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This working paper is submitted by:

Finbarr Livesey* and James Moultrie**

Institute of Manufacturing,
University of Cambridge

*Email: tfl20@eng.cam.ac.uk (corresponding author)

**Email: jm329@eng.cam.ac.uk

*Do trademarks and design registrations provide
a better perspective on national innovation
activity?*

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The Intellectual Property Rights (IPR) elements of the DIME Network currently focus on research in the area of patents, copyrights and related rights. DIME's IPR research is at the forefront as it addresses and debates current political and controversial IPR issues that affect businesses, nations and societies today. These issues challenge state of the art thinking and the existing analytical frameworks that dominate theoretical IPR literature in the fields of economics, management, politics, law and regulation- theory.

Do trademarks and design registrations provide a better perspective on national innovation activity?

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Finbarr Livesey ^A and James Moultrie ^B

A:

Corresponding author

Institute for Manufacturing

University of Cambridge

Mill Lane

Cambridge CB2 1RX

tfl20@eng.cam.ac.uk

B:

Institute for Manufacturing

University of Cambridge

Mill Lane

Cambridge CB2 1RX

jm329@eng.cam.ac.uk

Abstract

When discussing intellectual property performance, patents usually dominate (Tether, 2007). The modes of protection more likely to be used in the creative industries, trademark and design registrations, are under studied and under reported (Schmoch, 2003, Mendonca, 2004). This may lead to a misunderstanding of the innovation impact of the creative industries, due to a bias in the indicators used, and also may be under representing indicators which may be closer to market indicators of innovation activity.

This study explores published evidence on patents, trademarks and design registrations over the period 1998 to 2002. There are significant contrasts between the relative levels of usage of all forms of intellectual property country-to-country, and notably, China is increasing its use of all forms over the period studied. Furthermore, evidence from the UK Community Innovation Survey indicates that trademarks may be a better discriminator between innovating and non-innovating firms. Finally, findings indicate that both design registrations and trademarks may be useful innovation indicators due to their closeness to market, accessibility and timeliness.

1. Introduction

The perceived importance of innovation as a policy area is reflected in the prominence of the Lisbon Agenda and the incredible number of articles written on innovation and its impact on growth over the past decades¹ (Fagerberg, 2005). Innovation is seen as key to continued growth and prosperity through its contribution to economic productivity and national competitiveness (Moris et al, 2008). At the same time, the transition to the “knowledge economy” or the “new economy” for leading economies has been much discussed, although the terms and definitions have varied significantly (for example see the contrast between OECD reports on the New Economy (2001) and the Cox Review (Cox, 2007)). Bringing these two issues together in order to be able to define, measure and support innovation in the new economy is a continuing challenge.

Given the importance of the innovation activity it is not surprising that significant effort has already been expended in trying to understand how to measure innovation efforts and outcomes across countries. Efforts to define and standardise approaches to measuring innovation are most clearly expressed in the Frascati Manual (OECD, 2002), which is directed towards understanding research and development (R&D) expenditure, and the Oslo Manual (OECD, 2005), which provides guidelines for collecting and interpreting innovation data. It has taken a number of decades for agreement to be reached on how to define specific elements of the innovation process (for example R&D) and this paper does not wish to take issue with the core pieces of that work. Rather we wish to investigate whether the necessary focus to develop clear input measures has led to a lack of investigation of other measures which may be closer to market and hence closer to the moment of innovation – when a new product or service enters the market. Specifically, we ask whether the ‘other’ formal methods of intellectual property protection, meaning design registrations and trademarks as opposed to patents, can provide a better perspective on national

¹ A simple Google Scholar search on innovation returns over 3 million hits, while a search for innovation policy returns approximately 1.5 million pages.

innovation activity. By 'better perspective' we mean whether these indicators give a clearer immediate representation of innovation intensity, rather than being useful as indicators of what may be working well or failing in the innovation system. This division between the study of innovation and the analysis of innovation for policy appears pronounced and is the starting point for this paper. Much work on innovation complexity is not being brought into policy analysis.

Section 2 of the paper provides an overview of the literature on the importance of trademarks and design registrations to the innovation process as well as the inclusion or not of these forms of IP protection in innovation indicators. The next section provides data and comments on the relative use of each form of intellectual property protection for different sectors in the UK, and investigates patterns of intellectual property protection to ascertain the relative strengths and weakness of a set of countries in regard to trademark and design registrations. Section 4 discusses the characteristics of each method of formal intellectual property protection in terms of innovation to develop the argument for why design registrations and trademarks may provide us with a new perspective. Finally, section 5 provides a discussion on where research and policy may benefit from a clear focus on all formal IP methods, especially as efforts are underway in both the USA and the UK to develop new metrics and scorecards for innovation.

2. Innovation, design registrations and trademarks

The measurement of innovation has a long and distinguished history, with significant advances made over the past twenty to thirty years as different types and forms of innovation have been recognised and the systemic nature of innovation emphasised (Godin, 2002). For example, the move towards open innovation has led to a great focus on collaborations between firms rather than measuring innovation as occurring within a single firm. The national innovation system approach, which appears to underpin much of the more complex discussion on innovation measurement, is now broadly used across countries (Lundvall, 2007). However, do the analyses and discussions on measurement of innovation include design registrations and trademarks as indicators? How is the relationship between these forms of formal intellectual property rights and innovation understood? This section reviews the available literature on these issues and discusses what may be shortcomings in many approaches to innovation measurement to date.

2.1 Design registrations, trademarks and innovation

The link between innovation and productivity (and economic growth) has been discussed many times and is well established in UK policy (DTI, 2006). The UK government's model of growth is based on five drivers, one of which is innovation². However, the interpretation of various innovation activities and their importance to overall innovation outcomes, and therefore growth, can be relatively narrow. Research and development (R&D) is the core focus of most of these discussions and therefore attempts at measuring innovation performance, either at the level of the firm or the country, tend to cluster around the input measure of R&D spend and the output of patents. A clear example is the background to work by Porter on the National Innovative Capacity Index discussed in the 2001 Global Competitiveness Report (WEF, 2001) in the paper entitled "The determinants of national innovative capacity" (Furman et al, 2002). The first sentence of the abstract outlines the focus of the paper as "... an empirical examination of the determinants of country-level

² The others being investment in physical capital, skills, enterprise and competition.

production of international patents.” Within the paper national innovative capacity is defined as a “... country’s potential ... to produce a stream of commercially relevant innovations.” This is measured by “... the level of international patenting ...” which shows an immediate bias in terms of what innovation is and how it can be measured.

The other two forms of formal IP protection, design registrations and trademarks, do not receive much attention. A design registration for an industrial design is “... the ornamental or aesthetic aspect of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color” (WIPO, 2008). Essentially, this allows you to protect the appearance of the whole or part of a product.

Design has been identified as an important way of adding value to products and services and improving competitiveness (eg. Rothwell and Gardiner, 1982). Some consider it to be an important driver of innovation, acting as a bridge between technical and customer oriented functions (eg. Kline and Rosenberg, 1986, Rothwell, 1992, Walsh, 1996). Design has also been seen as a means of communicating with customers through products (Verganti, 2003). There have been a number of independent studies that provide only limited quantitative evidence of the benefits of design (e.g. Sentance & Clark 1997, Hertenstein et al 2005, Gemser and Leenders 2001).

Trademarks provide “... a distinctive sign which identifies certain goods or services as those produced or provided by a specific person or enterprise ...” (WIPO, 2008) and are seen as the “... poor relation of the intellectual property world, not really ‘intellectual’ at all” (Barnes, 2006). According to Barnes (2006) this is due to a lack of foundation in public-goods theory for trademarks, in contrast again to patents. A trademark is regarded as a private-good, as public-goods are non-rivalrous and the use of a mark by one enterprise blocks others from using it. However, Barnes (2006) argues that there is a market failure in the supply of trademarks and the information that they provide to customers. Essentially, the non-rivalrous use of the information

contained in a brand or a sign has a public-good aspect and therefore the use of the mark in information terms makes it a mixed-good at least.

There is little comment in mainstream economics on trademarks and their value to companies and countries (Mendonca et. al., 2004). The earliest paper dealing explicitly with the economics of trademarks appears to be that by Economides (1998). He describes the economic reason for trademark protection as facilitating consumer decisions when experience-goods have unobservable differences, and that such protection encourages companies to produce goods with desirable qualities even when they are unobservable. The approach is very traditional and does not discuss the role of trademarks in assisting the introduction of a new product to market, the true moment of innovation. The linkage between the law of trademark and economics is discussed by Landes and Posner (1987), providing an underpinning for the existing law of trademark in the United States. There is no mention of innovation in their examination of the economics of trademarks.

2.2 Design registrations and trademarks as indicators of innovation

As noted above, the link between R&D and innovation, and the proxy for R&D measurement patenting, is widely discussed and analysed. However, the use of both design registrations and trademarks as innovation indicators is not widely discussed in the literature. This may not be surprising given the lack of discussion regarding the economics of both forms of protection. There is a small group of notable exceptions which are discussed below, but it should be emphasised that this literature is sparse in contrast to the broad and deep literature on the link between patenting and innovation (with patenting as a proxy indicator for R&D activity).

The formal IP rights that we are discussing, design registrations and trademarks, do not feature explicitly in the Frascati Manual. There is a significant discussion on activities that are on the borderline of R&D and how to include or exclude items such as Industrial design (section 2.2.2). However in terms of metrics or indicators both are mentioned in terms of “technology balance of payments” as part of other science and technology indicators in annex 7 (OECD, 2002). Beyond this, unsurprisingly given

its definition as a proposed standard for surveys on research and experimental development, there is no place for design registrations and trademarks in the Frascati Manual.

In comparison the Oslo Manual (OECD, 2005) recommends the collection of data on formal methods of IP protection including design registrations and trademarks as “Data on which types of methods are used and their relative importance can help inform policies to maximise the economic and social benefits from intellectual property rights.” This is reflected in the current structure of the Community Innovation Survey (CIS) which includes this question. Data on IP protection methods being used by UK companies are discussed below.

Schmoch (2003) investigates trademarks (or service marks) as novel indicators for services based on survey data for German firms from 2001. He first asks what criteria should be applied to an indicator to decide whether it is good or not for innovation measurement. The criteria include:

- Correlation between innovation and trademarks
- Ease of access to trademark statistics
- Possible to compare countries

Unfortunately the list of criteria is not justified in the article and whether these are the best criteria for choosing innovation indicators is open to question.

The correlation of use of trademarks to innovation was based on share of turnover from new products and services and for services it was seen to be significant. However, patents were more significant for manufacturing firms and given their more detailed structure, Schmoch contends that patents are the preferred indicator for manufacturing. The non-applicability of patents in knowledge intensive services and the correlation of innovation to trademarks for such services, appears to support the argument for trademarks as an indicator of innovation in this sector.

Making similar arguments on the validity of trademarks as innovation indicators Mendonca et al (2004) provide some data on the use of Community Trademarks and investigate the case of Portugal in detail. They argue that trademarks are complementary to other innovation indicators as they appear to do well in sectors in which patenting is weak. This mirrors the arguments in Schmoch (2003) and appears to be the key rationale to date for the inclusion of such intellectual property methods as innovation metrics.

There are a number of innovation indices in existence which are used to make macro judgements on whole economy innovation performance and to carry out national comparisons. However, measuring innovation is difficult. “No single innovation indicator gives a comprehensive picture of performance so it is important to look across a range of indicators” (DTI, 2003). Most composite indicator approaches are based on the concept of a national innovation system (Lundvall, 2007). In a report to the UK’s Design Council, Livesey et al (2006) simplified the innovation system into the enabling environment, inputs, outputs and outcomes. Then, instead of having to depend on one innovation indicator, there are multiple indicators grouped according to whether they are inputs to the system, outputs from the system or outcomes of the system, as illustrated in figure 1. In this approach patents, design registrations and trademarks are all considered as outputs of the innovation system.

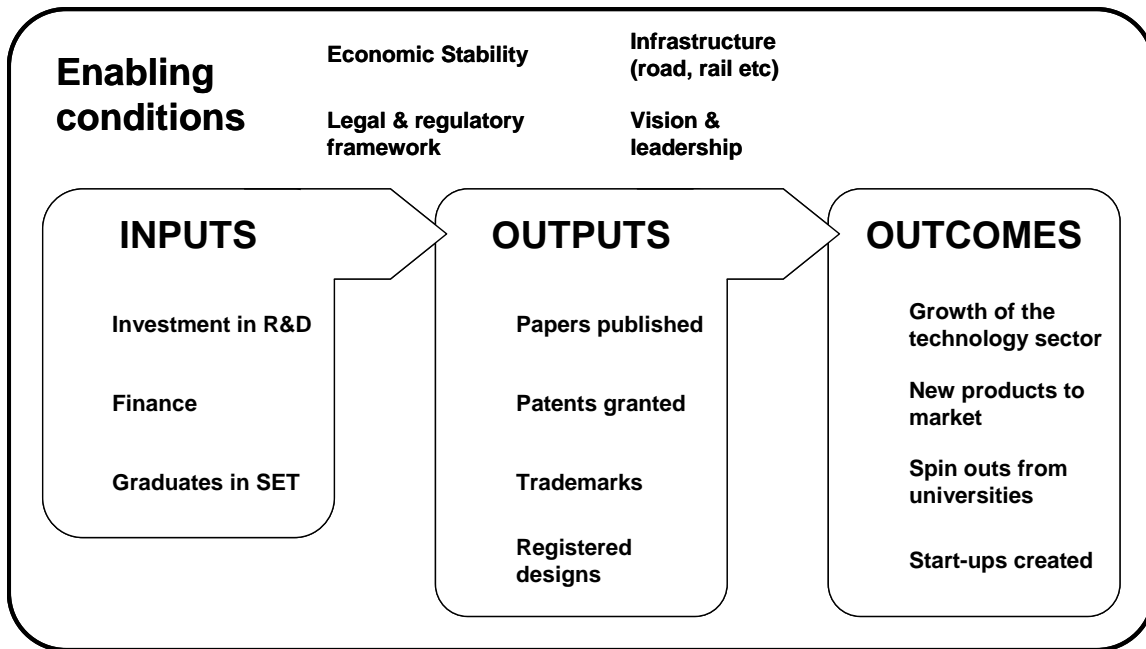


Figure 1 – simplified national innovation system

This splitting of indicators into such categories has appeared in many formats in the literature, for example Cooper and Merrill (1997) give the following definition – “The term ‘inputs to innovation’ generally refers to the resources committed to innovation, including the investment in R&D and intellectual capital. ‘Innovation output’ refers to the new products and processes produced. Finally, there is the ‘outcome’ or impact of innovation on the firm, economy and society.”

Based on the data collected for the European Innovation Scoreboard, the Summary Innovation Index (SII) provides an overview of national innovation performance.³ 25 indicators are included, scaled against the EU average and normalised against the upper and lower values. The overall SII score is the average of these normalised scores. Community design registrations and community trademarks are included as two of the twenty five indicators. However, patents are represented by three separate indicators covering European patents, US patents and triadic patents.

³ Details of the SII and the EIS can be found online at <http://www.proinno-europe.eu/>.

Other approaches, such as the National Innovative Capacity Index discussed above, use a narrower set of indicators and tend to focus on the input side of the innovation process and on technical change. In these approaches the only indicators that appear to matter are research and development (R&D) spending (as a percentage of GDP or as a percentage of sales) and the number of patents applied for and granted. The role or importance of other intellectual property indicators, such as design registrations and trademarks, seems to be disregarded.

3. Use of trademarks and design registrations

In order to address the issue of whether design registrations and trademarks are useful and possibly better indicators of innovation than patenting or spending on R&D we need to investigate their levels of usage. This section provides an overview of data available from the most recent Community Innovation Survey (CIS) for the UK on IP importance for companies, as well as discussing levels of usage of formal IP at the national level with a particular focus on WIPO design registrations and trademarks.

3.1 UK company usage of formal IP protection

To discuss whether design registrations and trademarks are useful indicators of innovation we must look at the patterns of formal IPR usage in companies and whether there are any differences between companies who are innovators and those who are not. The most recent Community Innovation Survey (CIS4) for the United Kingdom collected data on innovation activity and asked whether companies consider various approaches to protection to be important. The types of protection included were formal protection (design registrations, trademarks, patents, confidentiality agreements, and copyright) as well as informal methods of protection (secrecy, complexity of design and lead-time advantage).⁴ Using this data for the United Kingdom we can see what the level of importance (as a proxy for usage⁵) of the three formal methods of interest to this paper (patents, design registrations and trademarks) were and see if there is a difference for innovating companies.⁶

⁴ The full questionnaire for the UK version of CIS4 is available online at

<http://www.berr.gov.uk/dius/innovation/innovation-statistics/cis/cis4-gst/page11578.html>.

⁵ The phrasing of the question in the CIS is interesting. “For the three year period 2002 – 2004, please indicate the importance to your enterprise of each of the following methods to protect innovations.” Rather than asking for direct usage the question appears to be trying to assess IP protection specifically for innovation. This is the reason why we consider this to be a proxy for use in innovation throughout the rest of this paper.

⁶ Within the CIS questionnaire companies self reported whether they had introduced a new or significantly improved product, service or process.

The overall level across the whole sample (innovators and non-innovators) of formal IP protection importance appears to be low, with 16% of companies indicating patents were important compared to 16% for design registrations and 21% for trademarks in the 2002 to 2004 period.

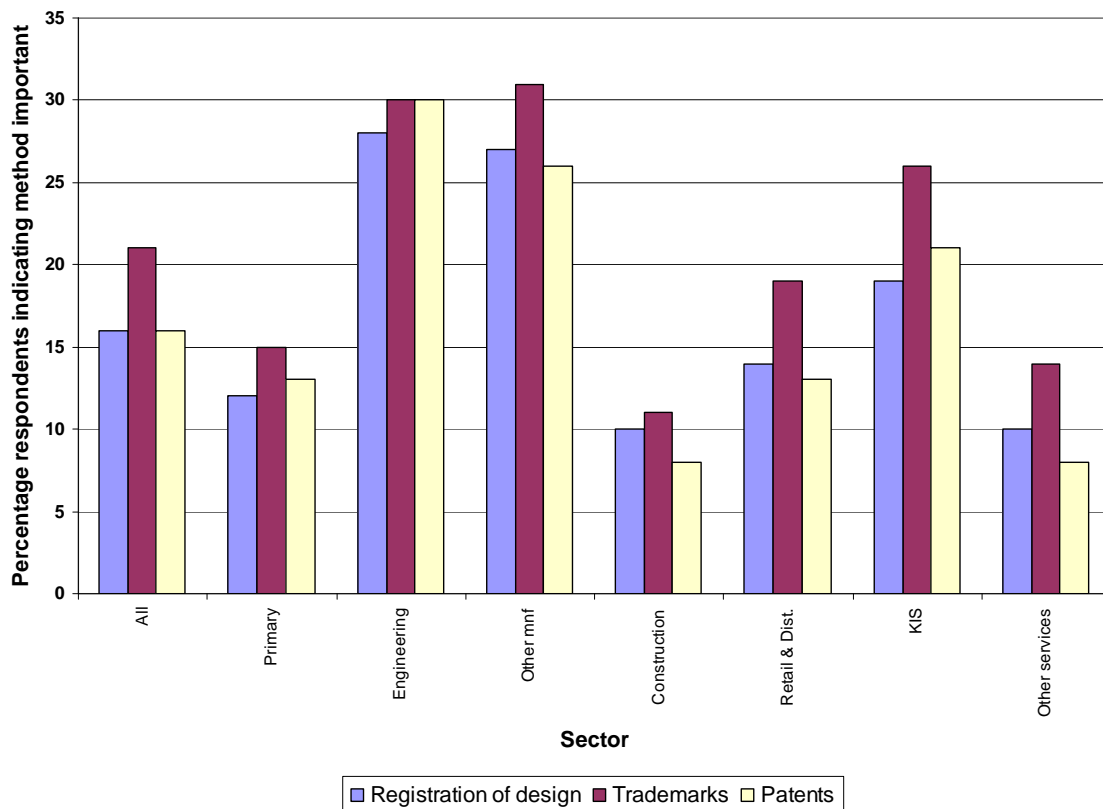


Figure 2 – UK companies use of formal IPR methods 2002 – 2004 (DTI, 2006)

This obviously varies significantly by sector, and Table 1 shows the lowest and highest importance of each protection method by sector grouping.⁷ It might be expected that service based sectors would use more trademarks and that appears to be the case. However, it might also be expected that services would have relatively

⁷ The sector groupings are based on groups of 2003 Standard Industrial Classification (SIC) Codes. The groupings are Primary (10 to 14, 40 to 41), Engineering based manufacturing (28 to 35), Other Manufacturing (15 to 27, 36 to 37), Construction (45), Retail and Distribution (50 to 52), Knowledge Intensive Services (64.2, 65 to 67, 72 to 73, 74.1 to 74.4) and Other Services (55, 60 to 64.1, 70 to 71, 74.5 to 74.8).

higher usage of trademarks compared to manufacturing sectors. That is not the case, as both manufacturing groupings show higher trademark use than knowledge-intensive services (KIS) or other services.

	Patents	Design registrations	Trademarks
Lowest usage	Construction 8% Other services 8%	Construction 10% Other services 10%	Construction 11%
Highest usage	Engineering based manufacturing 30%	Engineering based manufacturing 28%	Other manufacturing 31%

Table 1 – lowest and highest formal IP usage by sector

In contrast to the whole sample, the levels of importance of formal IP protection in companies which were innovation active are higher for all kinds of protection. According to the CIS data between 2002 and 2004, 23% of innovators considered patents to be important compared to 24% for design registrations and 30% for trademarks.

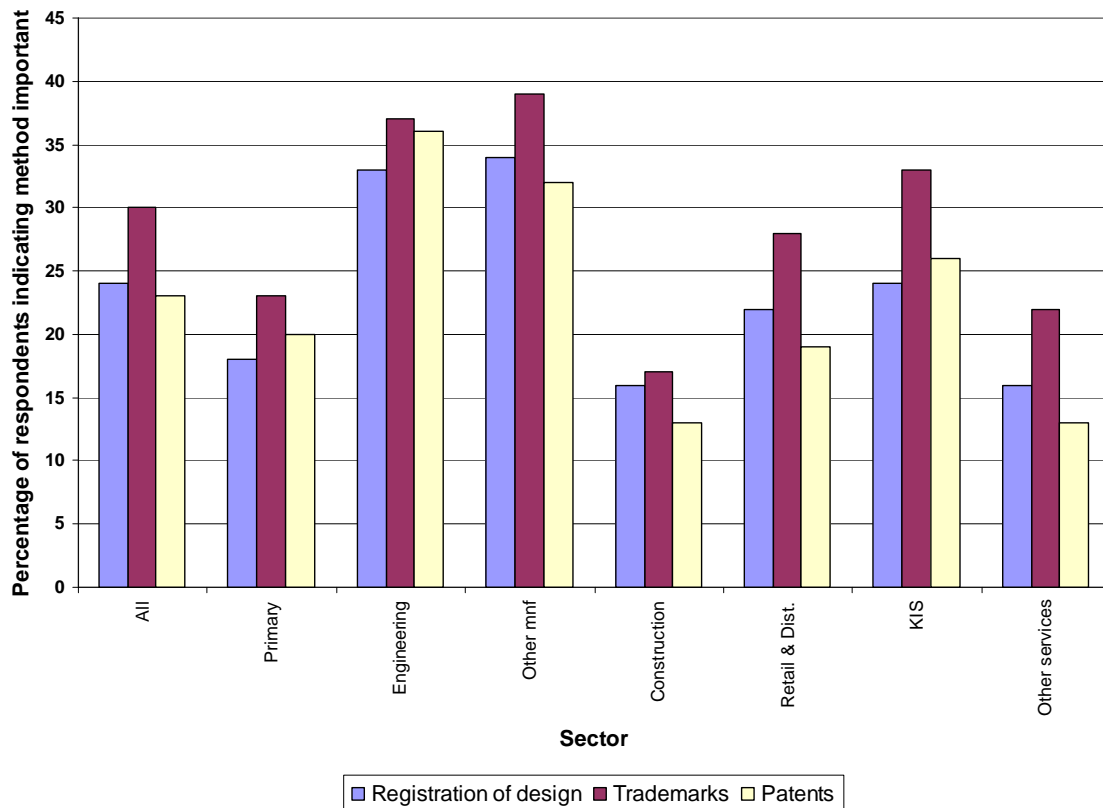


Figure 3 – UK innovators use of formal IPR methods 2002 - 2006 (DTI, 2006)

Again there is large variation between the sector groupings with a very similar pattern of low and high usage between the sectors and again manufacturing sectors being the highest users of formal IP protection.

	Patents	Design registrations	Trademarks
Lowest usage	Construction 13% Other services 13%	Construction 16% Other services 16%	Construction 17%
Highest usage	Engineering based manufacturing 36%	Other manufacturing 34%	Other manufacturing 39%

Table 2 – lowest and highest formal IP usage by sector for innovators

While the overall levels of importance and usage are of general interest we are more interested in whether the various indicators provide a better or worse measure of innovation. Looking at the difference between the whole sample compared to innovators by method of protection and sector grouping, it is interesting to note that trademarks consistently provide the greatest separation between the two sets. Figure 4 shows the differences and highlights that trademarks are most strongly separated for the two service groupings, with a difference of 2% in each case.⁸ In terms of being able to separate potential innovators from non-innovators, this is a first indication that trademarks in particular may be a clear signal. However, we do not have data correlating IP usage to successful innovation and this is an area that requires further data collection.

⁸ The figures from the CIS dataset are rounded to whole percentages and so care needs to be taken in assigning true distance. This is partly the reason why at this stage we have not considered a more complex analytical method.

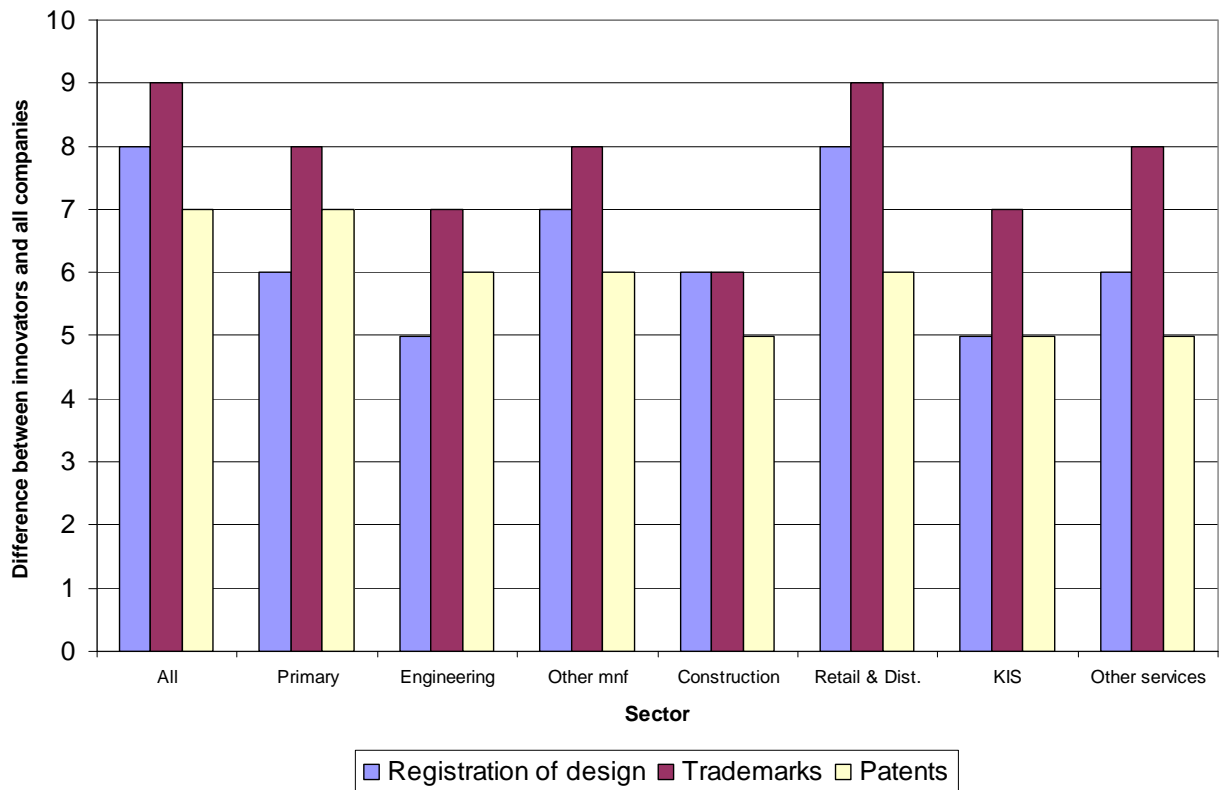


Figure 4 – Difference in IPR usage innovating companies to all respondents 2002 – 2004 (DTI, 2006)

3.2 Country level

Collection and analysis of data at the company or the national level is complicated by the multiple levels open to companies for registration of a patent, design or trademark. Table 5 below summarises the routes available for each and the legal basis.

	PATENTS	TRADEMARKS	DESIGNS
International level	International registration under the Patent Cooperation Treaty (through the World IP Organisation - WIPO)	International registration under the Madrid Protocol (through the World IP Organisation - WIPO)	International registration under the Hague Agreement (through the World IP Organisation - WIPO)
European level	European ⁹ registration (through the European Patent Office - EPO)	Community ¹⁰ registration (through the Office of Harmonisation for the Internal Market - OHIM)	Community registration (through the Office of Harmonisation for the Internal Market - OHIM)
National level	National registration (through the UK Patent Office in the case of the UK - UKPO)	National registration (through the UK Patent Office in the case of the UK - UKPO)	National registration (through the UK Patent Office in the case of the UK - UKPO)

Figure 5- Multiple levels of protection open to companies

At this initial stage we have focused on World Intellectual Property Organisation (WIPO) design registrations (referred to as industrial designs in WIPO statistics) and trademarks compared to international patents (PCT), EU patents and US patents. This allows us to quickly compare national levels of trademarks and design registrations to patenting. However care should be taken in interpreting this data, as a complete picture would have to include all possible routes and this is beyond the scope of this initial paper.

⁹ Geographical definition (i.e. countries belonging to the European continent).

¹⁰ Legal definition (i.e. 25 countries belonging to the European Union).

The data below is presented for 1998 – 2002 as data is available in these years for all of the indicators chosen. The level of usage is reported per 100,000 people, with current population used to represent population across the time period.¹¹ We have also worked with data from a small set of countries (China, France, Germany, UK, and the USA) in order to be able to have contrasts between nations widely accepted as innovation leaders and the dynamically growing economy of China.

Looking first at design registrations the data is relatively smooth and shows a strong contrast between countries. France has an obvious lead in terms of design registrations with over 120 per 100,000 people, compared to approximately 80 for Germany and 4 – 5 for the USA and China.

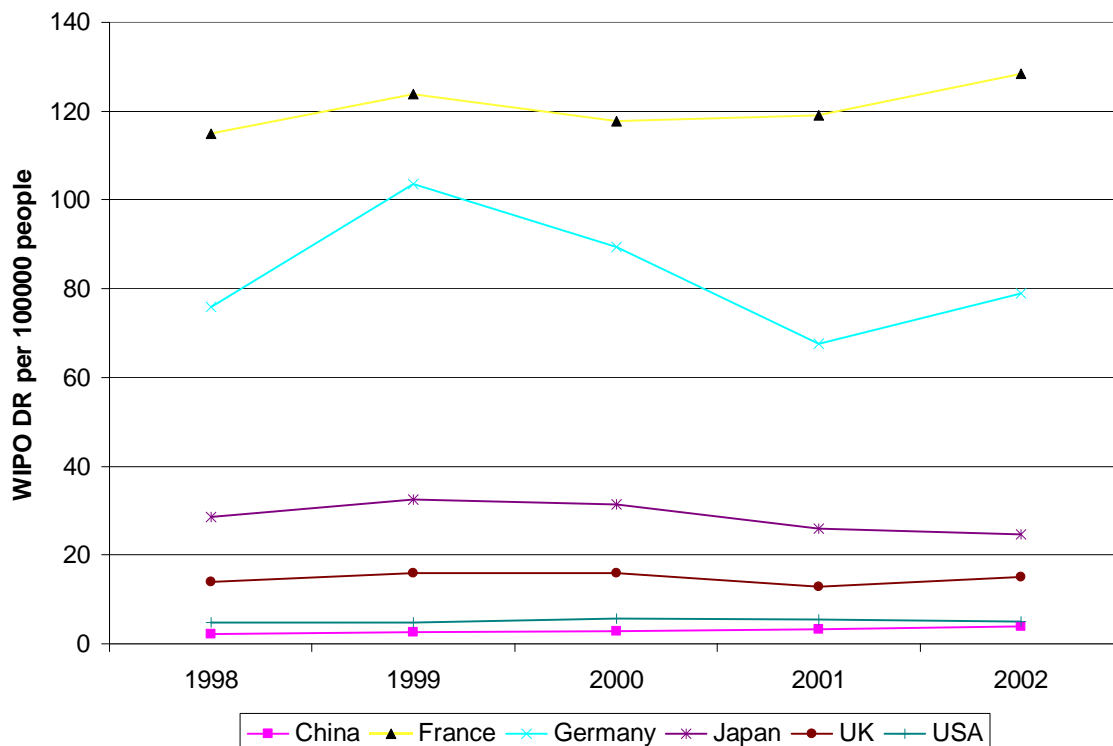


Figure 6 – WIPO design registrations per 100,000 people (WIPO, 2008)

Obviously there are usage patterns for companies from each country, with an expectation of home bias for the United States due to its large home market, but

¹¹ Population estimates were taken from the CIA World Factbook for 2008 available online at <https://www.cia.gov/library/publications/the-world-factbook/index.html>.

these patterns could also indicate the levels of exporting for these countries, i.e. the need for international protection.

The usage of trademarks, compared to that of design registrations, is of a similar order (between 5 and 120 per 100,000 people) for the range of countries included. However, the order of countries is significantly different between the two methods of IP protection as shown in figure 7 below. The UK, Japan and Germany are the leading countries in the registration of trademarks with between 70 and 100 marks per 100,000 people, compared to China and France who are similarly situated with approximately 15 international trademarks per 100,000 people.

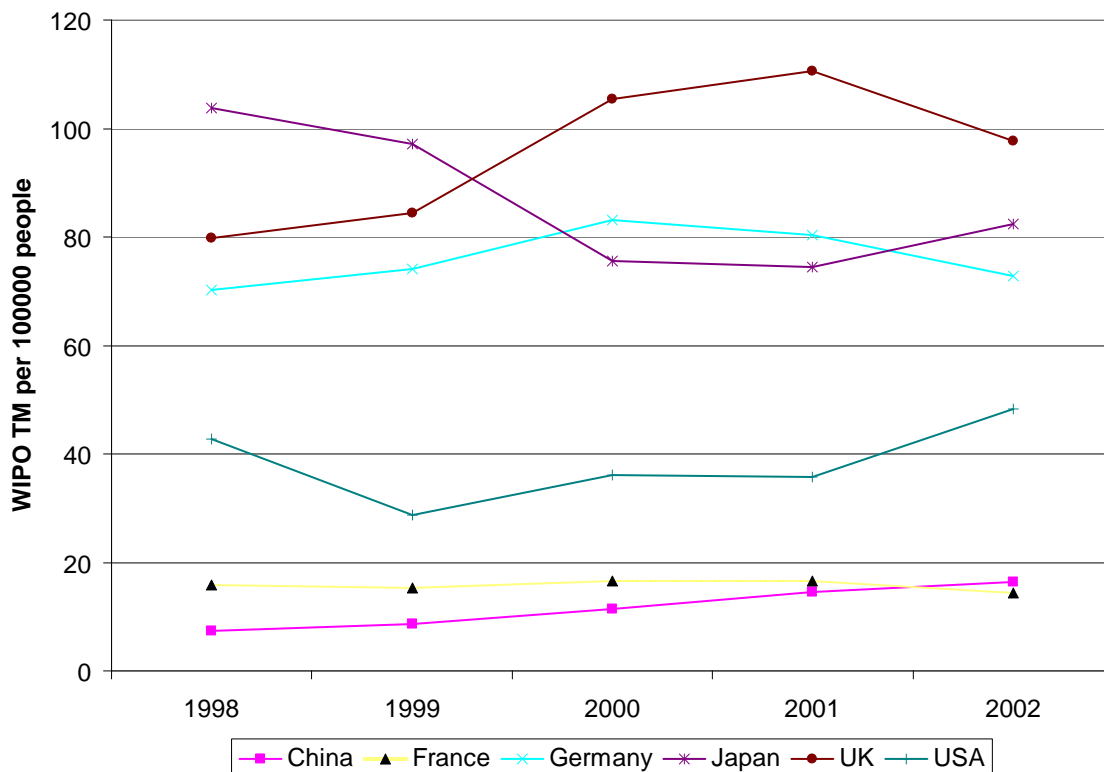


Figure 7 - WIPO trademarks per 100,000 people (WIPO, 2008)

Bringing together the above data with that available for patent applications at the international level (PCT), in the EU and in the United States, we can compare the relative intensity of IP routes for each country. This should provide an indication of the importance of each for each country and potentially whether there are underlying differences in the approaches to innovation. Figure 8 below shows the relative usage

of each IP method for China, France, Germany, Japan, the UK and the USA for 2002. Again the level of variation country to country is quite strong with what appears to be four distinct patterns.

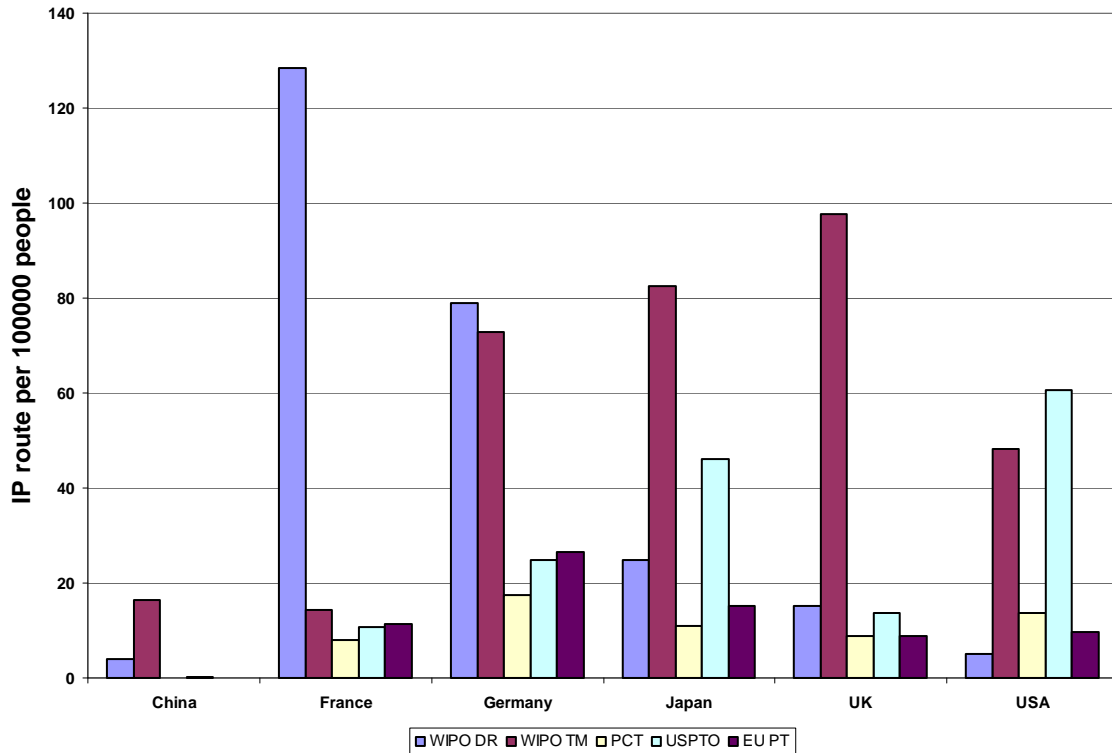


Figure 8 – Comparison of IP routes per 100,000 in 2002

- **Design registrations dominant** – France has a level of design registrations far beyond any of the other countries and a factor of six difference between design registrations nationally and all other types of IP protection.
- **Trademarks dominant** – For China and the UK the level of international trademark usage is in excess of all other IP routes by a factor of four to five.
- **Design registrations and trademarks dominant** – Germany is alone in having roughly equal amounts of design registrations and trademarks with both a factor of four above all of the patenting routes.
- **Trademarks and patents dominant** – In both the US and Japan design registrations are low while USPTO applications and WIPO trademark registrations are high. For the US this is affected by US patents including the

equivalent of design registrations (as utility patents) and so this requires further disaggregation.

Whilst beyond the scope of this initial paper, it would be instructive to correlate innovation modes (Lambert, 2008) with patterns of IP usage country to country to further investigate if the usage patterns are indicative of different approaches to innovation at the national level.

Finally, looking at the change for each country between 1998 and 2002 for each IP protection mechanism highlights a general increase in usage with patents showing the largest percentage increase.

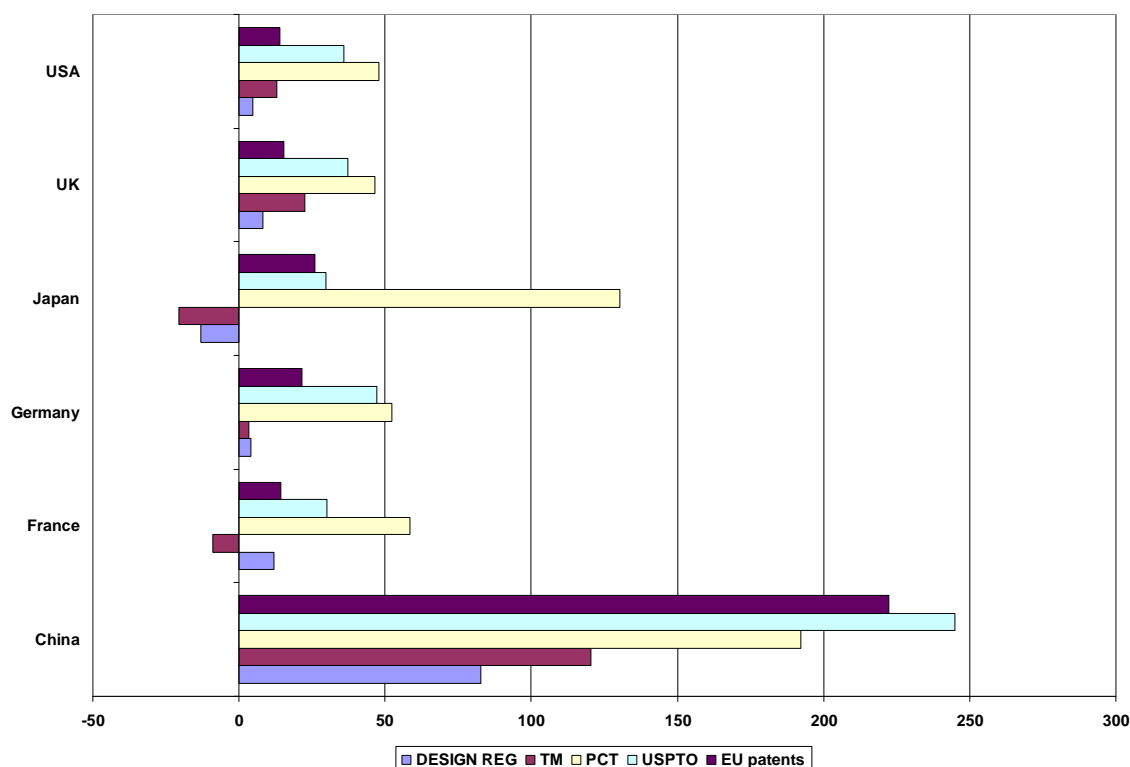


Figure 9 – Percentage change in IP route 1998 - 2002

The emergence of China into the global economy is reflected in the large increases in IP usage (albeit from a very low level). Over the period, China's applications for US patents has increased over 240% and the level of international trademarking has risen by approximately 120%. According to Yang and Clarke (2005) the increase in

patenting is being driven by non-residents up to 2000, when the level of patent applications becomes similar for residents and non-residents, whereas trademark registrations are strongly resident driven, with foreign registrations only accounting for 15% of the total between 1985 and 2002.

4. Discussion

What are we trying to measure when we develop innovation indicators? Griliches (1990) comments that “Roughly speaking, we would like to measure and understand better the economic processes that lead to the reduction in the cost of producing existing products and the development of new products and services.” This is a useful reminder that our goal is not the better understanding of the elements of innovation or invention rather we are striving to understand the bigger picture of change and economic growth. This current discussion of innovation measurement is important as significant efforts are underway in the UK and the USA to refine and extend national innovation indicators. The recently released innovation strategy for the United Kingdom (DIUS, 2008) indicates that “... NESTA [the National Endowment for Science, Technology and the Arts] will develop a new Innovation Index to measure UK innovation ...” with a pilot to be produced in 2009 and a full system in place in 2010. The US Department of Commerce established an advisory committee titled “Measuring Innovation in the 21st Century Economy” in 2006.¹² It recently reported its findings (Department of Commerce, 2008) and in a similar vein to the UK recommended “... development of a national innovation index when more work has been done on both data collection and analysis of innovation drivers.” There is a need for open and frank discussion and debate on existing indicators and their strengths and weaknesses so the new efforts do not repeat errors of the past nor ignore the advances that have been made.

The data presented above indicates that design registrations and trademarks, at the international level, are widely used and could provide a new perspective on innovation activity, especially the second of Griliches’ targets the development (and introduction) of new products and services. The argument is not that we wish to use these exclusively, rather we believe that reliance on input measures alone (R&D spend, patenting) is misleading when discussing innovation outcomes as they are so far from the market and the use of composite indicators occludes what is happening

¹² Full details of the advisory committee can be found at <http://www.innovationmetrics.gov/index.cfm>.

within the innovation system. Co-reporting of a small number of indicators that stretch across the innovation system is suggested, with design registrations and trademarks as key elements close to market operating as early signs of the strength or weakness of innovation in an economy.

The lack of inclusion of design registrations and trademarks in many composite innovation indices and the dominance of patents as a proxy for R&D seems to indicate an over emphasis on technical invention and not enough consideration of the complete innovation cycle. The definition of innovation in most UK policy documents make some reference to exploitation or introduction to the market and so the distance from the market of our indicators should be a key consideration as it is widely recognised that innovation is highly non-linear and high rates of invention (i.e. patenting) may not necessarily lead to high rates of new product and service introduction, completing the innovation process. Even though the systemic nature of innovation is acknowledged in most policy analyses, it is not often acted upon. The fact that the popular interpretation of the Lisbon Agenda has boiled down to a single target for R&D spend as a percentage of GDP should be evidence enough that we do not retain the complex nature of innovation in our broader discussions on innovation.

Two key considerations for formal intellectual property measures as indicators of innovation must be the nature of the construct they relate to (technology, product, or company) and their distance from the market (or consumer). If we are trying to measure or monitor the level of innovation activity as the volume of new products and services entering the market these two combined provide us with a clear indication of whole products and services coming to the attention of customers. Table 3 summarises the nature of each type of IP and their distance to market.

	Patents	Design Registrations	Trademarks
Related to	Technologies Business processes (US)	Products	Products Services Companies
Distance to market	Distant from market, typically many patents embedded in single products	Close to market as the registration is an instantiation of the form of the product	Directly in contact with the consumer as a signalling mechanism

Table 3 – IP characteristics and distance to market

The core argument for the use of trademarks and design registrations as alternative or complementary indicators of innovation, beyond their use in composite indicators such as the SII, is their distance to market. The fact that they are closer to the moment of introduction for a new product or service implies that they may provide a more ‘real-time’ measure of innovation when compared to the lag from R&D and patenting to the introduction of a new product or service to the market. A weakness of both measures in terms of innovation is that they are not direct measures of technology-based innovation and they pick up other activities. However, an innovative shape, or an innovative branding exercise represent different types of innovative activity, both of which may lead to future economic growth.

The nature of patents as an output of innovative activity closer to invention than innovation is well recognised as is the variability of number of patents that come together in a single product (Griliches, 1990). The structure of design registrations and trademarks do not appear to be as well studied and so further work is suggested to analyse products and services according to the numbers of patents, design registrations and trademarks that apply. Much further work is needed at a more detailed statistical level on the correlations of trademarks and design registrations to innovative success and whether both provide early signals as to the rise and fall of innovation strength across nations.

Any discussion on innovation, its measurement and its impact will suffer from our varied interpretations of the term innovation. There has been significant effort expended on trying to define clearly what is and what is not innovation, as discussed above in relation to the Oslo Manual. However, there appears to be a translation problem when it comes to policy analysis and development. There appears to be a hangover from the linear model of innovation that investment in R&D will inevitably lead to innovation and therefore it is enough to measure that. Changes in the world economy and the emergence of new models of innovation make that assumption invalid and therefore further work on applicability of innovation indicators and crucially how they can be used in policy is essential if governments are to have evidence based policy development in support of innovation and continued economic growth.

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