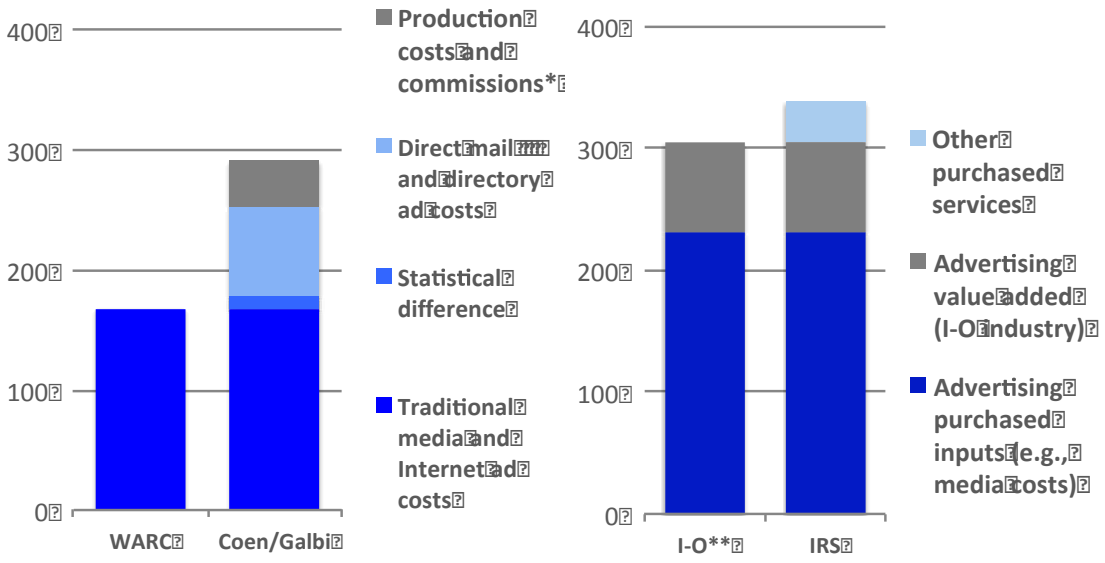
Note. Business advertising media expenditure is the Coen/Galbi/WARC media-structured advertising spending series less estimated spending by nonprofits and persons.

The multiple sources for data on advertising spending nonetheless create certain confusion, and in figure 15 we attempt to sort through some of the issues that arise. We use WARC data as an example of a typical media-structured source (the characteristics of WARC data are discussed in the appendix). On the left, we compare WARC with Coen/Galbi, using values for 2007, the last data point for the latter. We line these up, media by media, and find that the major difference between them is due to coverage. The statistical difference between comparable items covered is rather small.

What are the coverage differences? Direct mail, directory ads, and Coen's estimate of production costs and ad agency commissions (his miscellaneous category). The latter can be interpreted as advertising industry value added. On the right we compare two comprehensive sources for advertising activity, I-O and the U.S. tax data (mentioned above and labeled IRS the chart), for the same year, and also show a breakdown of I-O output into advertising value added and purchased inputs. Purchased inputs largely media and mail dissemination costs.

This comparative exercise yields three findings: First, Coen/Galbi includes channels not typically included in media-structured databases such as WARC (explaining some of the puzzles raised in the UK study). Second, I-O and Coen/Galbi are numerically very similar (and thus support the original CHS magnitudes). Third, although the U.S. tax data on advertising

Figure 15. Advertising measures by source
(U.S. business sector, billions of dollars, 2007)



*The Coen Miscellaneous category.
**Estimate based on 2002 benchmark I-O Use table (with redefinitions), the latest available as of this writing.

expenses are in the same ballpark as I-O and Coen/Galbi, the tax data seem to capture additional services.

Now suppose we wish to calculate a "factor" that adjusts WARC to a comprehensive measure of advertising services. Our findings on this score are as follows:

- I-O is 66 percent larger than spending recorded in media-structured databases, such as WARC, and the factor required is 1.8
- IRS is 85 percent larger than spending recorded in media-structured databases, such as WARC, and the factor required is 2.0
- These are *much larger* than the MHW-Edquist/INNODRIVE/INTAN-Invest factor, which is 1.39[22]

[22] The INTAN-Invest database is based on advertising media expenditure data from Zenith Optimedia, and the exact factor used there is 1.38.

3.3 Global brand spending and investment

We assemble a globally comparable database for analyzing brand investment in 63 countries. The database uses advertising data from WARC and marketing research data from ESOMAR, sources that are described more fully in the appendix. We are unable to include the newly developed components of the U.S brand investment series (the strategic marketing and other own-account components, i.e., the red and pink-shaded items in figure 13) and thus we use the existing approach to measuring brand investment described in section 3.1 for our global analysis.

The existing approach requires a harmonized I-O factor, however. Pending further international comparative work on the subject, we continue to use the INTAN-Invest factor (1.39) in our global analysis. Although this distorts results for the United States, the distortion and direction of bias is known. We suspect that direct marketing, especially direct mail, and possibly even value added in advertising, looms much less large in many other countries than in the United States, but we do not believe we have accumulated enough evidence to fold in our new estimates for the United States into the harmonized factor used in the existing approach.

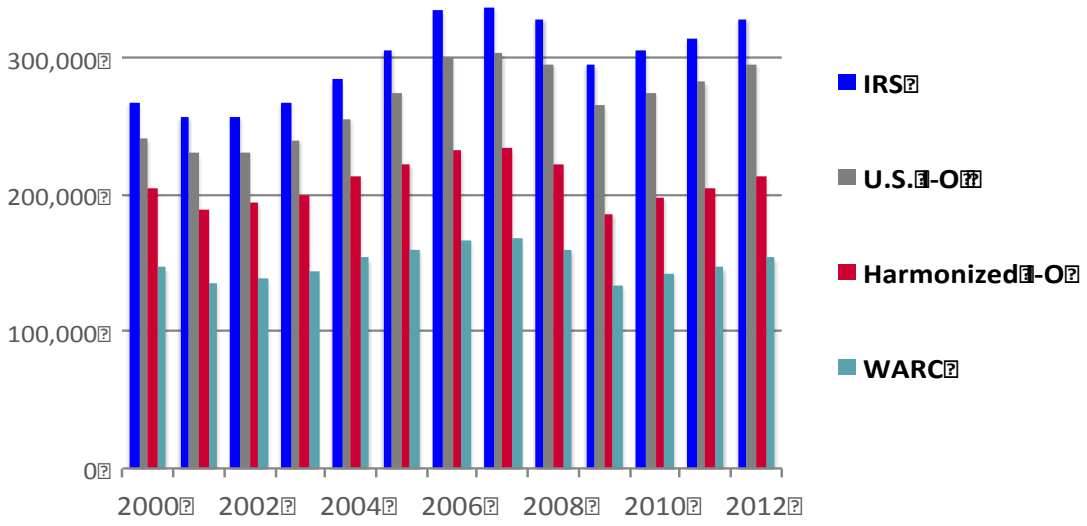
How much do harmonized estimates of long-lived advertising distort results for the United States relative to the new series developed for this report? Figures 16 and 17 provide answers. Even though the differences in U.S. ad spending according to data source are rather large, when mapped to long-lived advertising services, the differences are much smaller. (NB: Each figure shows *levels* of spending and investment in millions of dollars from 2000 to 2012; relative to U.S. GDP, 100,000 million is 0.8 percent of the average value of GDP during that period).

3.4 Brand investment and capital

We now review how we determined capitalization factors and depreciation rates for our new U.S. estimates of spending on brand. A capitalization factor is the fraction of spending that is appropriate to capitalize as long-lived investment (the column 4 entries for the relevant lines of table 7). The depreciation rate is the rate at which these investments lose value as they age, i.e., holding time and pure price change constant, the rate at which they lose revenue-generating capacity as they age.

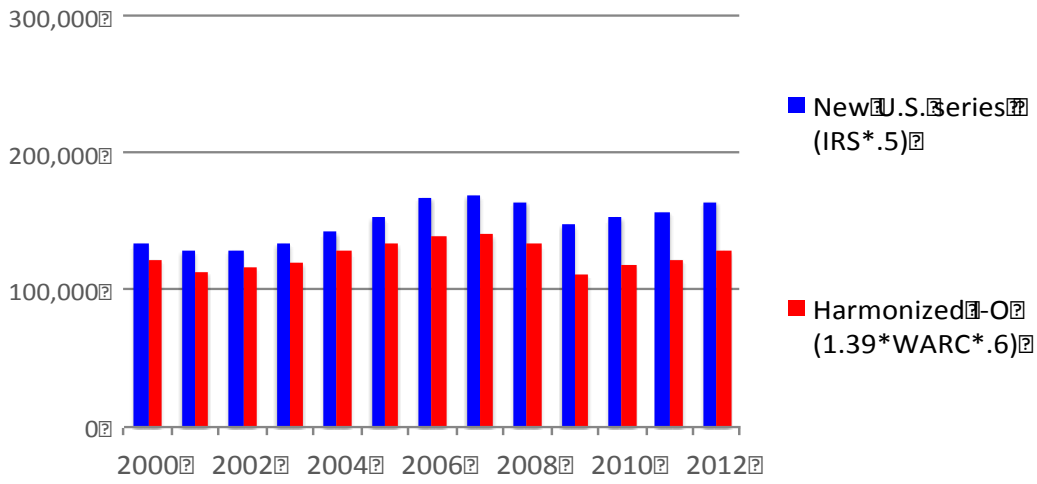
We set the capitalization rate for total advertising and for own-account marketing managerial input to .5, that is, 50 percent of these items are treated as investment in promotion costs. A .5 capitalization factor is consistent with the UK intangible asset survey (Awano *et al.* 2010). The application of .5 to own-account marketing managerial input reflects our lack of access to more detailed occupation data; in future work, we may be able to determine a more reliable split between promotion investment and production cost for this category. The new figures for

Figure 16. U.S. advertising expenditure by data source (millions of dollars, 2000 to 2012)



Note. Harmonized I-O refers to series used for purchased advertising in global analysis.

Figure 17. U.S. long-lived advertising services by study and data source (millions of dollars, 2000 to 2012)



The structure and methodology of the new U.S. series set out in Intable 3; see also the appendix to this report.
Harmonized I-O refers to series used for long-lived advertising in the comparative global analysis in this report.

purchased marketing services were derived as investment and capitalization factors are implicit. These values for capitalization factors are shown in column (4) of table 7.

As to depreciation rates, we set the geometric rate of depreciation to .44, consistent with a service life of 3.8 years (Hulten/Wykoff basis, i.e., $d = 1.67/3.8$; see footnote 9). This service life is slightly longer than previously used as a result of several considerations, including the fact that we are capitalizing a smaller share of total spending. The rate is consistent with the UK intangible asset survey, when one considers that its literal read needs to be adjusted for gestation lags (average content development time, implementation time, and "run" time).

With regard to the implications of these changes, the lower capitalization factor on advertising does not materially diminish existing macro estimates of investment in brand equity because the new capitalization factor is for application to broader indicator, i.e., one that includes own-account, public relations and other promotional costs not included in the costs paid to media.

The new estimates for marketing are rigorously estimated, more so than previously available estimates. Much of this component was previously included in another category, yet the new methods do have the net results of raising overall intangible capital. But the major contribution of the new methods used to estimate brand equity in this report is that now the share of brand investment in total intangible investment is substantially larger (as per discussion in section 3).

Section 4. Global Analysis

We estimate the world invested $417 billion or .59 percent of world GDP in brands in 2011 (purchased component only; excludes strategic marketing)—a level and rate of spending that will continue to grow as more and more economies progress from mercantile and agrarian societies to industrial powers. As in previous industrial transformations in previous centuries, changes in distribution (and in the marketing associated with distribution and sales) are expected to be as marked as changes in production (Chandler 1977, Corley 1988).

The global analysis of this section is based on the internationally comparable data on advertising and market research spending described in the previous section; they are our closest available indicators of investments in brand. As described in the previous section, when combined as in the intangible capital literature, they yield an indicator of brand investment (purchased component excluding strategic marketing) for 63 countries. As previously shown (figure 7), the indicator suggests brand investment dropped relative to GDP in high-income countries during the recent economic crisis and remained at a low rate through 2011.

In this section, we will analyze this finding more carefully and also discuss the relationship between the level of economic development and our indicator of brand investment across time and across countries. First, we examine the trend of advertising spending in the past 75+ years

in the U.S, and look at its distribution by industry for corporations over 30 years. Second, we analyze the trends in the indicator for selected countries; then we present our regression results. Finally, we use China as an example to discuss the impact of economic institutions on advertisement in emerging economies.

4.1 Historical patterns and recent trends

Brands have a long history (Box 3), as does advertising. Although the advent of regularly published newspapers in the 16th century provided the perfect vehicle for advertising, the advertising industry (ad "agents") did not emerge until the mid-19th century with the start of the Industrial Revolution. By the turn of the century the U.S. advertising business was flourishing and has continued to grow and prosper since then. Figure 14 shows the ratio of advertising to GDP from 1935 to 2011. No long-term trend emerges, but the ratio is cyclical and the fall off in recent years difficult to interpret as a consequence.

The supplementary line on figure 18 shows business spending on formal R&D. The R&D propensity has a rather different trajectory than the advertising propensity, but this is not because advertising is not related to innovation. As measured by patent data from the USPTO, the period from 1850 to 1920 was a "golden age of invention" not matched in subsequent history until a "post-industrial" innovation era began to emerge starting in 1985. The explosion of inventive activity during the industrial revolution, together with the evolution of mass distribution (Chandler 1977), gave rise to a need for information by consumers, and thus advertising.

The fall off in U.S. advertising propensity in recent years could be a result of the great recession, which hit durable goods production and distribution particularly hard. Some support for a cyclical explanation is provided on figure 19, which shows the industry distribution of advertising by major sector. Advertising in manufacturing and trade fell off sharply after 2007. But the fall off is layered on what seems to be a downtrend in these sectors since 2000, which may reflect the change in the industrial landscape away from the production and consumption of manufactured goods.

The fall off in U.S. advertising propensity shown in figures 18 and 19 could also reflect the fact that spending on media has been cut back as expenditures on strategic marketing have grown (both in-house and purchased). We have already seen that advertising media expenditure apparently does not function well as an indicator of U.S. brand investment in the modern Internet/content marketing age (see again figure 14).

Box 3. History of Brands

The word "brand" comes from "brandaz". It means "fire, flame; firebrand, piece of burning wood, torch." Cattle and livestock were marked with burning irons, and that was one of the major meanings of brand. Brand also meant marking criminals. People once thought of the word "brand" in a bad sense. But as the market economy grew and prospered, brand came to mean the reputation of a company (corporate brand) or the reputation of a product (product brand) and usually in a good sense. Brands are an indispensable way for producers to communicate with consumers about products. In 2011, the business sector of the U.S. spent 0.98% of GDP or $147 billion on one type of investment in brand, advertising. In the same year, the whole world spent $485 billion for the dissemination of advertising.

The history of branding goes back about 5000 years. Babylonians advertised as early as 3000 BC. Marking cattle and livestock started as early as 2000 BC. Around 1300 BC, pottery and porcelain were printed with potter's mark in China, Greece, Rome and India (Figure 1). During medieval times, printers and paper-makers used marks and watermarks to signify their works.

Brands became more and more important as the market economy grew. In 1777, a brewery company registered the trademark *Bass* in the U.K. (Figure 2). *Bass* claims to be the first registered trademark in the world. In early 19th century, producers of patented medicine and producers of cigarettes started to build up their own brands. In the mid- and late-19th century, companies of consumer products such as P&G started to advertise their products. Some brands survived the ups and downs of economic history, and still stand as the top brands of the world. Examples are Louis Vuitton (French, 1854), Nokia (Finnish, 1871), Lucky Strike (American, 1871), Lipton (British, 1871), Coca-Cola (American brand, 1886), Kodak (American, 1889), Chevrolet (American, 1911), BMW (German, 1917), Mercedes-Benz (German, 1926), Samsung (South Korean, 1938), Sony (Japanese, 1946), and Tide (American, 1949).

And brands can extend to the retail experience itself. In 2010 Apple filed for a trademark for its Apple Store interior design and layouts, and on January 23, 2013, a service mark was registered for a "retail store featuring computers . . . " by the USPTO.

Figure 1: Potter's marks on Chinese antique porcelain

Figure 2. Brands

But while structural change is undoubtedly part of the story, figure 20 suggests the substitution just described may be a U.S. phenomenon, at least to date. When the internationally comparable WARC and ESOMAR figures are used to construct a brand investment indicator for a wide range of countries (including the United States) and results are compared, the recent drop off in the United States stands out. The indicator results show that neither the Euro Area nor Japan, nor China for that matter, experience a notable drop off in recent years. On the other hand, the pattern in the United Kingdom looks similar, but not in degree.

The U.S. (and UK too) pattern could be a manifestation of more fundamental issues. First, we have seen that in the United States, *marketing* indicators do not signal weakness in recent years, and our internationally comparable brand investment indicator suffers in that it does not capture marketing (except via marketing research). Second, rapidly growing *mobile and social media* marketing reportedly is used more intensively in the United States; to the extent these expenses are more likely to be on own-account (with substitution away from purchases and traditional paid media), the underlying trend will also be missed by our brand investment indicator—with a more pronounced impact on the U.S. measure.

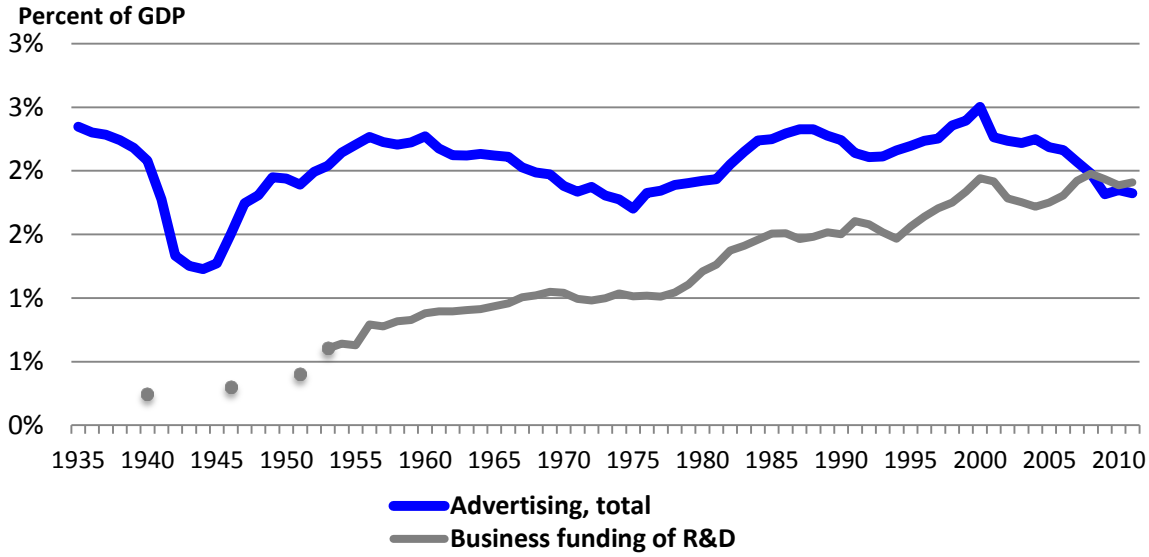
Third, still another possibility is that the underlying return on investment (ROI) on marketing and promotion expenditures (including advertising media expenditure) has improved with access to greater data through Internet search and social media (e.g., targeted advertising). [23] This suggests the decline in the ratio of advertising spending to GDP reflects improved productivity.[24] We leave for later work a more thorough investigation of whether the results for the U.S. are a measurement or ROI issue and turn now to look at patterns across the globe.

4.2 Underlying global relationship

When we look brand investment relative to GDP by individual country according to level of economic development as measured by real GDP per capital (2012 PPP$) as we did previously in figure 8, an underlying relationship emerges. Figure 21 is similar to figure 8 except all data points for the 17 countries are plotted (i.e., 1988 to 2011). Figures 22 and 23 are in turn similar to figure 21 and show the underlying raw data used to construct the brand investment indicator,

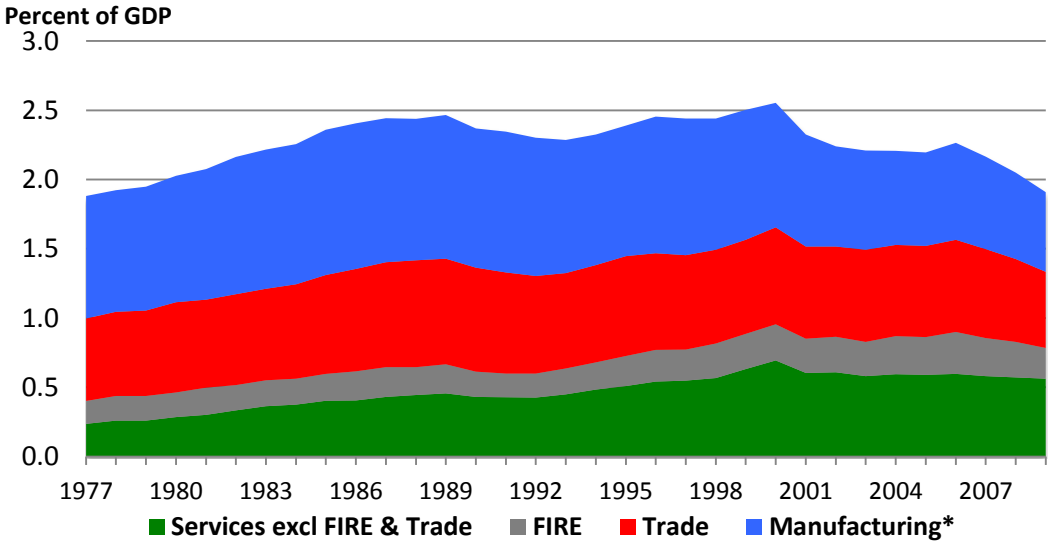
[23] Goldfarb and Tucker (2011a, 2011b) document the effectiveness of targeted advertising and also show that greater privacy regulations reduce the effectiveness of ads. The latter suggests that differences in regulations could be a factor in some of the global differences that we see.
[24] Note that this would imply that "more" brand enhancement is taking place per advertising dollar expended. In other words, the conversion of dollar investment figures to real terms is problematic—and the contributions of brand equity in section 1's sources-of-growth decompositions are misstated. In related work, Corrado *et al.* (2011) argued that one should factor in the impact of R&D productivity when constructing a price index for R&D. Using data for the UK from 1985 to 2005, they found doing so had a substantial impact.

Figure 18. U.S. Advertising Expenditure, 1935 to 2011



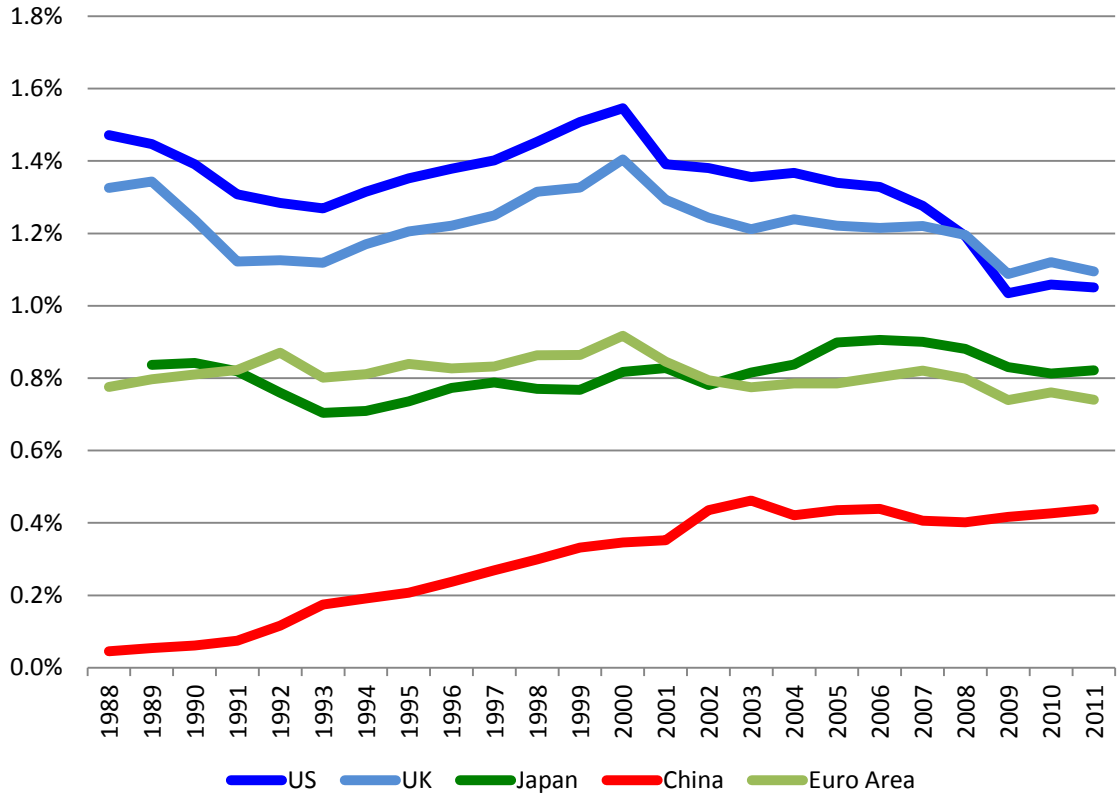
Sources—Advertising expenditure is the Coen/Galbi series, extrapolated by WARC. R&D data back to 1959 are from the BEA/NSF R&D satellite account (Moylan and Robins 2007). Data from 1953 to 1959 are from NSF, and prior to that, from Terleckyj (1963); data points after 2007 are authors' estimates based on NSF statistical reports and Battelle forecasts.

Figure 19. U.S. Corporate Advertising Expenses by Industry Sector, 1977 to 2009



Source: Authors' elaboration of data issued by the U.S Internal Revenue Service. Series plotted conform to NAICS. FIRE=Finance, insurance and real estate (including holding companies). *Includes other goods-producing industries (agriculture, mining, utilities, and construction) whose combined advertising spending is very small (.04% of GDP).

Figure 20. Brand Investment Indicator, Selected Countries, 1988 to 2011



Note. Purchased component indicator.
Source. This report. Series are calculated similarly across countries and do not incorporate this report's new U.S. series, nor do they necessarily correspond to INTAN-Invest.

advertising and market research expenditure (as percent of GDP). For advertising expenditure the data go back to 1981.

Figure 21 shows a strongly positive relationship between the brand investment indicator and real GDP per capita, as does figure 22 (advertising), and after a certain point, figure 23 (market research). For the countries in the upper right quadrant of the figures showing brand investment and advertising spending, the propensities graphed seems to reach a threshold and then to "arc back" at the highest development levels shown. The relationship between marketing research propensity and level of economic development displays, if anything, the opposite pattern, that is, an increasing propensity with the level of economic development. We previously reviewed some reasons why we might expect to see a generally positive relationship between advertising/marketing research propensities and the level of economic development; see insert box on page 11 (Section 1).

4.2.1 Details

There are 17 countries in figures 21, 22, and 23, including 12 advanced economies (Australia, Canada, Finland, France, Germany, Italy, Japan, Portugal, South Korea, Spain, the U.K. and the U.S.) and 5 emerging economies (Argentina, Brazil, China, India, Russia). Most of the 17 countries have advertising data available from 1981 to 2011. For the U.S., the data are from 1971 to 2011 because we extended the U.S. data back to 1971 to take advantage of its rich history of advertising data. Most of the countries have market research data back to 1988, again with the exception of the U.S, which we extend back to 1985.

In figures 21-23, note first that Anglo Saxon countries are mostly located in the upper right region of the charts. Brand investment and advertising spending in the U.S. first increased with GDP per capita, and then decreased after GDP per capita exceeded $45,370 (2012 PPP$, The Conference Board's *Total Economy Database*, January 2013 release). The U.K., Canada, and Australia follow a similar pattern. Continental European countries are mostly located at the middle right region. Compared with other continental countries, Portugal has a steep slope between GDP per capita and brand investment, and its GDP per capita is generally lower than other continental countries. Finland and Japan are also at the middle right region. Part of South Korea (earlier years) lies at the region of emerging markets, and part of it (recent years) is at the region of continental European countries.

BRIC countries are located at the lower left region. For Brazil, data are only available after 2000, and an increase in slope is not reflected in the figures. For Russia, advertising spending increased with GDP per capita, and then decreased in recent years. China and India are among the fastest growing economies in recent years. GDP per capita is low in these countries, and they are located at the very lower left corner of the chart. Note, too, that their brand investment and advertising propensity increased steeply with GDP per capita for a time but has leveled off or declined in recent years. Still, for all the data points on the figure, a generally positive relationship exists between investments in brand and GDP per capita.

Figure 23 covers the same 17 countries but reports marketing research propensities, and displays the same patterns in terms of country groupings—in the upper right region are the UK, France, Germany, the US, Australia, Finland and Canada; in the middle section are Italy, Spain, Portugal, Japan and South Korea, and at the lower left corner are the BRICs and Argentina. On the whole the graph displays an increased propensity to engage in market research as economic development takes place, but the experience of certain countries runs counter to that (Finland, Australia, and Canada).

A final observation is the following: The steep slopes of China and India in figures 21 and 22 are similar to the slope of Portugal when Portugal had a relatively low GDP per capita in the 1980s. But for a similar advertising propensity in the 1980s, Portugal had a higher GDP per capita than China and India. One reason for this might be that globalization in the past 30

years has put China and India on a different trajectory, as they face competition against the many strong brands of advanced economies. Indeed, in the case of China, some speculate that Chinese firms are losing their domestic market to foreign products because of poor brand management.[25]

Before returning to the subject of China and concluding this report, we present regression results that display the robustness of the trend suggested by these figures.

4.2.2 Regression results

A regression of a country's rate of brand investment on the natural logarithm of its real GDP per capita and dummies for fixed time and country effects confirm the positive relationship described above. The fixed time effects control for common business cycle influences and the country effects control for country characteristics—for instance, for the fact that competition through brand may be more intense in some countries. The objective of the regressions is then to describe the data in a simple way. We did not attempt to model threshold effects except through use of a semi-log functional form.

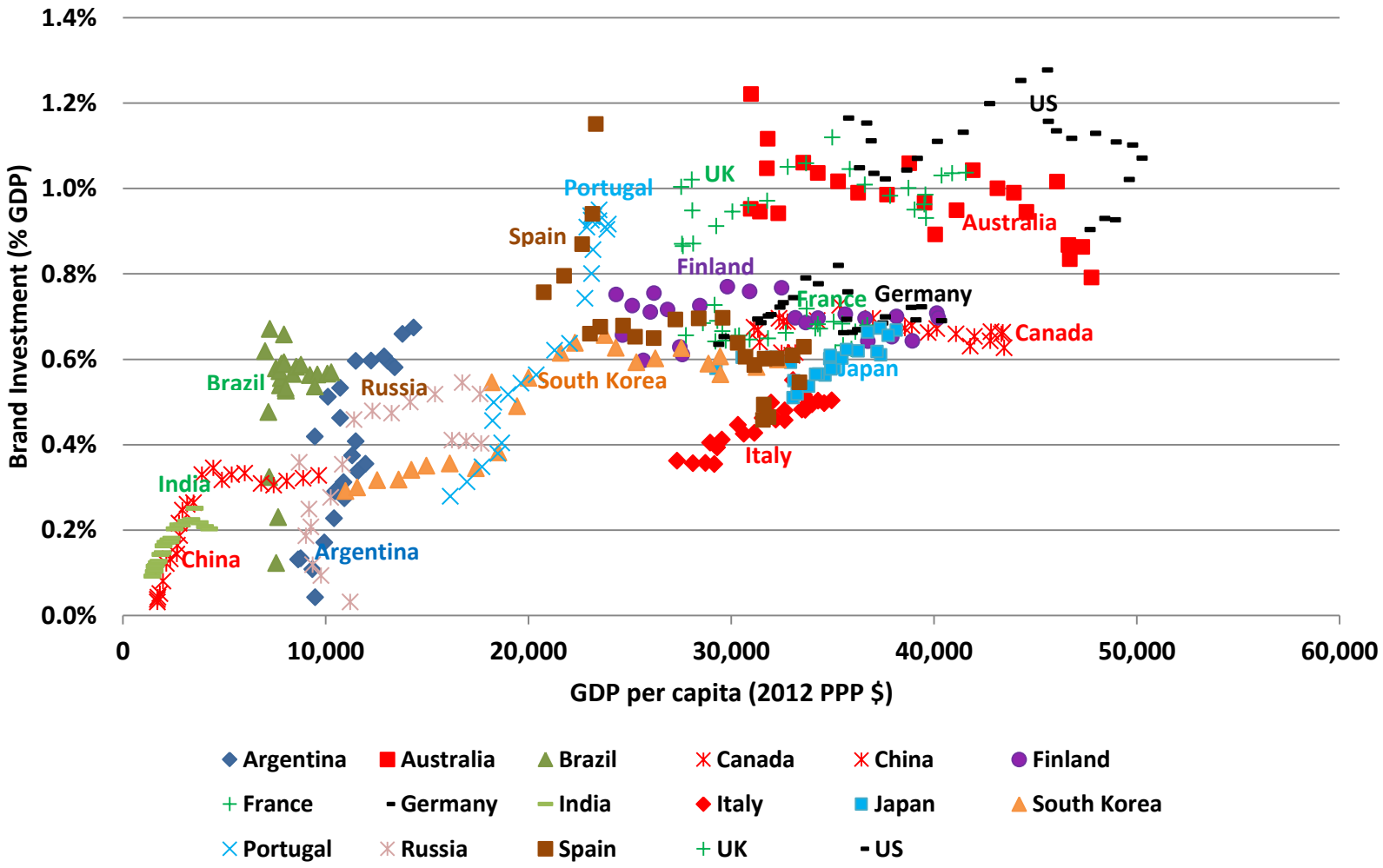
The results are displayed in Table 8. Note first, that when we blend the data on advertising and market research expenditure for 80+ countries, missing values and/or mismatched countries leave us with 63 countries for which we can construct a brand investment indicator for regression analysis. Second, no matter what combination of dummies for fixed effects is used, all estimated coefficients are significant at the 95 percent level and underscore the statistical robustness of the associations described in this section. Third, comparing the fit of the regressions shown in columns (1) vs. column (2), and in column (3) vs. column (4), suggests that country characteristics are an important influence on brand investment.

Finally, column (3) of the table implies that holding time and country characteristics constant, a doubling of real GDP per capita is, on average, associated with a sizeable increase in brand investment, namely .28 percent of GDP. Note that each gridline in figure 18 is .20 percent of GDP, so (ignoring country effects) if Russia jumped to the level of development now enjoyed by Spain, its rate of investment in brands will rise to be about commensurate with Spain, etc.

Fixed effects regressions are a standard way to control for endogeneity and common influences on dependent and explanatory variables, but note that our time dummies (which are there to pick up common business cycle effects as well as pure time effects) do not explain

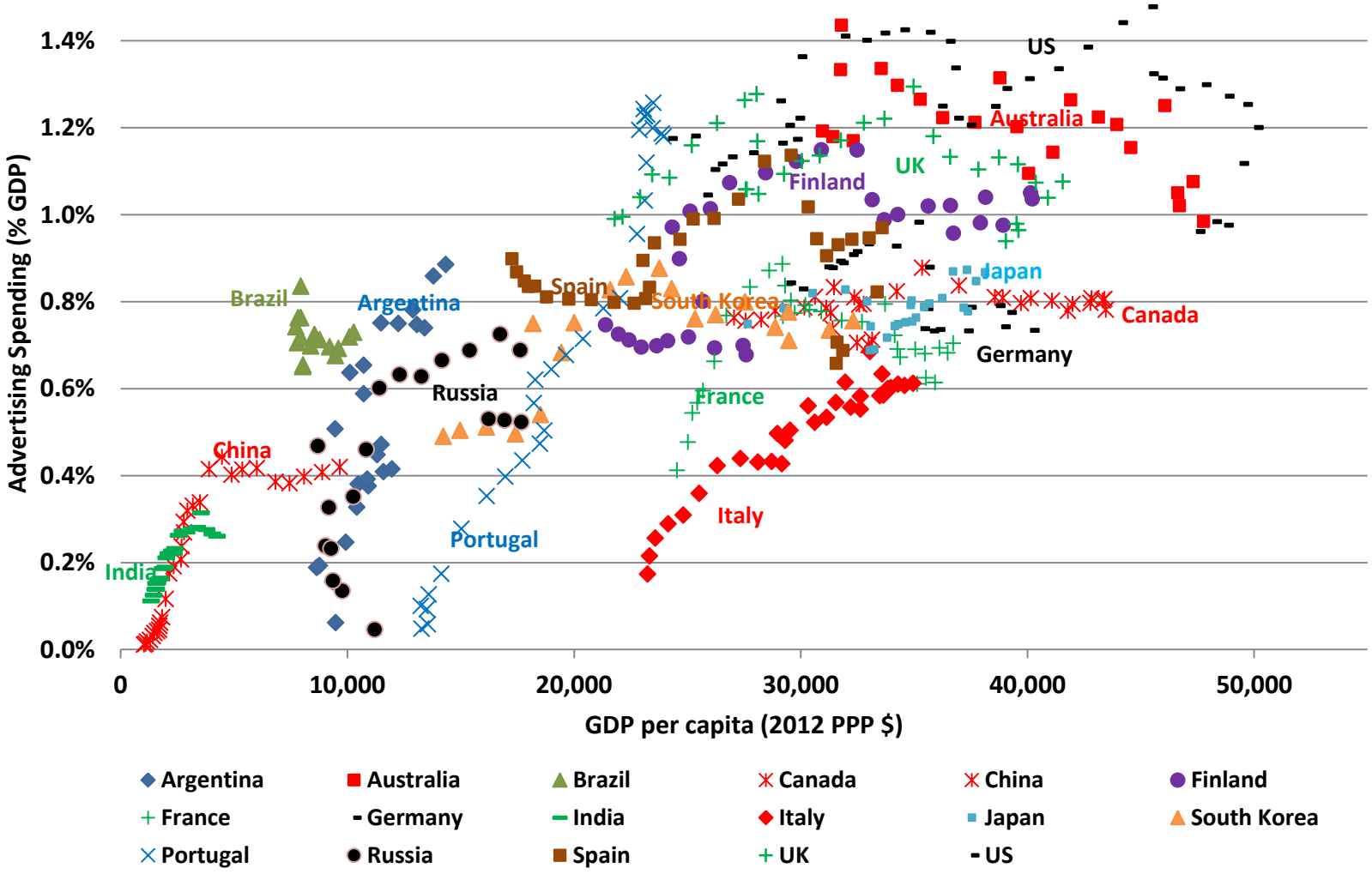
[25] Craig Stephen, 2012. Chinese getting tired of 'Made in China'. Market Watch of the Wall Street Journal, May 06 2012. Available at http://articles.marketwatch.com/2012-05-06/commentary/31596108_1_mainland-hong-kong-li-ning

Figure 21. Brand Investment Indicator and Level of Economic Development, 1988-2011



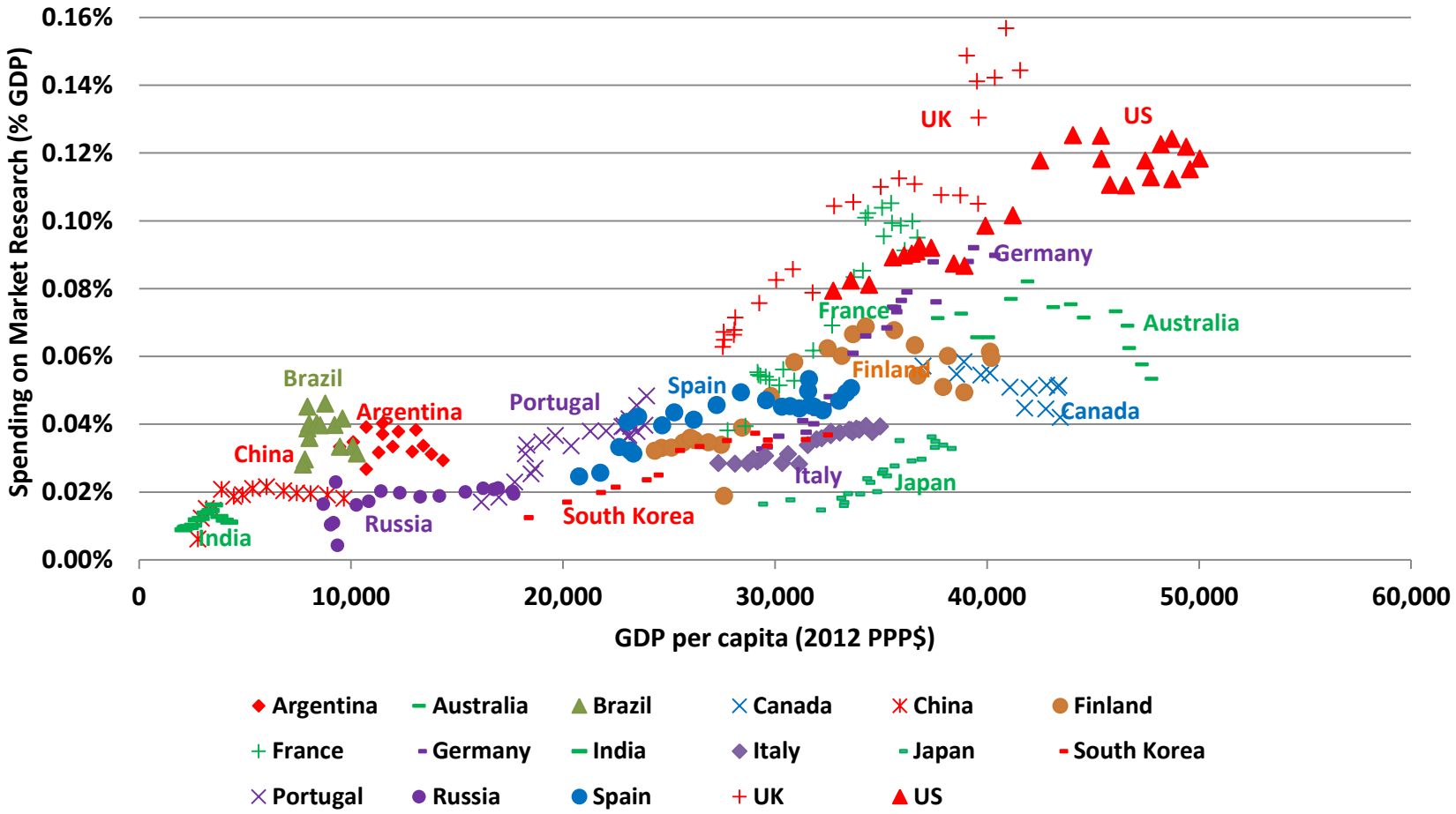
Note. Series plotted is an indicator of purchased investment (excluding strategic marketing). US estimates begin in 1971. Source. This report. Series are calculated similarly across countries and do not incorporate this report's new U.S. series. Real GDP per capita is from The Conference Board's Total Economy Database.

Figure 22. Advertising Media Expenditure and Level of Economic Development, 1981-2011



Source. Authors' elaboration of data from WARC and selected other sources; see text. Real GDP per capita is from The Conference Board's Total Economy Database.

Figure 23. Market Research Expenditure and Level of Economic Development, 1988-2011



Note. Marketing research covers purchased services only. Most European countries and the US have data on marketing research back to the 1980s, but the other countries have data only back to 1988.
Source. Authors' elaboration of data from ESOMAR and U.S. Census Bureau. Real GDP per capita is from The Conference Board's Total Economy Database.

Table 8. The Effect of Real GDP per Capita on Brand Investment, 1988 to 2011				
	Without year dummies		With year dummies	
	With country dummies	Without country dummies	With country dummies	Without country dummies
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
1. LN GDP per capita (2012 PPP$)	0.24 (8.74**)	0.11 (8.56**)	0.28 (5.55**)	0.12 (9.01**)
2. Constant	-1.69 (-6.63**)	-0.43 (-3.37**)	-2.13 (-4.65**)	-0.58 (-4.07**)
R-square	0.86	0.09	0.86	0.10
Number of observations	942	942	942	942

Note: The regression uses data for 63 countries and has robust standard errors. The dependent variable is brand investment (purchased only, excluding strategic marketing) as a percent of nominal GDP. Real GDP per capita is expressed in natural logarithms.
Sources: Brand investment, this report. Real GDP per capita (corrected for price differences across countries) is from The Conference Board's Total Economy Database (January 2013 release).

Table 9. The Coefficient of LN Real GDP per capita using Instrumental Variables and Disaggregation by Country Groups, 1988 to 2011					
		Without year dummies		With year dummies	
Type of regressions	# Countries	With country dummies (1)	Without country dummies (2)	With country dummies (3)	Without country dummies (4)
All countries					
1. OLS	63	0.24 (8.74**)	0.11 (8.56**)	0.28 (5.55**)	0.12 (9.01**)
2. IV	63	0.21 (8.12**)	0.11 (8.54**)	0.23 (4.83**)	0.11 (9.14**)
High-income countries					
3. OLS	33	0.25 (7.00**)	0.21 (8.64**)	0.32 (3.77**)	0.21 (8.36**)
4. IV	33	0.23 (6.60**)	0.20 (8.60**)	0.29 (3.64**)	0.21 (8.53**)
Middle-and-low income countries					
5. OLS	28*	0.22 (6.09**)	0.12 (8.38**)	0.24 (3.54**)	0.13 (8.46**)
6. IV	28*	0.19 (5.70**)	0.12 (8.23**)	0.18 (3.18**)	0.13 (8.87**)

Note: The regressions have robust standard errors. The dependent variable is brand investment (purchased only, excluding strategic marketing) as a percent of nominal GDP. Real GDP per capita is expressed in natural logarithms. The instrumental variables are respectively ln(gdpc) lagged one, two and three years. High-income countries have 33 countries and 630 observations, while middle-and-low countries have 30 countries and 312 observations. Among the middle-and-low countries. There is only 1 low-income country, Kenya. We drop two outliers in the regressions of middle-and-low income countries and end up with 28 countries. The two outliers are Uruguay and Kenya. They have unusually high investment in brand.

Sources: Brand investment, this report. Real GDP per capita (corrected for price differences across countries) is from The Conference Board's Total Economy Database (January 2013 release).

much in this regression. This of course does not mean brand investment is not cyclical—it is, and that is why we scale it by GDP. But what we see in figure 20 (page 49) is a hint that brand investment in *some* countries is procyclical. If procyclicality is indeed a characteristic of brand investment in some countries, we need to try to correct for its influence on the estimated coefficient on LN real GDP per capita. Another possibility is misspecification; the semi-log form may not be picking up the complexity of the threshold effects that are going, or, as suggested in the previous analysis, it is possible that emerging countries are on a different path than previously traced out by the now high-income countries. Finally, measurement error may be impacting our results.

We thus estimate the regression using instrumental variables (IV) and also disaggregate the sample by country group: The IV regression is very simple; we use three lags of log of real GDP per capita as instruments, and we do this for the disaggregate regressions as well as for the main regression reported in table 8.

Table 9 presents the results of these robustness checks. Only the coefficients on LN real GDP per capita are shown. Looking at column (3), comparing rows 1 and 2 shows that the coefficient on LN real GDP is .23, slightly lower than the 0.28 using OLS, and significant at the 95 percent confidence level, suggesting that the regression does not suffer much from endogeneity bias. As to the comparison among country groups, rows 3 through 6 examine the stability of the coefficient's implied threshold effects, and also investigates the role of measurement error on the assumption that high income countries have better statistical systems and more accurate measurement of real GDP corrected for price differences across countries. The good news is the column (3) coefficient for high-income countries, at .32 for OLS and .29 for IV again remains significant at the 95 percent level and varies within a narrow range. The same can be said for the OLS result for middle-and-low income countries (.24) but less strongly when IV is used (.18). This comparison suggests the possible presence of measurement error and difference in threshold effects across the two groups, but all in the message of table 9 is that the rate of brand investment in a country is strongly related to its level of economic development as measured by real GDP per capita.

4.3 China

A determinant of advertising spending in emerging economies is economic institutions, especially when the market economy is far from mature. We use the example of China to illustrate how economic institutions play an important role in both the spending on advertisement and the development of the advertising industry in emerging economies.

China was a planned economy until December 1978, when the Chinese government instituted economic reform. The first newspaper advertisement after reform was for Tianjin toothpaste, printed at the bottom of the 3rd page of the January 4th issue of Tianjin Daily in 1979

(reproduction below; courtesy of Jinhua Times, 2008[26]). The Tianjin Daily issued the ad to make money to build apartments for its employees. (In socialist China, each organization took care of the housing, healthcare and even family relationship of their employees.) Not surprisingly, the employees of Tianjin Daily enthusiastically supported the advertising business. Other newspapers quickly followed. According to China's National Bureau of Statistics, advertising spending increased rapidly thereafter, from 0.01 percent of GDP in 1981 to 0.44 percent in 2003 (figure 20).

The structure of the advertising industry limited its expansion, and advertising spending relative to GPD did not expand after 2003. The Chinese government did not regulate or support its advertising industry until very recently. Furthermore, advertising firms have had almost no access to bank loans or the capital market and have relied instead on their own accumulated cash flow to expand business (Ding 2005). Most advertising firms are either private or collective firms, not state-owned enterprises, and also are very small in size. According to the State Administration for Industry & Commerce, from 2006 and 2010, the average advertising firm had 6 employees and 963,375 RMB (about $0.12 million) in revenue.

China slowly is losing its competitive advantage in low labor costs. Many believe that brand development is essential to its continuing growth as an industrial power, and the Chinese government plans to support its advertising industry. The government's plan is to have by 2015 at least 10 advertising firms with annual revenues exceeding 5000 million RMB (about $750 million, at least 50 firms with annual revenues exceeding 1000 million RMB (about $150 million), and at least 100 firms with annual revenues exceeding 100 million RMB (about $15 million).[27] This is a very ambitious plan, and even partial success could result in a notable

[26] Available at http://news.xinhuanet.com/politics/2008-12/17/content_10515661.htm

[27] The Twelfth Five Year Plan on the Development of Advertising Industry, issued by the State Administration for Industry & Commerce in 2012 is available at http://www.cnadtop.com//news/vision/2012/6/19/01b85a46-f137-4075-9e9b-1d73fa5bdd2f.htm

boost to Chinese business brand equity. Needless to say, the planned increase in advertising in China will benefit Chinese society only to the extent it creates meaningful and accurate information about China's businesses.

Conclusion and future direction

Brand building is one of the key differences between modern market economies and agrarian and mercantilist ones. Brands help consumers and investors gather information about products, help companies to expand markets, and help innovators to launch new products. Brands contribute to the growth of a company through a dynamic interaction with other business activities, which in turn affects the value of brands.

Based on internationally comparable data on spending for advertising and market research, we estimate the world invested $417 billion or .59 percent of world GDP in brands in 2011. We find that brand investment is positively correlated with the level of economic development measured by GDP per capita, and that as countries double their real GDP per capita, brand investment as a percent of GDP increases 0.3 percentage points. And an analysis of economic growth finds that the contribution of brand is comparable to that of R&D in most advanced economies.

Our internationally comparable data on brand investment is limited in that spending on social media and strategic marketing are not included. As these forms of brand building are reportedly rapidly expanding of late, we take advantage of comprehensive data available for the United States and fill in this important gap. We find that U.S. firms have been building in-house capability in these areas while decreasing spending on advertising in mass media. Possibly to support the in-house capability, we also find that purchased marketing consulting services has grown very rapidly over the years. All told, our new U.S. estimate for brand investment is 60 percent larger than the estimate based only data for advertising and market research.

In conducting the foregoing work, we found many gaps in the available data and analysis. We have three main observations on the future direction of work in the area of brands and economic growth: First, we need a deeper economic understanding of branding and its interaction with other intangible assets. Similarly, we need a deeper understanding of the channels whereby brands convey new information and lead to positive impacts on overall economic growth. Second, our knowledge about the rate at which investments in brand depreciate is very deficient, requiring that new firm level datasets be developed and analyzed with the key distinction between product and corporate brands borne in mind. Third, we need improved global datasets of investments in brand, i.e., including all forms of marketing/PR,

covering the new communication channels, and of course, counting both in-house production as well as market-mediated purchased services.

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Appendix

A.1 U.S. spending measures

We consider first the measurement of advertising spending in the Untied States. The initial observation on U.S. advertising is for the year 1840 according to the U.S. Historical Statistics, which indicates Robert J. Coen as the source of its estimates.

Data on advertising are usually structured by media. The major media types in Coen's U.S. advertising data are as follows (alphabetical order):

1. Direct mail
2. Internet
3. Magazines
4. Miscellaneous (includes cinema)
5. Newspapers
6. Out-of-home
7. Radio
8. Television
9. Yellow pages

As noted previously, mobile and social media advertising are mentioned frequently in recent press reports, and we also note their relative prominence in the 2012 *Direct Marketing Statistical Factbook* and recent press releases from the Internet Advertising Bureau. Media structured databases are beginning to capture these categories, as the use of multimedia and integrated marketing has been growing at rapid rates and is expected to continue to grow relative to traditional media in the future.

a. The Coen/Galbi advertising data

Coen's U.S. advertising estimates structured by media begin in 1935. A review of the Coen advertising data conducted in the early 1960s by David M. Blank (then director of economic analysis at CBS) validated the estimates for major media categories (print, direct mail, and radio/TV), noting that the 1935 figure "rests upon data gathered by the famous Borden study (Borden 1942) that invested substantially more resources in determining the mid-1930's level of advertising expenditures than has been the case since that date" (Blank 1963, p. 34). Blank went on to comment (also p. 34) that the miscellaneous category is "a somewhat arbitrarily defined category that comprises the *cost of corporate advertising departments*, transportation advertising, and other unspecified expenses." [Italics ours.]

More recently, Douglas Galbi of the U.S. Federal Communications Commission conducted a review of the Coen data and also puzzled over the makeup of the miscellaneous category: The category averages nearly 14 percent of total spending in the Coen dataset (1935-2007).[28] Leonard Nakamura (2005) suggests the category is production costs and commissions, an interpretation we adopt.

Galbi also improved the Coen data for Internet advertising, and he compared the Coen totals with the sometimes overlooked, yet authoritative, data on (1) U.S. business advertising based on business tax deductions[29] and (2) advertising by media based on Census Bureau sources-of-revenue estimates for media industries.

Galbi found that his Internet-adjusted Coen advertising totals averaged 9 percent *less* than totals from the tax data (1996-2007) but drew few conclusions from this finding (or his other comparisons).

b. The IRS (tax) advertising data

The tax data on U.S. advertising are statistics on deductions obtained from business tax filings and reported in the *Statistics of Income* issued by the U.S. Treasury Internal Revenue Services Department (IRS). The data are reported by legal form of organization (corporations, sole proprietors, partnerships), ownership (majority foreign or domestic), industry sector, and size of firm (according to assets).

The IRS considers advertising expenses as promotional expenses *directly* related to business activities (i.e., not lobbying). These expenses can include the cost of institutional or goodwill advertising to keep a business name before the public, from which one can reasonably expect to benefit in the future (i.e., costs of a banner supporting the Red Cross).

As we understand the U.S. tax code, the most compelling reason for Galbi's finding that advertising tax deductions exceed outlays for media/mail is that some expenses are payments to advertising agencies, public relations, or media relations firms, i.e., that the data also reflect the cost of ad development and corporate public relations. And to be clear, deductions for business expenses in the tax data are for purchases only (i.e., they are an indicator of the $P_j^N N_{j,t}^{Purchased}$ term of line 2 in the equation shown in Box 2) and *would not include* the wage and material costs of corporate marketing departments, as such costs are deducted elsewhere in

[28] A special shout-out to Doug Galbi is in order, as he organized the Coen advertising estimates in a publicly available database available at http://www.galbithink.org/cs-ad-dataset.xls (last accessed 1/25/2013), making possible much of the analysis reported in this section.

[29] This statement is in reference to the intangible capital literature. An older strand of the economics literature that studied the impact of advertising sometimes used the tax data. See Grabowski (1976) for a discussion.

business tax returns. Thus, if we wish to use the tax data on business advertising deductions as the basis for promotion expenses, in-house costs still need to be included.

But the tax data *would include* of course purchased services for creating and producing ads by the advertising industry (NAICS 5418), which includes public relations firms as well as ad agencies in the United States.[30] After excluding own and nonprofit use (public use is nil in the United States), revenues of this industry are 20.6 percent of total IRS business deductions for advertising expenses (1998-2008).[31]

Tax data likely also includes purchases of telemarketing services (NAICS 561422), a marketing cost typically not included in media structured datasets. As we shall shortly see, this industry employs about as many workers as the advertising/PR services industry, but its revenues are 1/6 the size.

c. Marketing and marketing research data

As in previous work, the revenues of the industry, marketing research and public opinion polling (NAICS 54191), are used to measure purchased marketing research services. New with this report, an estimate of the revenues of the marketing consulting services industry (NAICS 541613) is used to measure purchased strategic marketing services.

The new estimates are based on the industry's employment share of the broader management consulting services industry (NAICS 54161) for which survey-based revenue data are available from the U.S. Census Bureau from 1985 on.[32] The derived revenue lines up reasonably well with imprecisely estimated Census Bureau data for a more limited range of years (from 2005 on).[33] The BLS data reveal an upward trend in the share of marketing

[30] We refer to industries on the North American Classification System, NAICS, basis rather than an International Standard Industrial Classification, ISIC Rev. 4, basis because the former is much more detailed in its representation of services industries. In this regard, public relations (PR) firms are included with management consultancies in ISIC Rev. 4 as well as in NACE Rev. 2, the system used in the European Union. In the United States, PR agency revenues are about 10 percent of total advertising services (NAICS 5418) revenues.

[31] Estimates of own, nonprofit, and final uses are from BEA's 2002 benchmark input-output table.

[32] Estimates prior to 1998 are based on comparable data from the 1987 SIC system.

[33] Statistics on the sources of revenue (employer firms only) for the management consulting services industry suggest marketing consulting accounts for 11 percent of the total revenue from management consulting services whereas strategic consulting accounts for 27 percent and a category called "all other" accounts for 23 percent (2005 to 2010). The estimated functional components are very imprecisely estimated, however; see Table A-6.9, p. 319, Services Annual Survey 2010, Current Business Reports series, U.S. Census Bureau, in which estimated CVs average as large as 10 and 12 percent for marketing (2005-2010). Distributing the "all other" component evenly across the five functions (marketing, finance, human

consulting employment relative to total management consulting since 1990—from 14 percent in the early 1990s, to 19 percent in the late 2000s, to 20 percent in 2012.

The previously introduced figure 6 (lower panel) shows payroll employment in the marketing consulting services industry (the red line), along with employment in two other detailed advertising and marketing services industries. Data shown are annual averages of the "all employee" monthly counts reported for these industries by the U.S. Bureau of Labor Statistics from 1990 on. The series plotted in light blue, the largest, is an industry whose services are captured in the IRS data (along with telemarketing bureaus, not shown). The two smaller series are industries whose services would *not* be captured in such data.

Although relatively small, the growth in employment in marketing consulting over the period shown is impressive. And in the past five years (2007 to 2012), when U.S. total private employment edged down .6 percent per year (annual rate), employment in marketing consulting services grew 4.2 percent per year. This stands in stark contrast to employment in advertising and related services, which reached a peak in 2000 and dropped 1.2 percent per year since then.

Own-account components for marketing services must of course still be added to purchased services to complete the measurement of these spending series, the subject to which we now turn.

d. Own-account components

The estimation of these components requires detailed analysis of data on compensation and employment by occupation and industry, a subject we studied in related work using data for the United States.[34] Estimation also requires a consensus on which occupations are actively engaged in defining and creating a brand—as distinct from occupations associated with sales.

Table A1 provides a list of 14 specific occupations we use to develop our in-house estimates of investments in brand. The table also indicates industries that are excluded to ensure our estimates represent in-house activity in the business sector, i.e., we consider workers in the *non-media, non-advertising/market research private, for-profit industries only.*

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resources, operations, and IT) and strategy produces a 15.1 percent share for marketing, not too far from the BLS share of 18.9 percent for the same period.

[34] A key aspect of this work was the estimation of annual time series for detailed occupations by relatively detailed industry group. The available official survey data on occupations by detailed industries, the U.S. Occupational Employment Statistics are not consistent annual time series. For more details, see Corrado and Hao (forthcoming).

As may be seen in table A1, one group of occupations used to develop in-house estimates of investments in brand consists of certain managers and analysts—advertising and public relations managers, marketing and public relations managers, as well as market researchers. Another group consists of certain computer, writer/editor, and media occupations. Within this group, the computer-related occupations include web and database developers and administrators, as well as business intelligence analysts and search marketing strategists. The latter two occupations are new emerging occupations identified with marketing activity.[35] Database developers are an important direct marketing occupation according to lists compiled in the *Direct Marketing Statistical Fact Book*, issued annually by the Direct Marketing Association; the occupation appeared on these lists beginning in the late-2000s.

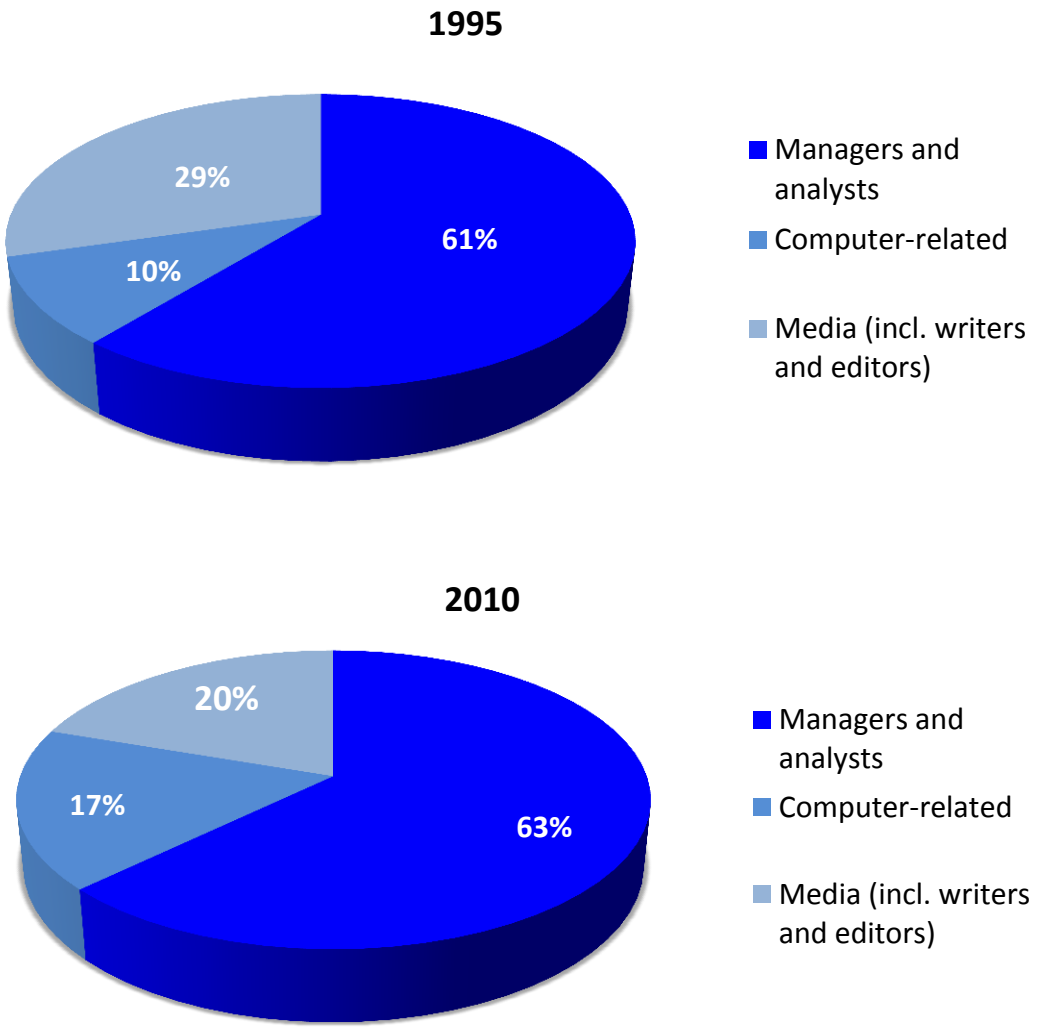
We find that compensation of marketing-related managers and analysts is the largest sub-group among the 14 occupations—at more than 60 percent of the total, both in 1995 as well as 2010 (figure A1). Between those two years, however, the composition of the remainder has shifted notably—toward the computer-related occupations and away from the writer/editor and media-specific ones. All told, compensation of these workers in the for-profit industries not associated with the advertising and marketing services industries is estimated at $101.1 billion (annual average rate) from 2007 to 2011.

To translate these compensation figures to investments on own-account, we need to account for associated support occupations, for the percent of time workers in each occupation devote to branding activities, and for the use of materials and capital services that combine with worker time to produce marketing services. Because we have no direct information on worker time or associated occupations (except of courses sales and telemarketing occupations that we deliberately exclude), in what follows we ignore the issue of associated occupations and simply include 80 percent of marketing manager and analyst time and 50 percent of the marketing-related computer and media worker time as branding activity. Our assumptions for materials and capital shares are patterned after the "miscellaneous professional" industry in the U.S. industry accounts (which includes advertising services, marketing research, and management consultancies). From these accounts we calculate factors that, when multiplied by compensation, yield an estimate of gross output.[36] In the parlance of Box 2, this boils down to setting $\lambda = 2.2$ where $OwnCost^{Indicator}$ = compensation.

[35] The identification of occupations is based on the search relevance score of "marketing" with information in the occupational title, alternative titles, description, tasks, and detailed work activities of occupations in the U.S. Department of Labor Employment and Training Administration's O*NET OnLine as of May 16, 2013.

[36] The "miscellaneous professional" industry is NAICS 5412-5414,5416-5419, and the assumptions are as follows: the materials share of gross output equals .30 and the capital income share of value added equals .35. The latter suggests substantial margins and no need to account for the innovator markup parameter μ (as per equations in Box 2).

Figure A1. Distribution of compensation for marketing and marketing-related occupations in U.S. business, 1995 and 2010



Source. Calculations for this report using prior work by the authors (Corrado and Hao, forthcoming).

e. Putting the pieces together

Table 7 (page 39 of the main text) reports our new spending estimates for brand development in the United States, based on the method of Box 2 and separate pieces of information described above. All figures refer to the four years, 2007 through 2011 (annual average rate).

The first two items on the table (lines 1a and 1b) are the own-account items just discussed. They imply investment on own-account averaged $151.1 billion from 2007 to 2011, a

substantial amount. As previously mentioned, own-account components have not previously been included in U.S. or INTAN-Invest measures of investments in brands. The next two items (lines 2a and 2b) are based on the marketing strategy and marketing research services series discussed in sub-section (c) above. These are much smaller than the own-account components. Note that the entries in column 2 reflect adjustments to the indicator (industry revenues) to bring it conceptually in line with business spending, which for these series involves exclusion of revenues from non-profit organizations.

The last (and largest) individual component of spending and investment on brands is advertising expenses as reported in business tax filings (line 2c) and discussed in sub-section (b) above. The setting and determination of the capitalization factor for this series (column 4) is discussed below. All told then, and as shown on line 4, the new estimates of U.S. business brand spending and investment average 4.0 and 2.4 percent of nominal GDP, respectively, from 2007 to 2011. The estimates suggest that 57 percent of total spending on branding and reputation is long-lived investment, and of the latter, 54 percent is purchased and 46 percent is production on own account.

Long-lived advertising expenses shown in line 2c of table 7 cover both content development and media expenses which underscore that this component is conceptually equivalent to business purchases of advertising services for content development (e.g., from ad agencies) *plus* the costs of "running" an ad campaign in the media. The latter costs are usually termed "advertising spending" or "advertising media spend" in press reports. The relationship between promotion costs measured using tax data vs. independent data on its conceptual components is shown in table A2. The sum using independent data is reasonably close to the tax data. The discrepancy, shown on line 2 of this table is within 7 percent of the tax data (2007 to 2011).

e. Estimating time series

With the available data, we are able to apply the method of table 7 from 1987 on, but it should noted that basic data needed to estimate the largest component of investment (line 2c) are available in IRS/SOI publications back to 1954.

For the 24-year period from 1987 to 2011, we estimate that total nominal investment in brands grew 5.6 percent per year in the United States (0.7 percentage points faster than the growth rate of nominal GDP). Production on own-account grew notably faster than purchased investments (7.0 percent per year vs. 4.7 percent per year), as previously shown in figure 4.

All told, and as was shown in figure 14, U.S. advertising media expenditure does not track investments in brand (as per table 7) very well: the two give sharply divergent signals since the mid-2000s. The addition of strategic marketing costs is the primary source of this difference, especially its own account component. The addition of content development, both on own account and purchased also plays a role.

Before we explain how we arrived at the capitalization factor in table 7 and what we will use as a service life for this investment, we examine the global spending data.

A.2 Global spending measures

Consider first the international data on advertising.

a. WARC advertising data

For this purpose we use data issued by WARC, a privately owned company headquartered in London, which partners with the UK-based Advertising Association to publish the official advertising expenditure series for the United Kingdom. WARC issues data for 83 countries, with figures for many available back to 1981. Like most private sources of advertising data, WARC structures its data by major media type.

In WARC's internationally comparable data, major media types are as follows (alphabetical order): [37]

1. Cinema
2. Internet
3. Magazines
4. Newspapers
5. Outdoor
6. Radio
7. Television

The first point to make is that, in terms of major categories, *direct mail advertising is not included in these international data*.[38] This is a significant omission. According to the Coen structured dataset (1935-2007), the direct mail category averages 18 percent of total spending on advertising in the United States. Put differently, adding direct mail advertising to WARC's estimates of U.S. advertising for the 7 categories listed above increases the overall figure by 32 percent (1981-2007). According to the Direct Marketing Association (DMA), which issues an annual "Fact Book" from which we obtained data on direct mail for 2002, the figures for Germany are revealed to be very high (.60 percent of GDP, compared with .43 percent in the United States for the same year) while for some others the figures are much lower (e.g., Italy's

[37] Another international source is Zenith/Optimedia. According to their website, they use the same 7 categories as WARC.

[38] In its separately issued U.K. data, however, WARC reports information on direct mail advertising. But this is apparently not included in the headline number reported in the press, nor did it appear to be included in the Marrano and Haskel (2006) discussion of U.K. data on advertising. There are no other countries for which data on direct mail advertising have been consistently compiled over time.

direct mail advertising is .16 of GDP in 2002).[39] More recent issues of the DMA Fact Book do not report international figures for spending on direct mail advertising.

The international advertising data also do not include production costs, as they are, like the Coen data, structured by media type. The WARC documentation explicitly states, "Production costs are not included," which of course refers to the costs of creating an ad, e.g., graphic design, developing copy, photography, etc. WARC states that production costs are 7 percent of advertising expenditures in the United Kingdom in recent years (the only country for which it has such information) but concepts are not clear. We note that this is in line with our calculation of compensation costs of design and media workers in business relative to total business advertising costs, but this may be coincidence.

When these major differences—exclusion of direct mail and production costs—are accounted for, and the Coen and WARC's U.S. estimates are compared,[40] the two sets of estimates by media type line up remarkably well except for one category—unfortunately, the largest—namely, television advertising. The Coen data for this category are about 20 percent larger than the WARC data. The reason (or reasons) for the discrepancy can in all likelihood be tracked down, but a dispositive accounting must be left for later work. For now we note the following: WARC's U.S. source for TV advertising is Nielsen whereas the Coen data seem aligned with advertising spending data compiled by Kantar Media (as issued by TVB, the non-profit trade association of America's broadcast TV industry). Both Nielsen and Kantar are respected sources. We note further that the Coen figures for cable TV line up with the Census source-of-revenue data, whereas the Census data for broadcast TV seem more in line with WARC/Nielsen.

What, then, shall we conclude about the available international data and their comparability? First and foremost, the direct mail category needs to be included (or excluded) to obtain internationally comparable concepts. Owing to both its large and variable size across countries, together with the significant role of direct mail in the history of retail advertising (think of the volume of information disseminated via Sears, Roebuck & Co catalogs from 1894 to 1993 in the United States and role of Germany's big catalog houses in spreading information to the "East" after the fall of the Berlin Wall more than 20 years ago), the preferable way to go is to develop internationally comparable time series for direct mail advertising. We attempted this job and found the readily available information too fragmentary and not up-to-date—i.e., a task well outside the scope of this report.

Second, we also noticed certain discrepancies and odd time series for a few countries and believe a valuable next step would be to resolve discrepancies across alternative sources

[39] The DMA 2005 Statistical Fact Book, p. 218.
[40] The comparison accounted for other small differences (e.g., inclusion of yellow pages in the Coen data and implementing a consistent treatment of cinema) too.

(Kantar, WARC, and Zenith/Optimedia). We did a little of this (figures for Spain and Finland are based on Zenith/Optimedia, and all figures for China are from its National Bureau of Statistics) but a more systematic approach is warranted.

b. ESOMAR market research data

We obtained marketing research data from the Global Market Report (GMR) issued by ESOMAR, a company headquartered in Amsterdam and respected source of statistical information in Europe. ESOMAR defines market research as the systematic gathering and interpretation of information about individuals or organizations using the statistical and analytical methods and techniques of the applied sciences to gain insight or support decision-making.

ESOMAR measures revenues of the global market research industry, including the BRIC and selected other emerging countries. The availability of global figures is the primary reason we use this source: GMR figures are available for 80 countries and 10 major industry groups/sectors within each country. The GMR data begin in 1988 and do *not* include an own-account component.

Official market research industry revenue statistics are, of course, increasingly available as countries expand their data collection programs to cover detailed services industries (e.g., the NACE Revision 2 recently introduced in Europe), but internationally comparable official t*ime series* remain very limited. For example, for Europe, figures for France are not available, and for many countries where data are available, figures are for selected recent years only (e.g., 2008). On the other hand, official statistics for the marketing research industry are available for the United Sates from 1985 on.[41] In this report, we make use of the U.S. official time series statistics but otherwise use the data from ESOMAR. A systematic investigation of individual country sources is outside the scope of this report.[42]

The marketing research industry is under dramatic transformation in response to the digital revolution. Online surveys are increasingly more widespread, replacing more expensive phone

[41] Data for the NAICS 54191 (Marketing Research and Public Opinion Polling) industry are available from 1997 on and are linked here with data for the SIC 8732 (Commercial Economic, Sociological and Educational Research) industry back to 1985 to obtain a continuous time series. The link is based on the 1997 SIC-to-NAICS-bridge developed by the Census Bureau.

[42] Although we cannot say how ESOMAR's figures generally line up with official sources across the globe, we note that ESOMAR's figures for the Untied States are substantially lower (55 percent from 2003 to 2007) than the official statistics issued by the U.S. Census Bureau. We checked to see if the Census Bureau's data are larger because they include significant secondary services, but according to the 2007 Census, 95 percent of the revenue of NAICS 54191 is from marketing research services. Opinion polling accounts for about 3 percent of total ESOMAR-estimated spending on marketing research.

and face-to-face interviews, for example. And companies not in the market research business, such as Google, Apple, and Facebook, are now generating insightful marketing research from information generated by online data gathering techniques.

ESOMAR's GMR produces a conservative estimate of market research spending, in that GMR measures traditional marketing research activities and does not necessarily capture newer activities associated with the Internet. ESOMAR commissioned a study to compare revenues of the thirteen traditional market research activities covered in their GMR measures with revenues generated by seven additional types of activities, some associated with the Internet.[43]

ESOMAR found that the broader set of activities generated revenues that were 60 to 70 percent larger than GMR revenues in the United States and United Kingdom, and 20 percent larger in Argentina. All told, this suggests the marketing research industry is undergoing structural change. But note further that the U.S. Census Bureau's estimates of revenues from marketing research activity are within 5 percent of ESOMAR's broader estimates (i.e., closer than they are to ESOMAR's traditional estimates).

A.3 Brand investment and capital

We now review the details behind the determination of the results summarized in section 3.4 of the main report.

Before we delve into those details, first note that relative to earlier work, "advertising" is now broader in concept and larger (by about 1/3) because promotional spending is included and more rigorous techniques have been used to estimate own-account costs. A second prefatory point with regard to earlier work is that CHS exploited the national/local breakdown in the Coen data to determine the capitalization of advertising—a breakdown that is no longer readily available. The national component of total advertising is 60 percent of total spending on advertising. The other commonly used baseline is to subtract classified ads, and consider what of the remainder is investment; in work on the UK a fraction of 80 percent was used.

The basis of the national/local distinction suggested by CHS was grounded in a reading of results in the literature on the depreciation of product branding—namely, the fraction of such

[43] The thirteen traditional activities are: (1) market measurement, (2) media audience/research, (3) stakeholder measurement, incl. CRM, (4) new product/service development, (5) advertising/brand tracking, (6) usage & attitude studies, (7) market modeling, (8) advertising pre-testing, (9) opinion research/polling, (10) other qualitative studies, (11) other business to business studies, (12) other omnibus/shared cost survey, and (13) other.

The seven additional activities are: (1) marketing reports & research, (2) media monitoring, (3) sample and panel providers, (4) web traffic measurement, (5) social media communities, (6) survey software, and (7) IT and telecom measurement research.

spending that did not meet the criteria for capitalization because effects did not last materially longer than one year. A problem with this reading is that the role of corporate branding (related but not identical to product branding; see the inset box on page 8) was not considered. According to practitioners, such as Jim Gregory, CEO of Corebrand and author of 4 books on corporate branding and its connection to market capitalization, the revenue-generating capacity of corporate brands is more long-lived than that of product brands. This point seems somehow obvious when thinking about innovative firms whose product lines (or product platforms) change and evolve over time,[44] but it is a distinction that has not permeated the economics literature on the durability of advertising.

The available economics literature is of course quite dated, and to our knowledge, nothing new and/or useful has been added for many years. We thus proceed as follows: We first point out that the .6 factor CHS used stemmed, at least in part, from a look at the industry distribution of results with retail industries and local services showing very low or zero implied capitalization rates whereas industries with nationally marketed products showing much higher implied rates (CHS 2005, p. 32). Second, a literal read of the precise results used (Landes and Rosenfield 1984, p. 270, table 2, last column) supports capitalization rates ranging from .2 to .9, results that, taken alone, provide little guidance.[45]

Third, because our spending estimates are now higher and have a different mix (more content creation, more promotion spending), the 60/40 split based on national vs. local media dissemination shares is less likely to apply.

Fourth, there are *two* sets of results in the Landes and Rosenfield article (hereafter LR), one that controls for firm-level fixed effects on estimates of advertising durability and another that does not. The first set was used in the CHS analysis. Because the data LR used are for a limited number of years (4 years for about 400 firms), it is not unreasonable to assume that the corporate brand is captured as a fixed effect in the LR regressions with firm-level fixed effects (LR say they are holding constant product quality). Thus, the LR results with firm-level fixed effects may tell us something about the longevity of specific product ad campaigns, holding corporate brand constant. This is not quite what we want; we rather wish to have the net effect of the two, as the efficacy of product branding is generally speculated to be higher when corporate brand is stronger, and we want the longevity of corporate brand to be included in the overall longevity estimate.

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[44] For instance, consumers tend to associate the name 3M with smart innovation because of its Post-it products, and thus when they hear that 3M has come up with a new product, a hook, say, that sticks to a wall and can be removed without leaving a trace, they rush out to try it. Would they do that in the same numbers for an unbranded product?

[45] Referring back to footnote 12, setting $T = 1$ as the cutoff for capitalization and using advertising as weights for the results reported in the table, then $d = 1.5$ yields a capitalization factor of .9, whereas $d = 1.67$ yields a factor of .5, and $d = 2$ gives .12.

The corporate and product brand complementarities cannot surface when firm-level fixed effects are used, but just dropping these terms is not what we want either. Without additional controls, estimates of the durability of branding will be confounded by other firm-specific factors such as production efficiency, the profile of employees, etc. To better understand this dilemma, consider the hotel industry. This is an industry where one might think that reputation and a strong corporate brand are essential to success—competencies that are built over many years via strategic marketing, consistent management, and operational excellence (the "alignment" discussed by Gregory in the inset box on page 8). When firm-level fixed effects are used in LR-style regressions to estimate the lifetime of advertising in this industry, the estimated marginal impact of *any* factor correlated with corporate brand—such as advertising—will be biased toward zero. Without fixed effects, the estimated marginal impacts are biased in the opposite direction (up), with the degree of bias depending on the strength of the correlation between advertising and the omitted factors.

All that said, a literal read of LR estimates *without* firm-level fixed effects (column 3 of the previously referenced table in their article) suggests a capitalization factor of one and a depreciation rate (advertising-weighted) of 12 percent. As per the previous paragraph, this is an *over*statement of the durability of advertising because it is confounded with other effects that positively impact firm performance. A literal read of the LR estimates *with* firm-level fixed effects and assuming a capitalization rate of .5, is a depreciation rate of 51 percent. And, as per the previous paragraph, this is an *under*statement to the extent that corporate brands interact with the effectiveness of spending on advertising. Reality is somewhere in between—and of course to even believe that, one must grant that results based on the competitive environment in the United States 25+ years ago are still meaningful in today's globalized economies. Clearly, more work on this topic is warranted.

Because the extant literature is so uncertain, we rely on the UK Intangible Asset Survey (IAS) for guidance. Ignoring the issue of the omission of direct mail in the data on UK advertising and taking into account the IAS reports a substantial own-account component, we are able to align the results of the survey with the UK macro estimates based on advertising data by adopting a capitalization factor of .5 (and the discussion above and footnote 42 suggests that is not an unreasonable value for the capitalization factor). Then if the life length of investment in brand and reputation is set to be one year longer than the literal results of the IAS to account for gestation of the investment component (recall the discussion in section 1.2), then a geometric depreciation rate of 44 percent is implied (as per footnote 9, .44=1.67/3.8).

Table A1. Occupations Used for Business In-House Marketing Cost Estimates

Occupation Titles	*Standard Occupation Code (SOC)*
Managers and analysts	
1. Advertising and Promotions Managers	11-2011
2. Marketing Managers	11-2021
3. Public Relations Managers	11-2031
4. Market and Survey Research Analysts	19-3020
Computer-related	
5. Web Developers	15-1034[1]
6. Database Administrators	15-1061
7. Web Administrators	15-1199.03[2]
8. Database Architects	15-1199.06[2]
9. Business Intelligence Analysts	15-1199.08[2]
10. Search Marketing Strategists	15-1199.10[2]
Media, incl. writers and editors and telemarketers	
11. Public Relations Specialists	27-3031
12. Writers and Editors	27-3040[3]
13. Media and Communications Workers, all other	27-3099
14. Media and Communication Equipment Workers	27-4000[3]

Notes. All codes are 2000 SOC codes unless noted otherwise. To obtain estimates for *business in-house* marketing costs, tabulations are restricted to private industries *excluding* nonprofit and media, advertising, marketing research industries (i.e., excluding NAICS 512, 515, 5418, 5419, 61, 622, 623, 624, 711, 712 and 813).

1. 15-1034 is a 2010 SOC code. Prior to 2011, the subcategory is estimated as one-fifth of the 2000 SOC code 15-1081 (Network Systems and Data Communications Analysts).

2. O*Net elaborates 12 detailed categories for the 2010 SOC code 15-1199, Computer Occupations, All Other, four of which are the database and marketing activities listed in the table. Prior to the availability of data for 15-1199, the category is represented using 100 percent of 15-1099, Computer Specialists, All Other (a 2000 SOC category). Because no employment or wage data are available for O*Net detailed categories, one-third of the total estimate of 15-1199 is used to represent the computer-related marketing occupations.

3. List of detailed subgroups not shown.

Table A2. U.S. Content Development and Media Services: Independent estimates, 2007-2011 (billions $, annual rate)					
Type	**Indicator (1)**	**λ (2)**	**Business Spending (3)**	**g (4)**	**Business Investment (5)**
1. Long-lived advertising services from table 7	**Tax deductions, all businesses[1]**	**--**	**316.7**	**.5**	**158.3**
Independent series:					
a. Advertising and PR services	Revenue, NAICS 5418	.88	83.4	.5	41.7
b. Telemarketing services	Revenue, NAICS 561422	.97	13.7	.5	6.9
c. Media services	Coen/Galbi[2]	.94	198.6	.5	99.3
2. Discrepancy (= 1 - 1a - 1b – 1c)			**21.0**	--	**10.5**

Source: Authors' elaboration of data from previous works and numerous sources. Method is elaborated in Box 2, based on domestic business activity only. Components are independently rounded.

1. Corporations, sole proprietorships, and partnerships. Data for the latter are estimates based on business receipts.

2. Coen/Galbi total spending less miscellaneous category less ½ classified advertising from NAA and IAB/PWC. Extrapolated from 2007 using data from WARC.