THE INTERNATIONAL DIFFUSION OF PROJECT MANAGEMENT

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ABSTRACT

This paper examines the international diffusion of one business practice, project management, through the prism of prior literature and data on the diffusion of ISO 9000. The study took an inductive approach, building theory through the iterative collection and analysis of quantitative and qualitative data. The findings problematise the central position accorded to the S-curve model and neo-institutional theory in explaining technology diffusion. The research posits three distinct processes driving the diffusion process: utility, institutional isomorphism, and competitive isomorphism, with the latter consisting of three primary mechanisms: competitive imitation, trendslators and fashion retailers. Contrary to prior literature, national, quasi-professional associations are found to be central to the diffusion process and play a key role in advocating and containing management technologies.

INTRODUCTION

A 'management technology' is an institutionalized set of practices and techniques designed and implemented to achieve explicit managerial objectives. Examples include ISO 9000, Project Management, Activity Based Costing, JIT, MRP, BPR, Six Sigma and so forth. The concept is broadly equivalent to related terms such as 'management practice,' 'management innovation,' 'process management,' 'managerial innovation,' 'administrative innovation' and 'organizational innovation' (Benner and Tushman, 2002; 2003; Green, 2004; Benner and Veloso, 2008; Birkinshaw et al., 2008). I prefer the term 'management technology' because 'technology' is less prejudiced than 'innovation' — and there is a pro-innovation bias in the literature — and 'management' is broader in scope than 'administrative'. This paper focuses on the spread of one popular management technology, namely 'project management'. The paper begins by briefly describing project management. It then outlines the predominant explanations and conceptual architecture around why and how management technologies diffuse. There is considerable theory and data on the diffusion of ISO 9000, and so this provides the main theoretical and empirical prism through which to examine project management adoption in different countries. *En passant*, this gives a novel perspective on prior theory and on the adoption of these technologies more generally. The paper then discusses data collection before proceeding to theorize through analyzing the data. The study's contribution is then discussed, before concluding by outlining future research.

PROJECT MANAGEMENT

In this paper, project management (PM) is understood as a diverse but well-recognized set of management practices and techniques used to plan, organize and manage resources to achieve specific project objectives. This basket of techniques includes the critical path method, Gantt charts, earned value analysis, methods to control risk and scope, work breakdown structure, project evaluation techniques, etc. These techniques have become standardized and institutionalized through the two main project management associations, the Project

Management Institute (PMI), founded in 1969 in the United States, and the International Project Management Association (IPMA) founded in Europe in 1967, as well as through other standardizing bodies such as the Office of Government Commerce (an independent office of the UK Treasury) which maintains the PRINCE2 method of managing projects. In 1996, PMI published "A Guide to the Project Management Body of Knowledge (PMBOK)" (PMI Standards Committee and Project Management Institute, 1996), which sought to document and standardize generally accepted project management practices. The IPMA followed a similar route in 1999, when it published the IPMA Competence Baseline, which identified and described 46 technical, behavioural and contextual competencies of professional project management (the 2006 version of this Competence Baseline is available at http://www.ipma.ch/Documents/ICB_V._3.0.pdf). By the end of 2008, IPMA and PMI had issued 86,545 and 262,821 certificates respectively, across 52 countries.

There is no prior research on the diffusion of project management, which is surprising given the scale of the literature on the diffusion of management technologies. A significant part of this wider literature has focused on the spread of ISO 9000, and, because it has similar aspects to project management, I will use this as the primary theoretical and empirical touchstone in this research. Thus, before engaging with existing theory, I will describe ISO 9000 and briefly contrast it with project management.

ISO 9000 is a family of standards for quality management systems, maintained by ISO, the International Organization for Standardization. The primary standard within this family is ISO 9001, and companies with it are certified to have formalized business processes in place. The requirements of ISO 9001 include having and following a documented set of procedures for all key processes in the business to facilitate monitoring, control and continuous improvement. ISO 9000:1987 was the original quality management standard, and was based on the earlier UK Standard BS 5750 (first published in 1979). A new standard was published in 1994 and then the 2000 version combined three standards 9001, 9002 and 9003 into one, called 9001. The most recent standard, ISO 9001:2008 was published in November 2008.

Up to the end of December 2008, almost 1 million ISO 9001 certificates had been issued across 175 countries (The ISO Survey — 2008). In line with common practice and much of the literature, I will use the term ISO 9000 when technically the certification is to ISO 9001.

PM and ISO 9000 are similar but different in important respects. They are similar in that both are formal, structured, prescriptive attempts to manage and control an organization's operations. Both are rooted in an engineering/production model of the world that valorises a systematic, standardized, objective, and rational approach to getting things done. They are both institutionalized in being underpinned by quasi-professional bodies, consultancy groups, and various educational programs. Both have their strong advocates who, at the extreme, employ an almost religious, proselytizing rhetoric. Similarly, detractors use almost identical arguments against PM and ISO 9000, namely that the rational, scientific, instrumental approach suffocates creativity and innovation and that this diminishes business performance. The important differences between ISO 9000 and PM are as follows. First, ISO 9000 certifies organizations or business units while PM certifies individuals. Second, ISO 9000 has been around longer than PM, when one understands the former as ISO 9000 and the latter as PMBOK, and is much more extensively implemented. Third, while ISO 9000 and PM may both be considered "process management activities" (Benner and Tushman 2002), PM provides a template for carrying out almost any project, while ISO 9000 describes and helps regulate how a particular business operation will be done. In addition, PM is a looser system, in that no audit is required, and a business's customers rarely impose PM certification as a requirement.

PRIOR LITERATURE

In the vast literature on new technology diffusion, the dominant explanation is that the usage of new technologies over time typically follows an S-curve, where initially there is slow adoption, then a phase of relatively rapid adoption, and finally a period of slow adoption as the technology moves to saturation (Rogers, 1962/1995). The S-curve model is so endemic in

the literature that Geroski (2000) characterizes it as a 'single stylised fact'. The conceptual architecture draws on rational choice theory, epidemiology and bio-population growth theory, wherein the S-curve is seen as a consequence of the spread of information about the new technology, with the particular shape of the curve being dictated by factors such as the size and profitability of the investment (Mansfield, 1961). This premise also runs through much of the literature on the diffusion of management technologies (Teece, 1980; Guler et al., 2002; Saraiva and Duarte, 2003; Franceschini et al., 2006; Albuquerque et al., 2007).

Neo-institutional theory provides the main theoretical frame for understanding the diffusion of ISO 9000 (Guillén, 1994; Guler et al., 2002; Ketokivi and Schroeder, 2004). In particular, the literature is heavily influenced by DiMaggio and Powell's (1983) three modes of *institutional isomorphism* — coercive, mimetic and normative — through which organizations become more similar to one another, with *coercive isomorphism* (the homogeneity pressure stemming from powerful organizations on which the focal organization depends) being most important. For instance, Crowe (1998) identified the coercive influence of EU institutions in driving the diffusion of ISO 9000 certification, Guler et al (2002) highlighted the pressure generated by the state and foreign multinationals, while Corbett (2006) found that ISO 9000 diffused 'upstream' in global supply chains through companies imposing the standard on their suppliers. As a result, trade between countries becomes important, as firms import management practices from countries to which they export goods or services (Albuquerque et al., 2007). Other factors driving the international diffusion of ISO 9000 include the level of economic development in a country (Saraiva and Duarte, 2003), geography (Albuquerque et al., 2007), and the standard's perceived effect on financial performance, the latter being much debated (see Sampaio et al (2009b) for a useful review).

In a parallel literature on the diffusion of the environmental management standard, ISO 14001, the following factors have been posited as explaining international differences: a country's relative level of economic development (Corbett and Kirsch, 2001; Neumayer and Perkins, 2004); geography and cultural similarity (Albuquerque et al., 2007); a country's

export orientation, (Corbett and Kirsch, 2001; Neumayer and Perkins, 2004); previous experience of similar standards, especially ISO 9000 (Corbett and Kirsch, 2001; Vastag, 2004; Delmas and Montiel, 2008); the regulatory, normative and cognitive aspects of a country's institutional environment (Delmas, 2002); environmental attitudes (Corbett and Kirsch, 2001; Neumayer and Perkins, 2004; Vastag, 2004); the level of foreign direct investment (Neumayer and Perkins, 2004), and the standard's perceived effect on financial performance (Corbett and Kirsch, 2001).

RESEARCH METHODOLOGY

Management research is dominated by the hypothetico-deductive approach, wherein hypotheses are first deduced from the literature and then tested empirically. Temporally, research design is prior to data collection, akin to the way engineering design precedes construction. However, an inductive study (Locke, 2007) is appropriate in this case – although deductive analysis is not abandoned – since there are no prior studies of PM diffusion. In this research mode, research design and data collection are more implicated in one another, with decisions on what to collect being made on the analysis of prior data, akin to the way a detective pieces together a plausible and evidence-based story to explain a crime (Winks, 1969). Inductive reasoning has become almost exclusively associated with the analysis of *qualitative* data, to the point where (unfortunately) 'qualitative inquiry' and 'quantitative inquiry' have emerged as synonyms for inductive and hypothetico-deductive research respectively. Against this trend, this study adopts a largely inductive approach while examining, in the main, *quantitative* data.

The research uses nations, rather than organizations, as the comparative unit of analysis, based on the premise that macro-level differences reflect differences at the micro level. In this case, the macro level is the nation and the micro the organizational practice. Such an approach has been taken in previous studies (Corbett and Kirsch, 2001; Corbett, 2006; Franceschini et al., 2006; Albuquerque et al., 2007; Sampaio et al., 2009a), and more broadly,

many studies infer an understanding of micro level practices by aggregating to the level of the firm (rather than the nation). Regardless of the level of aggregation, the most salient analytical issue with multi-level analysis is over-interpretation, which occurs when differences at the macro level are attributed to specific differences at the micro level when other factors may provide a more compelling explanation (the so-called omitted variable bias). To address this issue, the goal of this research is not to identify single causal explanations, but rather to examine PM diffusion by comparing it with international data and theory on ISO 9000 diffusion. This comparative approach effectively reduces the potential set of omitted variables to the much smaller set that might explain differences in PM and ISO 9000 adoption levels. Indeed, this emphasis on comparison is central to grounded theory, which is probably the best-known form of induction in management research (Glaser and Strauss, 1968). This comparative method can also help generate theory since an early step in theory generation is identifying patterns in data, which are probably most visible when datasets are compared. For instance, such studies can highlight contextual factors that may be buried within prior explanations and may help contain the unwarranted and inappropriate extension of theories beyond their original domains. Comparison also provides a useful way of testing prior theory, since such a study leads us to ask why a prior explanation seems to hold in one situation but not in another, similar situation. Thus, instead of seeking correlations between variables, the inductive researcher tends to look for instances where expected correlations do *not* occur.

DATA COLLECTION AND ANALYSIS

The data collection and analysis progressed through six phases as detailed below.

PM Score and ISO 9000 Score

Centrally, this research is concerned with the relative adoption levels of PM and ISO 9000 in different countries, which I refer to as ‘PM score’ and ‘ISO 9000 score,' respectively.

Specifically, the focus is on the different levels of PM and ISO 9000 adoption across countries, rather than the speed at which PM or ISO 9000 diffuse.

PM Score measures the extent that PM has been adopted in a particular country. If formal PM methods are widely implemented in a country then this is likely to be reflected in a high number of PM certificates issued in that country. Having consulted experts from both certifying bodies, I rated IPMA's Level A, B, C and D certificates as worth 4, 3, 2, and 1 points respectively, and PMI's Project Management Professional certification as worth 1.5 points. Thus, the weighted number of PM certificates per capita is an indicator of the intensity of PM practice in each country. I obtained IPMA data for all years up to 2008 and PMP data for 2008 and 2004.

I was unable to obtain country-specific data on PRINCE2 certification, and this is one limitation of the research. A further limitation is the variance that necessarily occurs in the certification adjudication process. Notwithstanding these issues, the level of certification per capita gives a *prima facia* measure of how extensively PM methodologies are used in each country. This is called the *PM score*. The assumption is that the higher the PM score, the more PM is practiced in a country.

I compared the PM score with data from a study led by Roland Gareis (2002) where separate and independent assessors evaluated the level of PM practice in ten European countries using an agreed assessment framework. This comparison indicated that there was broad consistency between the two, quite different, methods of assessing the level of PM practice, although Austria's high PM score was not replicated in Gareis's study.

Similar to the PM scoring, the ISO 9000 score measures the number of ISO 9000 certificates awarded per capita in each country, using data provided by the International Standards Organization (available at: http://www.iso.org/iso/iso_catalogue/management_standards/certification/the_iso_survey.htm). The most recent publication was produced in 2009, with data up to 2008. Country data is

currently available from 1993 to 2008. The ISO survey methodology has been amended over the years to deal with some data consistency issues. For instance, the 2008 survey reported that the number of certificates in a number of countries was 'significantly over-stated' in the 2006 and 2007 surveys.

I confined my dataset to those countries that had both a PM Score and an ISO 9000 score, i.e., 52 countries.

In addition to computing the PM and ISO 9000 scores per capita, I also sought to relate the (weighted) number of certificates, by country, to the number of business enterprises with more than 10 employees, since companies with less than 10 employees are unlikely to get ISO 9000 certification. However, there were significant data consistency issues across the available datasets, and so the per capita results for all 52 countries are presented.

Economic Development

One would expect that the adoption of management technologies in a particular country would be related to that country's level of economic development, and indeed such a link has been found in studies into the diffusion of both ISO 9000 and ISO 14001 (Corbett and Kirsch, 2001; Saraiva and Duarte, 2003; Neumayer and Perkins, 2004). The measure of economic development used in this research was GDP per capita (obtained from the International Monetary Fund database at www.imf.org), largely because GDP and population are computed in a consistent manner across countries. To partly take account of different demographics across countries, I also analyzed the data using per head of labour force rather than per capita data. In essence, the results did not differ substantially, though the labour force data had more anomalies, which may be due to different ways that labour force is counted across countries. Similarly, assessing GDP per registered business proved problematic because of very different national practices in registering and counting businesses. I also sought to adjust for structural differences between countries (e.g., a predominantly agricultural country

could be expected to have less PM and ISO 9000) but again a robust and consistent dataset was not available.

To allow for possible time lag effects, and because PM data was available for 2004 and 2008, I correlated PM scores in 2004 and 2008 with GDP per capita in 2008 (Figure 1a). A correlation between PM score and GDP per capita might be masked by outliers that should be excluded, for legitimate and specific reasons. Proceeding on this basis, an analysis of residual diagnostics (standardized residual, Cook's distance, centred leverage value, standardized DfFits, standardized DfBetas) identified Norway, Austria and Iceland as outliers in the dataset. Norway is an outlier because of its exceptionally high GDP per capita (largely due to its oil and natural resources), while both Austria and Iceland have very high PM scores. Akin to Luxembourg, which is often excluded from international comparisons, Iceland might properly be excluded because it is such a small country. Thus, if Austria, Iceland and Norway are excluded, we find a linear relationship between PM Score and GDP per capita (Figure 1(b)). The R^2 linear measure is 60 percent, which indicates a strong correlation, with only one variable (PM intensity) accounting for 60 percent of the variance in the national wealth data.

INSERT FIGURE 1(a) AND FIGURE 1(b) ABOUT HERE

The relationship between ISO 9000 adoption levels (2004) and GDP per capita (2008) was similarly analysed, as depicted in Figure 2(a). In this case the relationship was found to be non-linear (the linearity assumption was found to be invalid), while an analysis of residual diagnostics, assuming a quadratic fitted the data, identified Norway, Iceland, Switzerland and Italy as outliers. As before, Norway and Iceland can be excluded from the dataset, but Switzerland and Italy's outlier status (due to their very high levels of ISO 9000 adoption) warrants further investigation. When the four outliers are excluded, a quadratic fitted the data with an R^2 linear of 0.5 (Figure 2(b)).

One interpretation of the absence of a linear relationship between ISO 9000 and economic development is because factors identified in the literature — such as the coercive pressure of the state, foreign multinationals and/or powerful customers — are having an influence. Alternatively, the anomalous position of Slovenia, the Czech Republic and Hungary, which have low GDP per capita and high adoption rates for ISO 9000, might be related to these countries joining the EU in 2004. However, an important point is that these factors are *not* at play in the case of PM, where we find a linear correlation between PM Score and GDP per capita.

Management Technologies and Innovation

A country might have a high PM score because its economy is constituted by sectors that are suited to project management methodologies (a similar point applies to ISO 9000). However, the absence of consistent international data on industry composition precluded such an analysis. A variation on this line of inquiry is to speculate that industrial sectors with high levels of innovation will have high PM scores, because project management purports to provide a structured way to manage change, and change is practically a synonym for innovation. Aggregated to the national level, one would expect nations that have high levels of innovation to also have high PM scores. Furthermore, just as one would expect a link between innovation and PM, one would also expect a link between ISO 9000 and innovation because continuous improvement (i.e., innovation) is integral to both ISO 9000 and, more broadly, to quality management. These intriguing hypotheses have been explored in the literature, which I will now briefly examine.

The link between PM and innovation may be traced back to the 1960s when an early feature of the PM approach, namely the matrix organizational structure, was advocated as more conducive to new product development than the archetypical model of bureaucratic organization (Thompson, 1967; Galbraith, 1973). Further research highlighted some deficiencies in the matrix pattern and, over time, many practitioners and gurus argued for a

fully projectised approach (e.g. Peters (1990)). Echoing Peters and others, Keegan and Turner (2002) state that "Projects are portrayed in the literature as a fast, flat, flexible approach to managing change (and innovation) in organizations. We anticipate therefore that project-based firms provide a context supportive of innovation" (p. 368-9). However, they wonder if this is actually the case, noting that, surprisingly, "the traditional innovation literature largely ignores project management …[while] the project management literature… largely ignores innovation" (p. 368). Drawing on interviews with practitioners, they conclude that while project-based firms use PM to manage innovation projects to facilitate innovation, they posit that these practices may actually be stifling innovation. In explaining this, they point to the paradigm's engineering tradition and the institutionalization of PM knowledge, both of which emphasize the control of work to specific time, cost and quality constraints. While the argument is compelling — and parallels the criticism of ISO 9000 — there is little evidence to support it.

Aggeri and Segrestin (2007) take a somewhat similar tack, arguing that while PM is an appropriate way to manage *product development* — which is focused around existing knowledge and predefined targets, processes and deadlines — it is misplaced when applied to *radical innovation*, where the focus is on outperforming dominant designs, exploring new alternatives and constructing new knowledge (echoing March's (1991) distinction between exploitation and exploration). However, it is difficult to generalize their assertion from the single case they studied.

One might expect a strong link between ISO 9000 and innovation, because the standard, especially since it was updated in 2000, is explicitly concerned with continuous improvement, which necessarily involves change and innovation. More broadly, the link between quality and innovation is reflected in the fact that over 25% of the 82 presentations at the 2007 Annual Conference of the American Society of Quality had some version of innovation in their title (Cole and Matsumiya, 2007). However as far back as 1978, Abernathy (1978) was arguing that a firm's focus on productivity might inhibit its flexibility and ability to innovate,

and variants of this criticism are routinely levelled at formal quality management systems such as ISO 9000 (Sitkin and Sutcliffe, 1994; Boiral, 2003; Cole and Matsumiya, 2007; Adler et al., 2009). Thus, it is surprising that there is relatively little research into the link. For instance, Sampaio et al (2009b: 50) reviewed 92 articles about ISO 9000 but none of these examined the relationship between ISO 9000 and innovation performance. One body of work not included in this review is Benner and Tushman's research into the impact of "process management" activities – such as ISO 9000 – on technological innovation (Benner and Tushman, 2002; 2003; Benner and Veloso, 2008). Drawing on March's (1991) argument that innovation consists of *exploitation* of existing knowledge and *exploration* in search of new knowledge they found that process management facilitated exploitation but was also associated with *decreases* in exploratory forms of innovation, a finding largely supported by Cole and Matsumiya (2007).

This stream of research indicates that there may be a link between a country's propensity to innovate and the degree to which a country has adopted project management (and, by comparison, ISO 9000). Two available measures of national innovation can be used to investigate the connection: the European Innovation Scorecard and the Global Summary Innovation Index. The former has been published by the European Commission since 2001 as a measure of the innovation performance of 37 states, including the US, Canada and Japan. In this scorecard, countries are assigned an overall innovation score through aggregating 25 factual innovation indicators, including measures such as the number of new science and engineering graduates per 1000 population, public R&D expenditure as a percent of GDP, percent of SMEs innovating in-house, percent employment in high-tech services, and number of patents per million population. The scorecard produces a rich source of comparative data, and while a number of anomalies and idiosyncrasies have been identified in the index (see Schibany & Streicher (2008) and Hollanders & van Cruysen (2008) for reviews), it is still "the most widely watched benchmarking tool in the discussion of European technology policy" (Schibany and Streicher, 2008: 717).

The Global Summary Innovation Index is another measure of national innovation performance (Hollanders and Arundel, 2006). It is similar to the EIS but has fewer indicators and provides data on the innovation performance of seven additional countries. I decided to use the EIS rather than the GSII because PM certification is very low in the additional countries covered by the GSII and because the correlation coefficient between 2005 EIS and 2006 GIS performance is close to 1 (Hollanders and Arundel, 2006: 23). (Both the EIS and GSII data may be obtained from the Pro-Inno website at http://www.proinno-europe.eu).

In an initial analysis, the national PM scores were correlated against national innovation scores. This analysis showed that a linear relationship did not fit because the homogeneity of variance assumption was found to be invalid, while a visible curvature in the plot of standardized residuals against predicted values indicated that a quadratic model would be more appropriate. A quadratic model of the relationship between the PM Score and Innovation Score was plotted with 2004 and 2008 data on the two variables (30 countries). The residual diagnostics and measures of leverage and influence indicated that Austria and Iceland (both have exceptionally high PM scores) should be removed from the dataset. The resulting quadratic for the 2008 data, excluding the two outliers, is plotted in figure 2(a).

INSERT FIGURE 2(a) AND FIGURE 2(b) ABOUT HERE

The R^2 in figure 2(a) computes as 66.4 percent, which is a very high correlation given that the innovation score is aggregated from 25 different indicators. The analysis shows that higher PM scores are associated with higher levels of innovation — up to a point (about 600 PM weighted certificates per million population). Possible explanations for the right hand 'tail' will be developed in later stages of this study.

In contrast to the quite strong relationship between PM and innovation, figure 2(b) shows that there is no relationship between the ISO 9000 score and innovation (R^2 linear and R^2

quadratic are effectively zero for 2004 and 2007 data). This is somewhat surprising, because one would expect the wealthier countries to be more innovative *and* have higher QM scores. Indeed the wealthier countries are more innovative (there is an R^2 linear of 69 percent between innovation and GDP per capita once Norway is excluded) leading one to expect some correlation between the ISO 9000 score and innovation. The fact that there is not lends some credence to the argument that ISO 9000 fosters standardization and painting-by-numbers, and stifles creativity and innovation (though this would imply that there should be negative correlation). Another possible interpretation is that ISO 9000 has a positive relationship with exploitation but a negative relationship with exploration (as Benner and Tushman's research would suggest) and that one nullifies the other. However, this thesis appears implausible, although it cannot be tested because the EIS dataset does not decompose innovation into these elements.

The absence of a relationship between ISO 9000 and innovation is important, especially when contrasted with the strong link between project management and innovation, and the very similar arguments made against both technologies Of course, a statistical correlation does not imply causality, and indeed it is possible that a moderating variable, such as the structure of a nation's economy, may be determining the link between PM and innovation. If such a moderator is having an effect, then it is linking PM, but not ISO 9000, with innovation. To inquire into this would require further research.

The next stage of the research focused on identifying some contextual factors underlying the patterns depicted in figures 1 and 2.

Delphi Study

The purpose of this stage of the research was to develop a more qualitative understanding of the diffusion of PM that might explain and be consistent with the datasets depicted in figures 1 and 2. To this end, I conducted a Delphi study of individuals who were knowledgeable about project management, and especially project management certification, in the different

countries under study, and, to a lesser extent, individuals who were knowledgeable about ISO 9000 certification internationally. The panel consisted of 17 members from Ireland (2), Austria (4), the United Kingdom (3), the United States (1), Italy (3), India (1), South Africa (1), Slovenia (1), and Iceland (1). The panel was made up of academics, educators, project management practitioners, and consultants. Each member was given the graphical data from the first research phase and was asked to explain the variation in adoption levels, paying particular attention to those data points that might appear anomalous. In addition, they were asked to comment on the differences between the PM and ISO 9000 data. The responses were then compiled, recurring themes identified and validated through reverting to panel members.

Virtually all respondents identified the key role of project management consulting, certifying and educational bodies in driving different levels of PM adoption between countries. In particular, many of the non-Austrian panel members observed that the "Austrian Project Management Association is very well established" and has built strong links with schools, universities, and universities of applied science, while the Vienna University of Economics and Business, where the Austrian Project Management Association was originally based, was recognized as having "decades long engagement with the subject". The very large number of organizations providing training and consultancy in project management in Austria was also highlighted as was the length and depth of engagement by these bodies. For instance, one panel member noted that the first international association of project managers, INTERNET, which eventually became the IPMA, held its first conference in Vienna, Austria in 1967. Others identified Roland Gareis, who is Director of the Project Management Group at the Vienna University of Economics and Business, as a significant player in spreading project management in Austria since he set up his project management consultancy in 1983. Interestingly, there is little or no reference to actors such as these in the literature on the diffusion of ISO 9000 and ISO 14000, although their role is recognized in the wider 'management fashion' literature (Abrahamson, 1991; Kieser, 1997; Benders and Van Veen,

2001; David and Strang, 2006). In contrast to the Austrian case, the high levels of PM adoption in Iceland was attributed, not to the role of consultants and professional associations, but instead to the fact that it is a small community, that 'everyone knows what everyone is doing', and that the perceived value of certification spread easily by word-of-mouth within this community. This seems to be illustrative of the 'bandwagon' effect posited by Abrahamson and Rosenkopf (1993), which might also explain the right-hand 'tail' in figure 2(a).

The Delphi study did support extant research on the coercive role of states and powerful customers in driving the adoption of ISO 9000. For instance, the relatively high levels of ISO 9000 adoption in Eastern Europe was linked, by some members, to the need to impress potential export markets, and the activity of the state in promoting certification. However, this coercive pressure is largely absent from the project management domain, although IPMA certification has recently emerged as a requirement in some contracts in Austria.

Overall, the Delphi study highlights that project management is an artefact bought and sold in a marketplace. Moreover, if there is a market for management technologies, then the presence of a technology in a market might influence, either positively or negatively, the adoption of another technologies. For instance, research by Corbett and Kirsch (2001) indicates that ISO 9000 certification is an important factor explaining the diffusion of ISO 14000. Thus, the next phase of the research used a cluster analysis to examine whether there were links between PM Scores, ISO 9000 scores, GDP per capita and national innovation scores.

Cluster Analysis

Thus far, the research has analyzed four distinct variables across a range of countries: PM Score, ISO 9000 Score, GDP, and Innovation Score. One would expect these variables to be related in that the more innovative countries are probably wealthier, and the perceived benefits of a management technology (in terms of innovation and financial performance) are

presumably factors that influence its diffusion. To this end, I used cluster analysis to classify the countries into groups, based on the four variables, using the data that yielded the highest correlations in the previous analysis (i.e., 2008 data for PM and 2004 data for ISO 9000). The analysis was based on hierarchical agglomerative cluster analysis, which seeks to identify distinct groupings of observations that are homogenous within a group and heterogeneous across a group. Clusters were linked using Ward's method, which uses an analysis of variance approach to evaluate the distance (here squared Euclidian distance) between clusters. All variables were standardized with a mean of 0 and standard deviation of 1 using z-scores to reduce the influence of different measures, units and scales. The cluster solution was determined by investigating the size of the jump in the distance measures when two clusters were merged.

The cluster analysis reduces the dataset of 30 countries into 6 clusters, as depicted in Table I. The rightmost column in Table 1 is an indicator of the relative importance given to PM compared to ISO 9000 (i.e., it divides the PM score by the ISO 9000 score).

(1) *Switzerland.* Switzerland rates high on all four measures. It has an exceptionally high level of ISO 9000 certification, which might be explained by the fact that the International Standards Organization is based in Geneva. Uniquely, it also has a high PM score.

(2) *The PM Enthusiasts*. This group consists of just Austria and Iceland, both of which have exceptionally high PM scores. Both countries are quite wealthy and have a moderate to high innovation score. The earlier analysis identified these two countries as outliers due to their high PM scores, and this is why they form a distinct cluster in the cluster analysis. The other mean values indicate that Austria and Iceland might otherwise be properly located in the High PM/Low ISO 9000 cluster.

(3) *The High PM / Low ISO 9000 Cluster*. These countries are, in the main, wealthy innovators, with low-to-moderate ISO 9000 and high PM scores. Norway is something of an

anomaly; but for its oil-based wealth, it might be more properly located in the High ISO 9000/ Low PM cluster.

(4) *The High ISO 9000 / Low PM Cluster*. This cluster is less wealthy than cluster 3, and has much higher levels of ISO 9000 and much lower PM scores.

(5) *The ISO 9000 Enthusiasts*. These countries are, on average, not wealthy, have relatively low innovation scores, and very low PM scores. However, they have very high ISO 9000 scores, which makes the PM/ISO 9000 ratio very low indeed.

(6) *The Poor Relations*. These countries rate low on all four variables.

INSERT TABLE I ABOUT HERE

This clustering will be discussed in the discussion section below.

It's Just a Fashion

While coercive isomorphism is central in the literature on ISO 9000 diffusion, the evidence from this study is that it is much less important in explaining the spread of project management. Instead, the Delphi study indicates that consultants, universities and professional associations play an important role in the process, and that the adoption of project management may be better understood as a purchase decision in a market of suppliers and consumers. This marketing perspective is taken in the 'management fashion' literature which posits that management innovations are usefully understood as fads or fashions (Abrahamson, 1991; Kieser, 1997; Carson et al., 2000; Cornelissen and Lock, 2000; Benders and Van Veen, 2001; David and Strang, 2006; Abrahamson and Eisenman, 2008). In an influential article, Abrahamson (1991) distinguishes between a *fad*, where group members imitate one another, which can create a bandwagon effect, and a *fashion*, where group

members adopt innovations advocated by external 'fashion-setting' organizations. Thus, this part of the research explores this fad/fashion aspect of project management diffusion.

Following previous studies in the management fashion literature, counts were made of the number of articles that had 'project management' in the title in the ABI/Inform database since 1984. To allow for variation in the annual number of articles indexed, I multiplied the count of articles in a year by an adjustment factor, namely the ratio between the total number of articles indexed in 1984 and the total number of articles indexed that year. I also counted whether the articles were classed by ABI/Inform as 'scholarly' or 'non-scholarly' because this gives one indication of the locus of the conversation. The resulting plot (figure 3(a)) shows that, since 1984, project management was most prevalent in the literature in the late 1980s, and, after a sharp fall in the early 1990s, it has steadily but slowly grown since then, though the citation counts in 2010 are similar to the counts in 1984. The ratio of scholarly to non-scholarly articles has remained much the same over the period except for the late 1980s when project management was more widely present in non-scholarly publications.

INSERT FIGURE 3(a) TO 3(d) ABOUT HERE

Continuing the comparative approach adopted throughout this study, I did a similar count of articles with ISO 9000 or ISO 9001 in the title, and this is plotted in Figure 3(b). In stark contrast with the project management data, there is a spike in the ISO 9000 count in the early 1990s followed by a rapid decline, with the term almost disappearing from non-scholarly publications by 2000. Interestingly, while the world total of ISO 9000 certificates has grown annually — up from 660,132 in 2004 to 982,832 in 2008 — the number of certificates per capita has *dropped* in the UK, as shown in Figure 3(c), which is significant because the standard has probably the longest tradition in that country (the original standard was based on the British Standard BS5750). The reasons for the decline in the UK are beyond the remit of this paper, but it is interesting to observe the parallel rise and fall of ISO 9000 in the

literature, as depicted in Figure 3(b) and the rise and fall in certificates (Figure 3(c)), and the ten-year gap between the two peaks. Not least, the decline in the number of UK certificates suggests that the standard technology diffusion model, which posits that diffusion follows an S-curve to saturation, is an inadequate basis for explaining the international spread of management technologies. Instead, the fashion perspective seems more compelling. It seems most likely that fashion setters played an important role in popularizing ISO 9000 during the early 1990s, but as it was spreading in practical implementation, it was rapidly disappearing from the non-scholarly literature, to be replaced by other fashions such as 'six sigma' (Figure 3(d)).

DISCUSSION

This research has examined the spread of project management, using previous studies on the diffusion of ISO 9000 as a theoretical and empirical prism. In turn, this optical exercise provides a novel perspective on the diffusion of management technologies more generally. The evidence from this study identifies the following three distinct diffusion processes: utility, institutional isomorphism, and competitive isomorphism.

Utility

The utilitarian position is that actors are utility maximizers and will adopt, not adopt, or discard particular management technologies based on rational, objective calculation and evidence. In particular, utility maximization provides a straightforward argument for why some technologies go out of fashion: they prove not to be worthwhile. Surprisingly, this utilitarian, sovereign view of technology adopters is absent from the literature, which instead tends to depict actors as servants of powerful actors on whom they depend, or suckers for a fashion, or imitators jumping on a bandwagon. This may be because the literature has focused on the adoption rather than the abandonment of management technologies. Utility analysis presumably plays more of a role in the latter decision because evidence should be available on actual costs and benefits — both within the organization and more widely — on

which utility calculations must be based. Moreover, not only are agents rational and calculative, they are also reflexive and may well recognize fads and fashions and their drivers. For instance, the virtual disappearance of the term ISO 9000 from the non-scholarly literature, the sharp decline in certification in the UK in the last decade, and the significant number of studies that are critical of the standard (Sampaio et al., 2009b) suggests that actors made utilitarian calculations to abandon ISO 9000 since 2000. Indeed the current study, while not conclusive, certainly does not provide evidence supporting ISO 9000 in that it found no correlation between national ISO 9000 scores and innovation performance, and high ISO 9000 scores were negatively correlated with wealth. In contrast, the same evidence does not appear to be justifying the abandonment of PM, either in the non-scholarly literature or in practice. Perhaps not coincidentally, the current study found a linear relationship between PM and wealth, and found that innovative countries are much more likely to use PM than those that are less innovative.

Institutional Isomorphism

This study suggests that neo-institutional theory, which provides the dominant theoretical frame for understanding the diffusion of ISO 9000, is an inadequate conceptual carapace for explaining the international diffusion of project management. While previous studies have indicated that states, large multinationals and EU institutions play an important role in the diffusion of ISO 9000, there is little evidence that organizations are coerced into adopting PM. DiMaggio and Powell's concept of normative isomorphism is also insufficient because project management (and indeed quality management) does not have a recognized profession — akin to doctors, teachers, lawyers, etc. — to provide the common formal training and professional networking that underpins normative isomorphism. Likewise, there is little to suggest that their third mode of isomorphism — mimetic isomorphism — is driving organizational homogeneity. Mimetic isomorphism is a response to high uncertainty (e.g., when technologies are poorly understood, goals are ambiguous, or when the environment creates symbolic uncertainty) and, while one cannot preclude it, it is unlikely that variation in

uncertainty can adequately explain the diversity in the adoption levels present in the datasets. Moreover, competition and game-playing add an extra dimension to mimesis, which is not captured in DiMaggio and Powell's formulation (see Lieberman and Asaba (2006) for development).

Competitive Isomorphism

DiMaggio and Powell's three forms of institutional isomorphism — coercive, normative and mimetic — has provided an enduring frame for understanding why organizations come to be similar to one another through adopting the same management technology. However, this study turns our attention to *competitive isomorphism* which DiMaggio and Powell (p. 149) identified as distinct from institutional isomorphism, but which has been largely ignored in the literature, most especially in the literature on technology diffusion. Competitive isomorphism involves pressures towards similarity resulting from market competition. For instance, what the cluster analysis indicates is that, with the exception of Switzerland, countries appear to have taken to either PM or ISO 9000 but not both, indicating that the diffusion of one management technology may affect the diffusion of others.

This study indicates that competitive isomorphism operates through three distinct processes: *competitive imitation, trendslators,* and *fashion retailers*. The first process, *competitive imitation* posits that technologies diffuse through the mechanism of the market, which, paradoxically, fosters both difference *and* sameness. The explanation for this paradox is as follow. In a competitive market, there is, at a minimum, a customer and a (perhaps large) number of potential suppliers, each one seeking to differentiate itself from its competitors. In such a situation, there is an incentive for each supplier to differentiate itself from one set of suppliers (a heterogeneity impetus), and, simultaneously, to be *similar* to another set of suppliers (a homogeneity impetus) that it perceives to be successful or respected by the customer. In other words, *isomorphism may occur as organizations become similar through trying to be different*. So, for instance, organizations may adopt a management technology

like project management because they perceive that it will make them more like some organizations *and* less like others. From this perspective, agents base their decision to adopt, reject or abandon a technology primarily based on what other agents are doing or not doing, rather than on a simple utility calculation of the technology's benefits and costs. And this process is complicated in the reflexive, gaming network that is the competitive market where organizations are anticipating what their competitors will or will not do, and where imitation can snowball to create a 'bandwagon' effect (Abrahamson and Rosenkopf, 1993, 1997). (This is quite different from DiMaggio and Powell's mimetic isomorphism, which is based around a subject-object dyad in conditions of high uncertainty). While this study did not focus on imitation, evidence of the competitive imitation emerged in the Delphi study where panel members attributed Iceland's high PM score to imitation in the country's densely interlinked social network.

While the primary focus of the technology diffusion literature is on the behaviour of technology adopters, the concept of competitive isomorphism shifts our attention to those who persuade, market and promote a particular technology, and on the dynamics of the market. So, for instance, a compelling rationale for high PM scores in one country relative to another is that this reflects that relative energy and activity of local consultants, gurus and the certifying bodies, who *persuade* rather than coerce organizations to adopt PM or ISO 9000. In particular, the relative activity of national certifying bodies seems especially important since their ambit is typically limited to *national* boundaries. Thus, instead of the rather deterministic models that have tended to dominate the ISO 9000 diffusion literature (Teece, 1980; Corbett and Kirsch, 2001; Albuquerque et al., 2007; Marimon et al., 2009), this study centres attention on the 'idea entrepreneurs' (Abrahamson and Fairchild, 1999) and 'change agents' (Rogers, 1962/1995; Birkinshaw et al., 2008) on the supply side of each management technology market. However, these terms are too broad in that they cover a multitude of quite different actors that should be distinguished. Moreover, the analytical value of the terms is limited because, while they can be easily used to describe the diffusion of PM and

ISO 9000, the data indicates that quite different processes underpin both phenomena. This research identifies two distinct types of external change agents: *trendslators* and *fashion retailers*.

Trendslators are the certifying bodies, local project management associations, and academic units who play a key role in advocating, educating and promoting a management technology. The term is a direct nod to the sociology of translation, (Callon, 1986) and specifically to Latour's critique of the diffusion metaphor (Latour, 1986, 1987). For Latour, diffusion is an inappropriate metaphor because it suggests that an innovation has an inherent force driving its spread: "[T]he spread in time and space of anything — claims, orders, artifacts, goods — is in the hands of people; each of these people may act in different ways" (Latour, 1986: 267). Trendslation is a form of translation, which is an ongoing, material and meaningful process whereby claims are progressively transformed as proponents seek to enrol other actors, who may accept, reject or modify the claims based on their own interests. This is precisely what happens in a market. Innovations become embedded (or punctualised in Latour and Callon's language) once there is a perceived fit between the proponent's claims and the interests of the targeted audience. Moreover, in this embedding, there are always displacements since translation is never wholly faithful.

In relation to management technologies, the term trendslation is preferred to the more generic term translation. While translation is pervasive, some actors not only translate but also work hard to build a *movement* (as distinct from a fashion). Thus, trendslation emphasizes the agent's pivotal role in creating a movement, and it also explicitly recognizes that translation — as understood within the sociology of translation — is fundamental to the diffusion and trend-making process (Czarniawska-Joerges and Sevón, 2005).

Trendslators are centrally concerned with institution building and in creating a — not yet present — professional community that will prosper over the longer term and emulate longer-standing professions. Thus they either mimic or build linkages with other institutions,

especially academic units, and work hard at creating educational programs, research, newsletters, publications, public events, etc. Examples of trendslators are the quasi (or faux) professional project management associations based in each country, and new academic units engaged in teaching and researching the subject. A trendslator's work is done once the formal institutions are in place, at which point one can expect institutional isomorphism to become more prominent. For instance, accountancy is institutionalised to a higher degree than project management, in that it is a business function, academic discipline (with well-established departments in universities), and profession (a profession being characterized by prolonged training, formal qualifications, strict regulations on practice, a regulatory body or bodies with disciplinary powers, and some monopoly rights). At the other extreme, management consultancy firms are typically not understood as trendslators, unless they are centrally engaged in institution building. However, a business guru might be considered a trendslator if he or she adopts the role of a prophet or evangelist, seeking to lead a new *movement*.

Fashion retailers are similar to, but different from, trendslators. While trendslators construct institutions around a management technology, the fashion retailer is focused on selling a technology that, in the language of actor-network theory, has become 'blackboxed'. A good example of a fashion retailer is a management consultancy firm that enters and leaves the market as the management fashion moves through the stages of pre-boom, boom and bust (David and Strang, 2006). The difference between trendslators and fashion retailers is eschatological: the former do not envisage that the movement will end, while the latter understand that they are selling a fashion, which will run its course and, in time, be replaced by another fashion. The citation counts on project management and ISO 9000 (Figures 3(a) and (b)) illustrates the difference clearly. While ISO 9000 is best understood as a fashion (or perhaps a fad) — with the term featuring in the non-scholarly literature for only ten years — project management is more illustrative of a movement (within which a series of fashions might be discernible) with little difference in the citation count between 1984 and 2010.

While trendslators become powerful by building institutions, fashion retailers are by no means powerless. As Wolfe (1975) makes this clear in his acerbic study of fashion in the art world, a small clique or *cénacles* can set a fashion that, in turn, is taken up by the bohemian world, the art world, and ultimately *tout le monde*.

CONCLUSIONS

The conclusions from the research are as follows. First, the diffusion metaphor, with its epidemiological associations, provides an insufficient theoretical carapace for understanding the 'lumpy' take-up of such technologies across international borders. Instead, the translation metaphor is more appropriate in that it centralises translation agents, who, routinely, are constituted by and confined to international territories. Consequently, technologies are not necessarily adopted according to the S-curve model, even though this model is almost taken for granted in the technology diffusion literature (see Geroski (2000)). Not only do these technologies not necessarily follow the S-curve diffusion model, but the adoption of PM differs markedly from the adoption of ISO 9000, with the evidence indicating that countries appear to adopt one or the other but not both. This suggests that the spread and take-up of each of these technologies across the international landscape requires separate study.

Second, while neo-institutional theory is a central theoretical frame for understanding the diffusion of ISO 9000, it seems much less relevant for understanding the internationalization of project management. Instead, the research points to 'competitive isomorphism' as key to the internationalization process. (This finding can be attributed to the inductive methodology adopted, since a hypothetico-deductive approach would almost certainly not have arrived at this conclusion). The paper identified three primary processes of competitive isomorphism – competitive imitation, trendslators, and fashion retailers – through which organizations come to be similar to one another. It may be that competitive isomorphism is more important than institutional isomorphism in this case because, while project management is a discipline, it is not a profession, *per se*. Thus, it would be interesting to look at the internationalization of an

accounting technology, because here a *bona fide* profession does exist, and one would therefore expect institutional isomorphism to play more of a role. More broadly, the study brings attention to the inter-relationship between management technologies and institutions, which is something that has received scant attention in the literature.

Third, the inductive methodology led the study to focus on the quasi-professional (as distinct from professional) associations that are deeply implicated in the diffusion of these technologies and, more broadly, in the internationalization of management movements and fashions. There is certainly scope to study these entities in more depth, since they are largely overlooked within the literature. Together, they constitute a decentralized institution operating at the international level (e.g. IPMA), and again these do not feature very much in the literature, even though they clearly play an important role in global systems of production and exchange, in governing and promulgating management technologies, and in creating significant geographic distinctions across the economic landscape.

There are interesting policy implications arising from this research. New management practices can be important – not least in terms of attracting FDI – and therefore nations and state institutions (such as universities) are faced with a dilemma when a new fashion emerges. The state and/or its institutions can invest resources to support an emerging management fashion, by, for instance, assisting teaching, research and professional development, but this can be expensive if the fashion is short-lived. However, neither does the state nor its institutions wish to be tied to unfashionable practices, or to be perceived as unfashionable. Thus, the state and its agents must develop abilities, firstly, to recognise the emergence of management trends, secondly, to distinguish between longer-term movements and shorter-term fashions, and, thirdly, to create structures and processes that are sufficiently flexible to support and/or disengage from new business practices, especially through strategic engagement with (emergent) professional associations.

Management technologies are pervasive, politicised and pertinent, and so there is much scope for future research on their adoption. For instance, one might profitably focus on the anomalies and outliers identified in the analysis, through, in particular, detailed case studies of countries with unexpectedly high or low levels of adoption. Iceland is especially interesting because it is a small island with its own language, and it seems like an ideal place to study business imitation, which is quite difficult to study empirically. Finally, longitudinal studies could inquire into the temporal sequencing between FDI and the adoption of particular management technologies.

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Figure 1(a). PM Score plotted against national wealth (outliers retained).

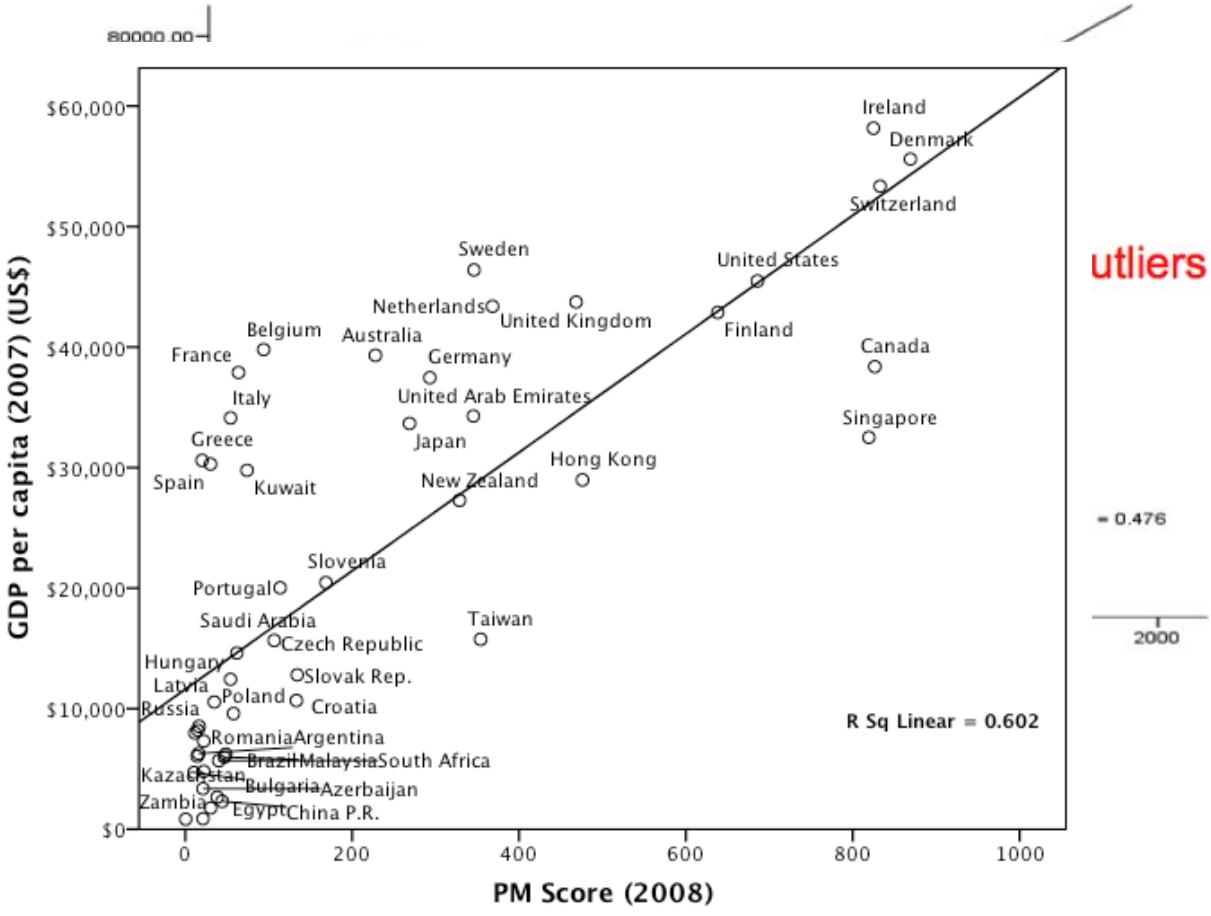

Figure 1(b). PM Score plotted against national wealth (outliers removed).

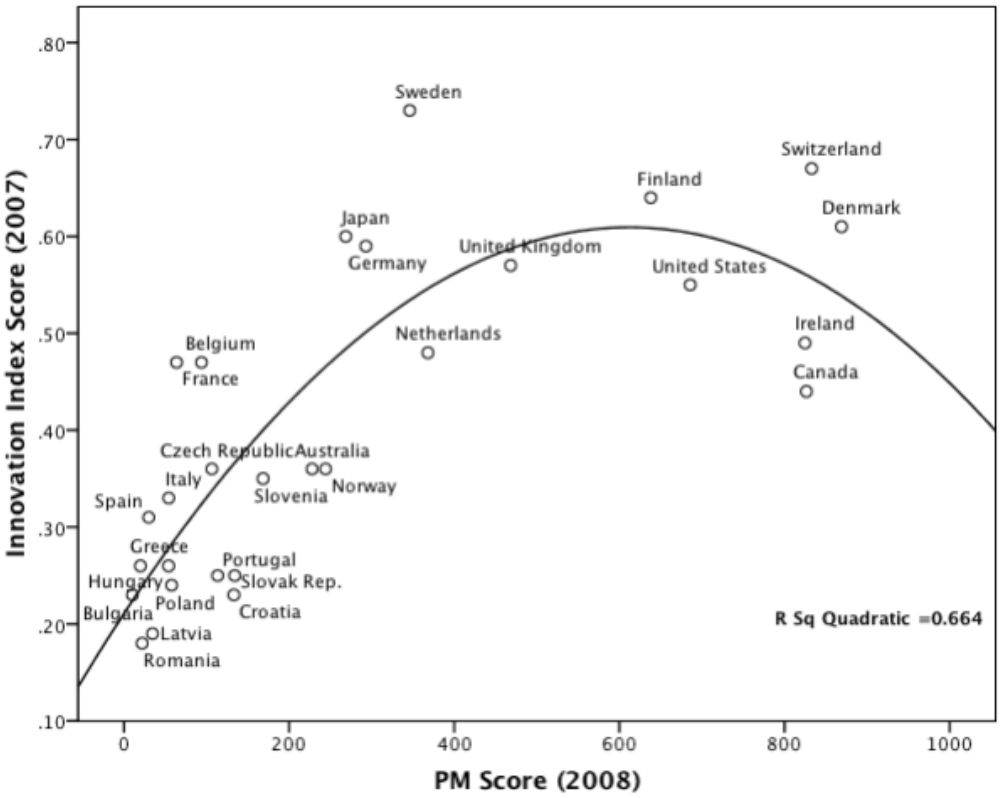

Figure 2(a) PM Score plotted against Innovation Index (outliers excluded)

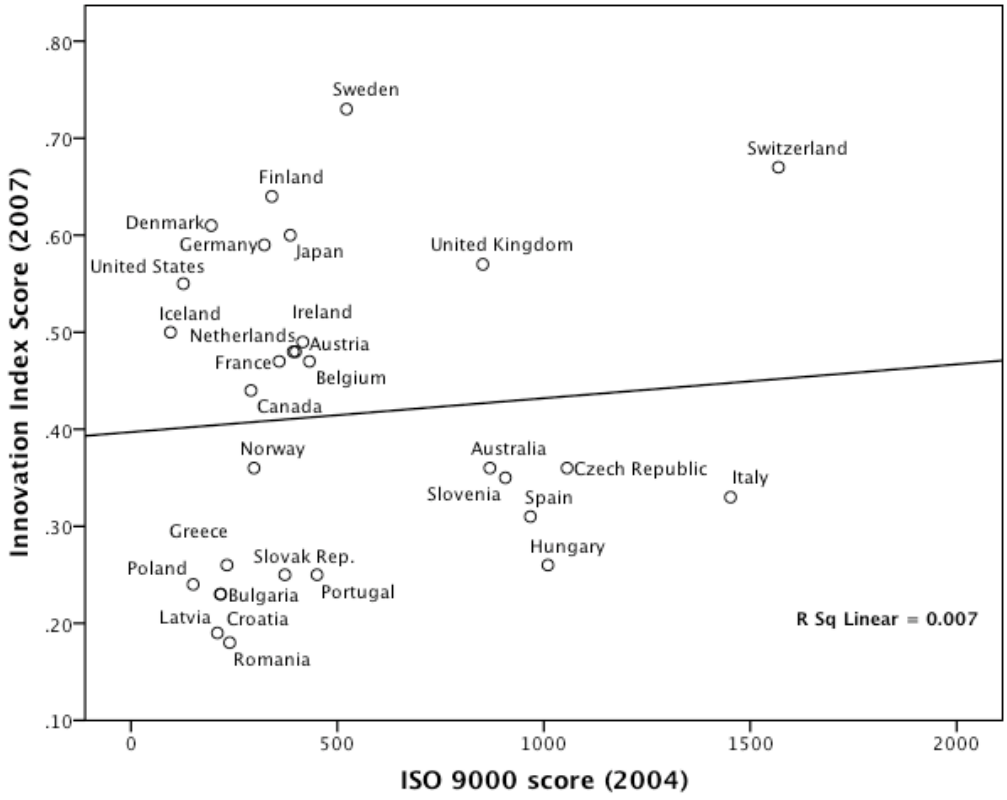

Figure 2(b) ISO 9000 Score plotted against Innovation Index

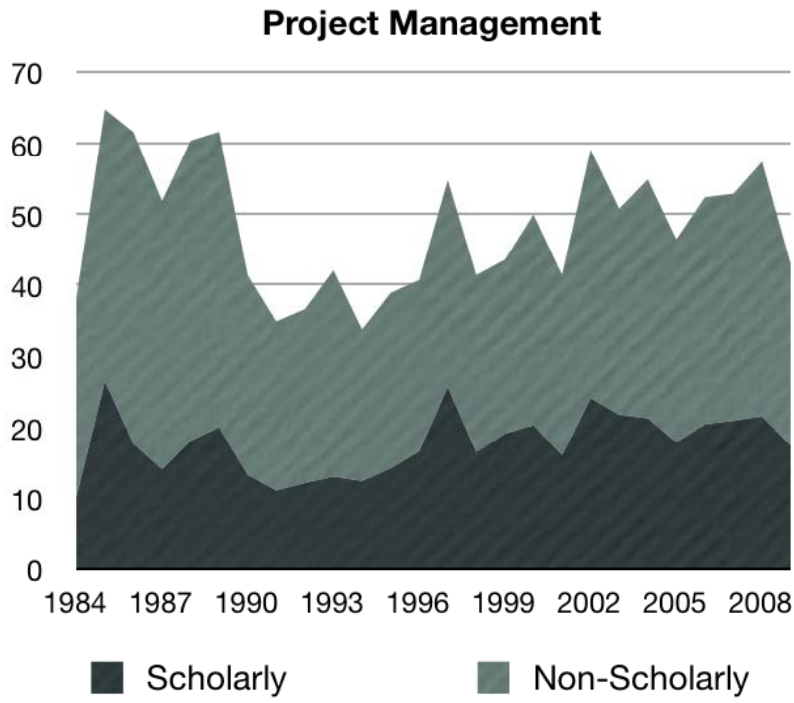

Figure 3(a) 'Project Management' Citation Count (Stacked: i.e. 10 scholarly and 28 non-scholarly in 1984).

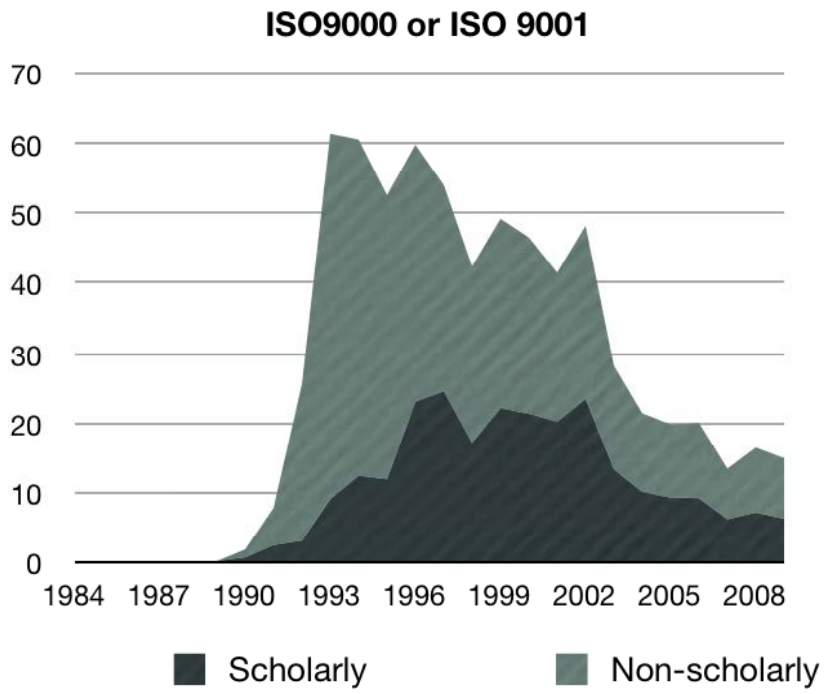

Figure 3(b) ‘ISO 9000’ Citation Count (stacked)

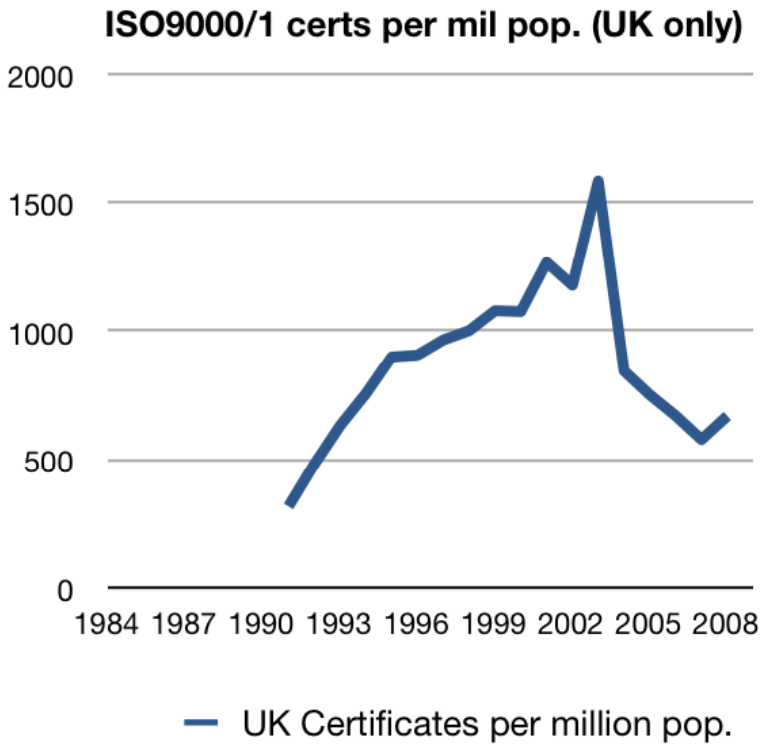

Figure 3(c) ISO 9000 Certificates per million population (UK only)

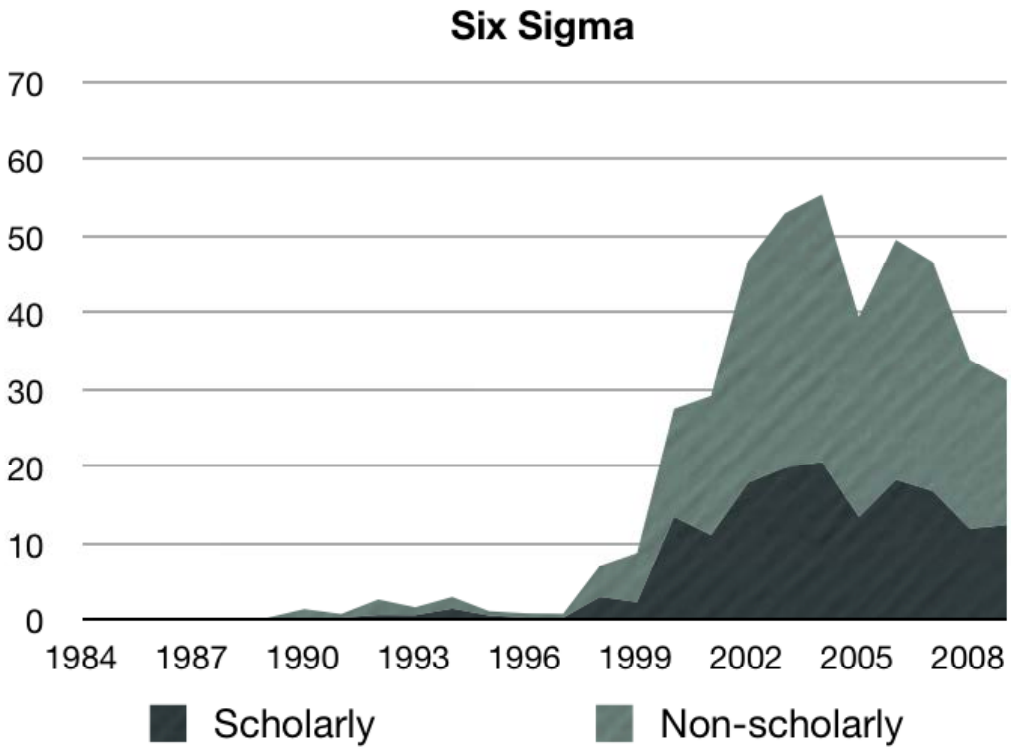

Figure 3(d) ‘Six Sigma’ Citation Count (stacked)

TABLE I:

Results of Cluster Analysis.

Cluster	Country	GDP per capita (2007 US$)	Innovation Score	ISO 900 Score	PM Score	PM/ISO9000 ratio
Switzerland	Switzerland	$53,352	0.67	1568	833	0.53
The PM enthusiasts	Austria	$42,126	0.48	399	1390	3.48
	Iceland	$58,185	0.50	96	1626	16.94
	Mean	*$50,156*	*0.49*	*248*	*1508*	*6.09*
High PM / Low ISO9000	Canada	$38,382	0.44	291	826	2.84
	Denmark	$55,603	0.61	194	869	4.48
	Finland	$42,877	0.64	341	638	1.87
	Ireland	$58,168	0.49	416	825	1.98
	Norway	$74,848	0.36	298	244	0.82
	United States	$45,490	0.55	127	686	5.40
	Mean	*$52,561*	*0.52*	*278*	*681*	*2.45*
High ISO9000/ Low PM	Belgium	$39,798	0.47	432	94	0.22
	France	$37,899	0.47	359	64	0.18
	Germany	$37,461	0.59	323	293	0.91
	Japan	$33,668	0.60	386	269	0.70
	Netherlands	$43,386	0.48	393	368	0.94
	Sweden	$46,400	0.73	522	346	0.66
	United Kingdom	$43,735	0.57	852	468	0.55
	Mean	*$40,335*	*0.56*	*467*	*272*	*0.58*
The ISO 9000 enthusiasts	Australia	$39,319	0.36	869	228	0.26
	Czech Republic	$15,661	0.36	1056	106	0.10
	Hungary	$12,433	0.26	1010	54	0.05
	Italy	$34,120	0.33	1452	54	0.04
	Slovenia	$20,465	0.35	907	168	0.19
	Spain	$30,289	0.31	968	30	0.03
	Mean	*$25,381*	*0.33*	*1044*	*107*	*0.10*
The poor relations	Bulgaria	$4,704	0.23	217	10	0.05
	Croatia	$10,675	0.23	218	133	0.61
	Greece	$30,603	0.26	232	20	0.09
	Latvia	$10,555	0.19	209	35	0.17
	Poland	$9,594	0.24	151	58	0.38
	Portugal	$20,029	0.25	451	114	0.25
	Romania	$7,310	0.18	239	22	0.09
	Slovak Rep.	$12,802	0.25	373	134	0.36
	Mean	*$13,284*	*0.23*	*261*	*66*	*0.25*