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Measuring design investment in firms: Conceptual foundations and exploratory UK survey

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ABSTRACT

The importance of design to company and national performance has been widely discussed, with a number of studies investigating the value or impact of design on performance. However, none of these studies has measured design investment as an input against which performance can be compared. As yet, there is no established way in which design investment might be measured. Without such a method, we cannot develop a reliable picture, akin to that for R&D spending, on the impact of design spending on company performance.

This paper presents a conceptual framework for the measurement of design investment and applies this framework in a survey of UK firms. The framework describes design as being part of the creation and commercialization of new products and services. The survey highlights some surprising patterns of design spend in the reported sample and demonstrates the viability of the underpinning framework. A revised framework is proposed that situates design investment in the context of R&D. The model has implications for policy makers trying to understand the role and scale of design in the private sector, for managers wishing to optimize their design investments and for academics seeking to measure the value of design.

1. Introduction

Over the past thirty years there has been a broad discussion on how to account for intangibles at the company and national level, both in accounting terms and in models of growth, as a key factor in the innovation process (Corrado et al., 2009). Work in this area started with items such as advertising and then moved to include measures of research and development (R&D) (Hirschey, 1982). This reflects ongoing changes in leading economies where knowledge has become progressively more important than labour for many commentators. These changes are especially important for countries such as the United Kingdom (UK) where recent estimates suggest that investment in intangibles as a percentage of GDP is higher than that for tangibles (van Ark et al., 2009).

However, "Both firm-level and national income accounting practice have historically treated expenditure on intangible inputs . . . as an intermediate expense and not as an investment that is part of GDP" (Corrado et al., 2009). This exclusion obscures the role that many of these intangibles may play in innovation and in growth. Unfortunately data for intangibles is in many cases not available. As van Ark et al. (2009) commented "Since this is a relatively new research field, statistical offices and other agencies often do not have comprehensive data on various intangible assets, and research is still scarce in most areas."

This paper focuses on ***design*** as an intangible asset which is a potentially under-represented source of long term growth. The strategic importance of design, however defined, has been commented on increasingly over the past decade (Borja de Mozota, 2002; Stevens and Moultrie, 2008). It has also been recognized that the work to date on Research and Development (R&D), while important, does not capture all of the investment that is related to product and process innovation (Galindo-Rueda et al., 2010). Taking a broad interpretation of design, spanning from technical design to brand and identity design, we aim to define more precisely how design might be measured as an intangible investment at the company level, offering the longer term potential of understanding the impact of this investment on growth. This is not to say that other measures of design performance are not important, but that *investment* as a specific measure has not been previously defined, as will be discussed in Section 1.2.

There is currently no agreed measure of design investment or a dataset of such spending. A number of large scale efforts have begun to improve the measurement of investment in innovation (e.g. Haskel et al., 2009) and a smaller number of studies

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have begun to include design, attempting to assess how significant investment in design is (Galindo-Rueda et al., 2010). These studies use existing datasets, such as the Labour Force Survey for the UK, and work through Standard Industrial Classification Codes and Standard Occupational Classifications to extract the design element of reported Figures. Whilst these approaches offer useful insights and good approximations, by necessity it means that such studies must adapt their conceptual understanding of design to fit with these existing data sources and data structures.

The approach taken in this paper is first to develop de novo a conceptual framework by which design investment might be measured, and then apply this framework in an exploratory survey of UK firms. The paper concludes with a revised framework for the measurement of design investment and a discussion on how this new framework relates to the measurement of R&D as described in the Frascati Manual (OECD, 2002).

1.1. A comparison with measuring investment in Research and Development

In the late 1980s, the House of Lords Select Committee for Science and Technology (HOL, 1987) reported to the UK government on Research and Development (R&D). They argued that investment in R&D was insufficient and resources should be focused on improving the situation. Their conclusion was that "*as a nation, we are investing too little in R&D and the situation is getting worse*" (HOL, 1987). As a result, attention was given to the financial reporting of R&D expenditure and in the late 1980s, standard accounting procedure SSAP13 was created (Accounting Standards Committee, 1989). Other similar standards were created internationally, all based on definitions established in the Frascati Manual (OECD, 2002), initially created in 1963. The Frascati manual provides guidance on measurement of R&D inputs, and "deals exclusively with the measurement of human and financial resources devoted to R&D."

Whilst the standards on capturing R&D spend are now well established, this was not always the case. Early attempts to measure R&D were hindered by its perception as being too "creative and unstructured" to be measured (Kerssens-van-Drongelen and Cooke, 1997; Nixon, 1999). Thus, standard management and control techniques were considered inappropriate (Roussel et al., 1991). These issues were overcome because there was sufficient recognition of R&D's importance to commit effort to develop a means of measuring it.

In providing the conceptual foundations by which R&D investment might be measured, there was no attempt to qualify whether this investment was 'good' investment. Indeed, it is only relatively recently that questions have begun to be asked about how the investment is used, not just how much is spent. These new questions are enabled by the earlier work done in conceptualizing and capturing data on how much is invested.

Design is arguably even more 'creative and unstructured' than R&D and there is also growing recognition of the need for design investment to be better understood:

> "It is vital that the financing of design activities, particularly product design, is written into corporate, business and operating plans. The achievement of excellence in design requires funds to be allocated from clearly identified budgets well in advance, to cover properly programmed requirements." (BSI 2002 – BS7000 Pt. 2, p. 9)

1.2. Previous work on the value or impact of design

A number of landmark studies have provided different perspectives on the importance of design for a company. Taken together they provide persuasive evidence that there is a key role for design in creating and sustaining competitiveness. A brief summary of some of the key works is provided below.

Black and Baker (1987) examined 'design orientation' in around 60 small engineering firms, using 'company growth rate' as a measure of success. However, they avoided any explicit measure of design investment. They claimed that "... successful companies have greater design involvement through the new product development process ..." and that such companies "... are more aware of design as a source of competitive advantage."

Walsh et al. (1992) identified a generally positive relationship between design "consciousness" and success in firms, again, avoiding any measures of design input. In their report on the benefits of the Funded Consultancy Scheme, Roy and Potter (1993) state that prior to their work "... there was no information available on the benefits, costs and risks of specific investments in design and product development at the product or project level."

Gemser and Leenders (2001) explored the competitiveness of Dutch manufacturing firms that invest in industrial design in comparison with those that do not. This study found a correlation between industrial design intensity and performance, where industrial design intensity is a multiple-item scale based on percentage of new product development (NPD) projects in which professional design expertise was used and number of design awards won.

Hertenstein et al. (2001) also set out to establish the "value of design" in study of 51 companies across 4 sectors. In this case, design orientation was judged by an external expert and this was compared against measures of (business) financial performance. The analysis compared two groups, those judged to have more-effective design and those judged to have less effective design, according to the design experts. Results indicated that effective design is associated with better financial performance. More recently, a similar study found that firms with 'high design effectiveness' are better performing in terms of growth and financial performance (Hertenstein et al., 2005). Again though, both studies utilized indirect or subjective measure of design effectiveness.

Chiva and Algere (2009) set out to measure the link between *investment* in design and firm performance. But, the authors specifically commented that "owing to the difficulties in obtaining design investment data or average expenditure on design during new product development projects ... a self reported approach ... was used." They provided a Likert scale against which respondents scored whether design investment had increased or decreased in the last three years. A similar approach was previously used by Dickson et al. (2003). It is also useful to note that Chiva and Algere (2009) do not provide any specific definition for design against which the increase/decrease in investment is judged and that design is situated solely within product development. Thus, in setting out to understand the impact of design investment, they concluded that there was currently no viable means by which this critical construct can be measured.

All of these studies use measures of activity, capability or reputation in order to demonstrate the value of design. In a landmark study, Sentance and Clark (1997) conducted a survey of around 800 manufacturing firms, representing approximately a fifth of the UK's manufacturing industries. Their survey intended to enable the estimation of expenditure on design at a national level. They noted at the time that "the main element of design activity is product design that takes place within companies." This reflects their focus in manufacturing, as opposed to other sectors of the UK economy. They formed a categorization of design based essentially around the design professions: market research; product development and improvement; appearance design; technical design; process/systems design; engineering design; and graphic and brand design. They estimated that UK manufacturers invested around £10bn on product development and design, in contrast to £7bn spent on R&D during the same year. However, the relationship