

Measuring Industry Managerial Discretion: A Comparative Study in the UK.

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Abstract

Purpose: The theory of managerial discretion and the direct insights it provides in our understanding of the varying impact strategic and operational actions have on organizational change and business fortunes, is an area of research potential underexplored in the UK. This study seeks to establish whether the measurement of managerial discretion is constant between the two similar societal corporate frameworks of the UK and USA listed markets.

Design/Methodology/Approach: The extant managerial discretion ranking model, established in the USA, is empirically assessed for its validity and effectiveness across a sample of high and low discretion companies from the FTSE 350.

Findings: Using accounting measures, a clear and significant difference is established between UK high and low managerial discretion entities. The results prove to be significant in enabling the differential comparative analysis of the institutional characteristics of corporates.

Originality: To the best of the authors' knowledge, no study of this nature has been conducted previously in the UK context. Whilst the original model developed in the USA is now several decades old, the UK results reflect similar industry rankings as found originally in the USA, subject to some differences considered to be a result of the changing nature of global business since the 1990s. This study opens a new seam of novel research, which has the potential to uncover, at a granular level, the differential mores and character of management ethics, styles and practices in such issues as organizational change, corporate culture, governance, and social responsibility.

Keywords

institutional theory, industry constraints, isomorphism, managerial discretion, SIC classification.

Introduction

The concept of managerial discretion was introduced as a way of evaluating the gap between the discretion available to top management executives and their ultimate influence on organizational outcomes. An empirical evaluation of industry discretion was conducted by Finkelstein and Hambrick (1990) using qualitative assessments premised upon canvassed consensus views of security analysts and academicians.

With a view to improving the validity and reliability of the measures of managerial discretion across industries, Hambrick and Abrahamson (1995) tested for certain distinguishing objective characteristics. They did this, in a study of the US market, by focusing strictly on the external or task environment – specifically an industry, noted as the broadest and arguably the most fundamental source of discretion (Hambrick and Finkelstein, 1987). Based on the measurement of several objective industry characteristics, Hambrick and Abrahamson (1995) found that companies can be categorized as either belonging to a high discretion industry or a low discretion industry. For organizations in a high discretion industry, the locus of control is internalized and at the discretion of the top management. Conversely, where the locus of control is at the discretion of the external environment or forces outside the domain of organizations, such organizations are classified as belonging to a low discretion industry.

In subsequent studies, scholars have adopted the empirically validated objective industry characteristics for measuring industry discretion as established by Hambrick and Abrahamson (1995), to evaluate attentional homogeneity in industries (Abrahamson and Hambrick, 1997); the commitment of Chief Executive Officers (CEOs) to the status quo (McClelland *et al.*, 2010); and an empirical review of managerial discretion and focus on future research directions (Wangrow *et al.*, 2015). Despite the number of studies that have advanced the concept of managerial discretion in different contexts, there would seem to be no published work on assessing the predictive efficacy of the underlying model developed in Hambrick and Abrahamson (1995) in the context of companies operating in other corporate geographic

spheres. Specifically, the empirical review in Wangrow *et al.* (2015) concluded by setting out the need to assess the predictive viability of the model for measuring managerial discretion in different firms, industries, and countries, using previously tested measures of managerial discretion and in accordance with previous construct validation studies. This research study is directed to that end.

Accordingly, by drawing and evaluating insights from research in the domain of discretion originally conducted by Hambrick and Abrahamson (1995) in the United States of America (the USA or the US), this study tests whether the underlying predictive model for differentiating between industries, in the context of the discretion afforded to them, can be replicated, tested, validated, and compared with companies operating in the alternate domain of the United Kingdom (the UK). Therefore, the question this research aims to answer is to evaluate whether the model for measuring the overall industry discretion can be used to correctly classify companies in the UK as either belonging to a high discretion industry or a low discretion industry, in line with the results presented for companies in the USA.

The rationale for the selection of the UK was its similarity in a variety of significant respects with the USA, which directly affect managerial discretion. The UK and USA are structurally similar at a macro level. Looking at the data from the Office for National Statistics (2021) in the UK and the Bureau of Economic Analysis (2021) in the USA, both countries have service sector economies which represent the greater proportion of economic activity. Both countries work within a common law system, as well as a similar legal framework for contract law. In addition, both are relatively free market economies, with strong financial markets operating globally and similar financial reporting regulations. If the American managerial discretion model developed by Hambrick and Abrahamson (1995) is operationalizable, in the UK listed market, it would signpost the wider validity of the model and enable incremental development and refinement of the model going forward. Prior research by Crossland and Hambrick (2011), evaluated by comparative analysis at a country level, 15 countries including the UK and particularly focused on the interaction of managerial discretion and Hofstede's (2001) cultural values. This current study will take a

more granular approach to evaluate the effectiveness of the seminal model in Hambrick and Abrahamson (1995) to test its empirical viability within the UK market.

Hence, by relying on the theoretical evaluations of Hambrick and Finkelstein (1987) and the empirical investigations of Hambrick and Abrahamson (1995), this study seeks to make an analytic and empirical contribution to assist future research on industry discretion in a number of ways. Firstly, the work replicates the previous studies on industry discretion by Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) by testing for the objective industry characteristics verified in those studies using companies in the UK. Secondly, although the study of differential managerial discretion across industries is theoretically important, more importantly it is potentially a gateway study which will help in establishing, validating, and opening up for more granular research other organizational phenomena. For example, the evaluation of the logic that influences different organizations; the comparison of leaders across contexts, culture, and time; the evaluation of corporate culture and its impact, practices in corporate governance, trends in corporate social responsibility, discretionary top executive compensation, incidence and usage patterns of discretionary accruals, levels of earnings management, financial statement fraud, and in the evaluation of the financial communications of organizations in different industries. Such research has, to an extent, been inhibited or stifled by the lack of a differential *ceteris paribus* type measure. This work sets out a methodological start point for companies sharing similar financial context and legal and regulatory environments.

Following an explanation of the conceptual causal theories and primary empirical literature, hypotheses development, sample and methodology and results analysis, the implications of the findings are discussed and proposals for future research directions are suggested.

Theoretical Background

Institutional Theory

In recent times, the concept of managerial discretion has primarily been premised and articulated through institutional theory. Institutions have been defined as “a system of norms that regulate the relations of individuals to each other” (Parsons, 1990, p. 327), which also defines expectations as to the modality of such relations (Scott, 2014). According to Greenwood *et al.* (2013), organizations can either be regulated by the logic internal to each organization, or by that imposed by the external environment. From the perspective of the external environment regulating the logic that guides the behaviors of organizations, Boxenbaum and Jonsson (2013) posit that organizations become similar or isomorphic in their behavioral pattern. Consequently, as organizations interact over time, they develop certain isomorphic traits which creates an institutional logic that regulates the behavior of the organizations affiliated to such institutions.

The logic that regulates an institution shapes the rational behaviors of the actors within individual organizations to the extent that they become loosely coupled with their technical core (Meyer and Rowan, 1977). According to Meyer and Rowan (1977), organizations ensure they conform to the logic imposed on them from their external environment because of the need to maintain the legitimacy of their operations. Therefore, the values and beliefs shared by organizations within an institutional environment results in an isomorphic situation, where organizations have similar identities and operate in similar forms. Similarly, the insights from Hambrick and Finkelstein’s (1987) discretion theory serve the purpose of explicating and differentiating between the logics of different industries.

As noted, an important debate among theorists is the argument whether the distinction between the determinants of organizational outcomes is a function of strategic choice or environmental selection. To establish a common ground between these two conflicting standpoints, Hambrick and Finkelstein (1987) proposed two arguments. On the one hand, they argue that top executives have significant differences in the amount of discretion, or latitude of action they are afforded in influencing organizational outcomes.

In tandem with this, they also argue that the level of discretion possessed by top executives varies widely from industry to industry, based on the institutional logic predominant in those industries. Therefore, they argue that the degree of managerial discretion is not a function of random events, but rather a product of specifiable and objective industry determinants which are tempered by organizational and individual-level factors.

In the seminal work of Hambrick and Finkelstein (1987), they argue that tripartite level factors affect managerial discretion – the industry-, organizational-, and individual-level factors. From the industry level they propose that the determinants at this level of analysis influence the entire amount of discretion afforded managers in an industry. In view of this, the deviation by top executives from the industry discretion is a function of individual-level determinants, which stems from the cognitive complexity of the top executives or political acumen; as well as disparate firm determinants, such as the size of the organization, availability of resources, or even age. As aforementioned, discretion is not absolute (Hambrick and Finkelstein, 1987), hence, industry and organizational factors are capable of greatly influencing or shaping a manager's level of discretion. In other words, discretion is also partly resident in the cognitive capacity of a top executive (Abrahamson and Hambrick, 1997). From the work of Hambrick and Finkelstein (1987), six industry-level factors that influence industry-level discretion were noted, which were further categorized into two segments. From the first segment, the determinants are quasi-legal constraints, powerful external forces, and industry structure (Abrahamson and Hambrick, 1997, p. 515). These are considered to influence managerial discretion and are enforced through powerful stakeholders. Quasi-legal constraints are characterized by Abrahamson and Hambrick, (1997) by explaining that the level of discretion possessed by top executives is restricted by an array of governmental actors such as the courts, regulators, or state legislators. Similarly, the influence of powerful external stakeholders such as suppliers and customers can also limit the discretion of managers. Consequently, the more the power exercised by the regulatory environment, the less the industry-level latitude of action afforded the top executives of an industry. For the industry structure, it is thought that the limited competition in

oligopolistic industries enhances the awareness and responsiveness of powerful competitors to each other's strategic choices, thereby limiting discretion. Conversely, there is less confinement in fragmented industries, thereby affording the executives of those firms more freedom to act, leading to a relatively higher discretion and latitude.

Within the second segment of industry-level determinants, the factors affecting industry-level discretion are product differentiability, market growth, and demand instability (Abrahamson and Hambrick, 1997). These determinants influence industry-level discretion through the instrumentality of ambiguity in means-ends relations (Hambrick and Finkelstein, 1987). Accordingly, the higher the level of ambiguity, the more the likelihood for top executives to explore a wide variety of attempted means to achieve these various ends (Barnard, 1968; Thompson, 1967). Simply put, the greater the likelihood for industry conditions to cause ambiguity or lack of clarity in unusual circumstances, the more the number of alternative actions afforded to top executives in an industry and the greater the latitude of action in the selection of alternatives unknown to the stakeholders (Abrahamson and Hambrick, 1997, p. 515).

In this context, the literature on Institutional Isomorphism posits the concept to be a situation where organizations have similar identity and operate in similar forms. It is an array of processes in which an organization develops the conscious necessity to be like other firms in the same industry sector (Hambrick *et al.*, 2004). Consequently, in the quest for legitimacy in both the existence and operations of organizations, individual firms must align themselves with the requirements of the external environment, which by implication coerced parts of organizations to be loosely coupled with the central logic for which they were established. Interestingly, this view aligns with the studies by Wangrow *et al.* (2015) and McClelland *et al.* (2010) where they reinforce the idea that the level of discretion afforded to organizations can determine the level of isomorphic pressure they face, to act either in a prescribed or proscribed manner. This isomorphic pressure determines the direction of the responses of the organizations to the external stimuli.

Abrahamson and Hambrick (1997) posit that industries differ in how homogenous or heterogeneous they are with respect to the cognitions and behaviors of their top management teams. Their study, based on the concept of discretion, argues that the lesser the level of discretion afforded to organizations in an industry, the more the similarity or homogeneity in their attention patterns. In contrast, the more the level of discretion afforded to organizations in an industry classification, the more varied or heterogeneous their attention patterns will be (p. 513). However, it was established, from prior research, that the members of top management in organizations classified within the same industry often do share a similar logic about their organizations and environments (Abrahamson and Fombrun, 1994; Hambrick, 1982; Huff, 1982, 1990; Porac *et al.*, 1989; Reger and Huff, 1993; Spender, 1989; Walsh, 1995). Consequently, the responses of top managers within the same industry become more homogenous or isomorphic, (Abrahamson and Hambrick, 1997), although the critical level of homogeneity or isomorphism of such responses is also dependent on the level of discretion afforded in the industry category (Wangrow *et al.*, 2015; McClelland *et al.*, 2010).

As noted, Hambrick and Finkelstein (1987) contend that industry-, organizational-, and individual-level factors affect managerial discretion. The determinants at the industry-level affect the general amount of discretionary action that will be afforded to managers in an industry – referred to as industry-level discretion. Subsequently, the determinants at the individual level, such as the psychological traits (Wangrow *et al.*, 2015), the cognitive complexity or political acumen (Abrahamson and Hambrick, 1997) of a manager, as well as different organizational determinants, determine the degree to which a manager deviates from the industry tendency. Nevertheless, discretion is not absolute (Hambrick and Finkelstein, 1987), and, although the industry and organizational factors may greatly influence a manager's discretion, as conditioned by the social and cultural context of institutional theory and isomorphic practice, a manager's latitude of action also depends on the personal psychological traits of the manager.

Empirical Background

It can be seen from the theoretical literature that the concept of managerial discretion impacts, to a considerable degree, upon many areas of corporate decision making. This is further evidenced in recent empirical literature.

Managerial Discretion (MD) measurement is used in corporate governance research to consider the latitude of action enabling the freedom in decision making of senior executives. It is suggested that this links critically with the underpinning agency and resource dependency theories (Haj Youssef and Teng, 2019). The work by Haj Youssef and Teng (2019) goes on to address the criticism of the use of MD in corporate governance research by Andersen (2017), and formidably deconstructs the arguments to underline and reinforce the necessity of using MD in this arena.

One recent example of a MD influence being applied in the corporate governance sphere, is the evaluative study considering the effect of both trickle down and queen bee effects on gender diversity in the board room (Corwin *et al.*, 2022). This study discusses the moderating impact of MD but limits this to environmental munificence, premised upon sales growth in the last five years. They suggest that environmental munificence measures the external discretion considerations on the availability of resources. The study conducted a sequence of tests on the S&P 1500 companies. The results indicate that environmental munificence has a positive effect when combined with the women CEO variable on the gender diversity decision and is significant at the 1% level.

As an adjunct of the corporate governance debate the question of CEO compensation has been considered in the context of the mediating impact of MD by Baixauli-Soler *et al.* (2021) who point to the fact that the empirical literature underscores the critical relationship of a strong positive relationship between senior executive compensation and levels of MD. For their own study on the UK market, they employ some of the features of the Hambrick and Abrahamson (HA) model within their assessment of what they term as organizational discretion. Namely, capital intensity related to property plant and equipment (PPE) and employees, resource availability which is the ratio of research and development

(R&D) expenditure to sales revenue, and ownership structure being a Herfindahl index of the four largest shareholders. It is notable that a major part of this variable is aligned with the HA model elements and is significant at the 1% level reflecting a positive impact on executive pay.

A study tangential to the work on CEO compensation evaluated the grant of stock options to CEOs in the USA (Quigley *et al.*, 2020) and considered the impact of CEO market communications during the pre-grant period, moderated by MD. The measure used for MD was the HA model without the advertising measure element, but with the addition of an industry concentration ratio. The results of the study on the negative press releases prior to grant, reflected significance at the 1% level for the MD variable.

Recent research on the use of integrated reporting again assesses the impact of MD on the corporate decision regarding implementation, Garcia-Sánchez *et al.* (2019). In their work they take a restricted view of MD by measuring it using a measure of potential earnings management, through the Modified Jones model. Potentially a wider view of the MD effect also using the HA model may provide a more nuanced result.

In financial markets research MD is being considered for its impact on firm value. Gupta *et al.* (2018) evaluate the impact of entrepreneurial orientation on Tobin's Q through MD. They conduct the analysis on five countries and use organizational, industry and national MD variables in the regression models. The variables did not show significance in the regressions. However, some significance at the $p < 10\%$ level was reflected for the combined interaction variables of entrepreneurial orientation and MD. The resultant overall low level of significance from the MD perspective however, could result from applying the HA model to the non Anglo-Saxon model firms in Germany.

A further study carried out tests on the S&P 500 to consider the moderating impact of MD on entrepreneurial orientation (Wang *et al.*, 2021). The research used the primary elements of the HA model to measure MD, namely the industry growth in sales over a five year period, characterised as munificence, the industry capital intensity, and product differentiability measured by R&D intensity. In addition, they

added market concentration and aggregated the results to produce a measure of MD. The aim of the study was to consider the impact of entrepreneurial orientation on firms' strategic change. The results reflected a high significance for the MD variable.

Further research on MD and market values, in this case stock returns, has been conducted by Papanastasopoulos and Thomakos (2017). Within their study they incorporated measures of country level MD none of which relate to any of the HA model variables.

The link between MD and managerial ability has been considered through the lens of the fundamental analysis of cash holdings in US companies (Magerakis, 2022). A number of MD measures are applied which are nominally linked to the HA model but are in fact differential in structure and application. Whilst some elements are linked to the constituent features of the HA model, they are not sufficiently aligned to be termed synonymous. Six ratios including research and development over sales, change in total revenue (growth), PPE deflated by total assets, employees to sales, selling, general and administrative expenses to sales, and the standard deviation of the number of employees were employed in the study.

It is evident therefore that a single consistent model, that can be employed across a variety of research areas is needed. The critical differential with the HA model is that it is borne from the original qualitative study (Finkelstein and Hambrick, 1990) which captured the informed views of both academics and security analysts on industry MD. This was then combined with the corporate financial variables which it was believed were the drivers for the differentiation in MD, (Hambrick and Abrahamson, 1995). This mixed methods approach has enabled a strong relationship between both professional practice and specific theoretical constructs and thereby an enhanced epistemology. It is this which creates an abiding support foundation for the model's wider application.

It is apparent from both the primary theoretical studies and the empirical research on managerial discretion and its impact on a variety of critical issues in corporate decision making, that corporate managers are dependent on the particular external environment, for the level of discretion they can

employ. Much of this results from such issues as the isomorphic nature of practices developed in highly regulated or oligopolistic industries and the impact of resource dependency. It can be seen from the empirical literature considered that the level of managerial discretion is measured in a number of ways. These practices or mores of conducting business are measured through the seminal work carried out by Hambrick and Abrahamson.

The Measurement of Industry-Level Discretion and Empirical Framework

In the quest to introduce a rating system for discretion across industries, Finkelstein and Hambrick (1990) adopted a number of metrics which were assessed qualitatively to rank high-, medium-, and low-discretion industries. They established computer programming and software companies, chemicals, and natural gas distribution companies as high-, medium-, and low-discretion companies, respectively (Abrahamson and Hambrick, 1997, p. 531). It is noteworthy that using a qualitative measure in any research has the potential to be limiting, owing to the presence of subjectivity in the mind of an observer. However, it is emphasized by Abrahamson and Hambrick (1997), that the use of a qualitative approach, although limiting, provides researchers with a reliable measure of discretion in industries that have clarity in their degree of discretion. In other words, this approach is reliable where all industry determinants “point to essentially the same conclusion” (p. 518). By contrast, it is difficult to use a qualitative approach to measure discretion in less polarized industries or in industries where the determinants of discretion do not clearly align. In addition, this raises the concern on the dependability of such an approach. As a norm, there is an inherent requirement for qualitative assessments to demand a significant element of interpretation and differentiating judgment, because of the expectation that the qualitative measurement of an industry’s latitude of action by one researcher can be entirely different from those of other researchers.

To mitigate these potential obstacles, the current study adopted the measurement of discretion at the industry-level as determined in Hambrick and Abrahamson (1995). In their work, they measured industry-level discretion by obtaining the ratings of scholars in strategy and organization theory, which were independently corroborated with the ratings of security analysts in a major investment bank. These ratings were then applied as the dependent variable in an OLS regression, to establish and measure the unique company financial characteristics of discretion ratings activity, as the independent variables. Although it is arguable that the effectiveness of the model is diluted by the fact that the measurement approach was established over two decades ago. However, it was replicated in the studies of Hambrick and Quigley (2014) and, McClelland *et al.* (2010) to further lend construct validity and reliability to the qualitative assessment of discretion. The formula for measuring industry discretion (Hambrick and Abrahamson, 1995, p.1437) is given as:

$$\begin{aligned} \text{Industry discretion} = & 4.344 + (12.090 \times R\&D \text{ Intensity}) + (15.186 \times Advertising \text{ Intensity}) \\ & - (0.004 \times Capital \text{ Intensity}) + (5.960 \times Sales \text{ Growth Rate}). \end{aligned} \quad (1)$$

The resultant discretion score rankings are shown in Table I, where there is clear differentiation at the industry level.

Insert Table I here

One area that the Hambrick and Abrahamson (1995) study endeavored to incorporate within the model, was that of a measure for regulation, or what they term as quasi legal constraint. Their method of measuring this variable was to use content analysis on shareholder letters. They recognize the experimental nature of this approach and given the lack of significant results using this measure, they exclude it from the final model. As mooted by Hambrick and Abrahamson this current study has given

this area some thought and after considering the current model, it is suggested that the model already includes some features of regulatory impact.

The reason for this is that increased regulation for industry will, moderate and reduce the perceived investment risk for investors and consequently the required rate of return from a shareholder's investment. The converse case will apply where no regulation impacts upon an industry, where investors will require higher returns on their investment as compensation for increased risk. Turning to the generator of growth in a company, this is usually characterized as a function of internal investment and rate of return (see for example Damodaran, 2012). Given the lower rate of return necessary in a low discretion industry, growth will be on a lower scale than a high discretion industry where returns should be higher. Internal investment can be measured as a composite of R&D and capital intensity, both of which are measures in the current managerial discretion model, along with sales growth.

Therefore, it is contended here that embedded within the Hambrick and Abrahamson variables unseen, are elements of regulatory impact.

Managerial Discretion Hypothesis Development

As noted, the research focus of this study is to assess the efficacy of the proposed managerial discretion measurement model across industries in the UK, with the view of cross matching and comparing the results established for a number of industries in the USA with those sampled in this study. For the purpose of adopting, replicating, validating, and comparing the results established for industries in the USA, a similar process was followed, as in the statement of the hypotheses used in Hambrick and Abrahamson (1995). Specifically, the three (3) measurement scales adopted in Hambrick and Abrahamson (1995) are product differentiability (research and development intensity, and advertising intensity), capital intensity, and market growth rate. These measurement scales are used in the statement of the hypotheses as follows:

a. Product Differentiability: Previous studies have used two scales for measuring product differentiability, namely research and development intensity (R&D Intensity) and advertising intensity. These two measures have been generally used by industrial economists as primary measures of differentiability (Hay and Morris, 1979; Scherer, 1980). R&D Intensity reflects differentiability in tangible product features, while Advertising Intensity reflects differentiability in intangible image and positioning. Although both are complementary indicators of product differentiability, they are not necessarily correlated with each other (Hambrick and Abrahamson, 1995, pp. 1433-1434). The findings of Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) show that for both R&D Intensity and Advertising Intensity, the coefficients of the two measurement scales are significantly higher for companies in a high discretion industry than for those in a low discretion industry.

b. Market Growth: Industries that experience high growth are typified by “unprogrammed decision making, competitive variation, and poorly understood means-ends linkages” (Hambrick and Abrahamson, 1995, p. 1429). The study by Lieberman and O’Connor (1972) found that the growth rate of an industry is associated with the influence of managers over profit margins. Accordingly, the results of previous studies show that companies in a high discretion industry group have a significantly higher market/sales growth rate than those in a low discretion industry group.

c. Capital Intensity: Although Hambrick and Finkelstein (1987) discussed capital intensity as an organizational-level determinant of managerial discretion, Hay and Morris (1979) posit that it is primarily an industry factor. It follows that as a primary determinant of discretion, high levels of capital intensity promotes strategic rigidity and hinders firms from committing to short-term courses of action (Ghemawat, 1991; Hambrick and Abrahamson, 1995, p. 1430; Hannan and Freeman, 1977). In the same vein, results from previous studies show that this measurement scale is significantly higher for companies in a low discretion industry group than for those in a high discretion industry group (Hambrick and Abrahamson, 1995; McClelland *et al.*, 2010).

d. Overall Industry Discretion: As emphasized by Hambrick and Finkelstein (1987), the forces of all the independent measurement scales detailed operate together in influencing the amount of discretion in an industry group. Similarly, the results of previous studies show that this overall measurement scale is significantly higher for companies in a high discretion industry group than for those in a low discretion industry group (Hambrick and Abrahamson, 1995; McClelland *et al.*, 2010).

Consequently, the primary hypothesis can be expressed as:

H1: The comparative discretion scores resulting from the analysis of the UK sample, will result in the same categorization of low and high managerial discretion industry sectors, as determined in the prior studies in the USA. This will be further characterized by a statistically significant difference between the low and high industry sector measures.

To delineate industry statistics the USA implemented a Standard Industrial Classification (SIC) system in 1937. This system is employed in the study by Hambrick and Abrahamson (1995) as the basis for the collection of financial data, relating to the listed companies in their sample. It is also applied in the current study. The source of data used for this study, Standard and Poor's S&P Capital IQ, provide USA SIC classifications for UK companies. The SIC system developed and applied in the USA is a hierarchical top-down structure whereby the first digit represents a high-level industry characteristic, such as Agriculture (0), Mining/Construction (1), Manufacturing (2/3) etc. and each additional digit enables the industry focus to specialize. This is best explained in an example using a SIC code within the current study, that of 2834. This denotes companies operating in the pharmaceutical manufacturing sphere. The first digit of 2 denotes Manufacturing and each additional digit produces an increasingly granular deeper analysis viz.

2xxx – Manufacturing

28xx – Chemicals and allied products

283x – Drugs

2834 – Pharmaceutical preparations

Other fourth level digits in the 283x class of Drugs manufacture are Medical Chemical and Botanical products (3), In Vitro and In Vivo Diagnostic Substances (5) and Biological Products except Diagnostic Substances (6). Therefore, as in the case of this study using the higher-level code of 2830 instead of the more specific 2834, does not include extremely dissimilar companies.

This classification by a pyramid structure enables a greater use of sub classifiers at each additional level. This means that within the study where there is no direct comparable four digit SIC data sample a higher level SIC can be used as a proxy to good effect. As a result, the secondary hypothesis for the study is:

H2: The measured use, where necessary, of consolidated SIC sample companies will not change the expected resultant categorization of low or high managerial discretion and its statistical validity.

Sample and Research Approach

Of particular importance to this study is the adoption of the industry level of analysis of discretion in evaluating the predictive viability of the model for measuring managerial discretion across industries, using previously tested measures of managerial discretion and in accordance with prior construct validation studies. This is done to corroborate the thematic literature on managerial discretion with the industry level analysis on discretion, for the purpose of facilitating the comparative analysis of the results of this study with those of previous studies.

The relevant data, for the study, were collected from companies that met the selection criteria to test the predictive model for calculating the overall industry discretion scores for companies in the UK. As explained previously, the predictive model adopted and applied here was a pioneer model empirically tested in the US for differentiating between high and low discretion industries. Hence, for the purpose of ensuring the reliability and validity of the model in the UK context, relevant data on UK companies were

collected and tested. To do this, as noted above a firm's primary four-digit Standard Industrial Classification (SIC) code was adopted as an identifier of industry affiliation. Accordingly, the overarching aim of testing for the predictive efficacy of the underlying model was to assess whether firms registered and listed in the UK environment will have the same or similar levels of discretion polarity as those of their counterparts in the US.

In the context of this study, the classification of firms into high discretion and low discretion industries was based on reproducing the selection procedure of companies. The companies were selected using similar four-digit Standard Industrial Classification (SIC) codes used in Hambrick and Abrahamson (1995). In the context of this study, because of the reduced number of exchange listed companies in the UK, in comparison to those in the USA, some of the SIC codes matched to the Hambrick and Abrahamson (1995) study were taken at the broader third digit level which encompassed a wider spectrum of companies in similar overlapping or contiguous industries. For example, SIC 2834 Pharmaceutical Preparations is broadened to SIC 2830 Drugs, nonetheless, they produced similar classification of firms as those in Hambrick and Abrahamson (1995). In view of this, the companies selected for this study were those with SIC codes and listed in the FTSE 350 companies index (reported as active only in the focal industry) in the Standard and Poor's Capital IQ database for the period 2012-2016. The rationale for choosing FTSE 350 companies – an index made up of the constituents of the FTSE 100 and FTSE 250 -, is based on the convention that the FTSE 350 Index represents large and mid-cap stocks that are traded on the London Stock Exchange (LSE), which are considered to pass screening for size and liquidity (Russell, 2019). This screening process, as Table II shows, captured a diverse group of industries, with a combination of young and old, consumer- and industrial- product, manufacturing, and service industries. Accordingly, the data collected for all the companies that met the selection criteria are the details of the four objective indicators established in Hambrick and Abrahamson (1995). These indicators were used in establishing the regression equation for measuring industry discretion, shown in Formula 1.

As stated above, the objective indicators are Research and Development (R&D) Intensity, Advertising Intensity, Capital Intensity, and Market Growth (also known as Annual Sales Growth Rate). Specifically, the data collected for measuring Research and Development (R&D) Intensity were a firm's annual Research and Development Expenses and Sales figures. Accordingly, R&D Intensity was measured as $[(R\&D \text{ Expenses} \div \text{Sales}) \times 100]$. Second, the data collected for measuring Advertising Intensity were a firm's annual Advertising Expenses and Sales figures. Accordingly, Advertising Intensity was measured as $[(Advertising \text{ Expenses} \div \text{Sales}) \times 100]$. Third, the data collected for measuring Capital Intensity were a firm's annual Net Value of Property, Plant, and Equipment (PPE) and Number of Employees. Accordingly, Capital Intensity was measured as $[\text{Net Value of Property, Plant, and Equipment} \div \text{Number of Employees}]$. Lastly, the data collected for measuring Market Growth was Average Annual Sales Growth Rate (reported as a percentage) of each firm in all the industries. Accordingly, Market Growth was measured as $[(Y_1 \text{ Sales} - Y_0 \text{ Sales}) \div Y_0 \text{ Sales}]$. All data collected for calculating the overall industry discretion score covered the relevant periods 2012-2016. Specifically, the number of companies in the low discretion industries that met the predefined selection criteria was 37, while there were 49 companies in the high discretion industries. Consequently, the average number of Standard and Poor's Capital IQ firms in either high or low discretion industry was 43. This resulted in observations for 430 firm years.

Insert Table II here

Results and Evaluation

In the course of testing the applicability of the theory on managerial discretion in the UK context, the study adopted and reproduced the method empirically established in Hambrick and Abrahamson (1995). In their study, they showed that four objective indicators are associated with the individual corporate ratings provided by expert analysts on the level of discretion in an industry. The results of their empirical research

showed that research and development (R&D) intensity, advertising intensity, and market growth are all positively associated, while capital intensity is negatively associated with the ratings of experts on industry discretion. As a result, they established a linear equation for measuring industry discretion with deterministic regression coefficients of these four objective indicators of industry discretion.

The overarching aim of testing for the predictive viability of the underlying model is to assess whether firms registered in the UK environment will have the same or similar levels of discretion as those of their counterparts in the United States of America. In the context of this study, the classification of firms into high discretion and low discretion industries was based on replicating the selection procedure of companies, using Standard and Poor's Capital IQ database. This was followed by distilling the data on the constituent values for the three measurement scales and consequently calculating the median values for each of the independent variables across the longitudinal study sample period of 2011 to 2016.

Table III shows the median industry values for each of the four objective indicators of industry discretion defined in Hambrick and Abrahamson (1995). For each of the indicators, the five-year averages are calculated for each firm with the median value used as a measure of the industry characteristic. The average number of Standard and Poor's Capital IQ firms in either a high or low discretion industry was 43.

Insert Table III here

Table IV shows the overall discretion score for each industry. These scores were computed using the intercept and regression coefficients in the multivariate model on industry discretion, shown at formula (1). To differentiate between industries as either belonging to a low discretion or high discretion environment, the overall median discretion value was computed as 5.28. Accordingly, any industry with a score below the median value is categorized as a low discretion industry, while any industry with a score equal to or above the median value is categorized as a high discretion industry. For ease of reading

and interpretation, industries are listed in ascending order. As can be seen in Table IV, all industries ranging from the Blast Furnaces and Steel Mills to Certified Air Transportation are classified in the low discretion industry, while those ranging from Semiconductors to Radio and TV Communication Equipment are in the high discretion industry. In total, there are seven (7) industries belonging to the low discretion environment, while eight (8) industries are in the high discretion environment.

Insert Table IV here

In order to critically assess statistical significance for the results observed the Kruskal-Wallis non-parametric statistical test was conducted, to differentiate between the industry discretion samples. Furthermore, the Cohen's d measure of effect size was calculated to understand how the size differences can further inform and elucidate the p -values of the variables tested for both industries. The rationale for this is to understand the degree to which this study could overlay the set of data for low discretion industry with those of the high discretion industry. If the value of Cohen's d is zero (0), then there is a perfect match between the datasets of low and high discretion industries. In other words, a value of zero (0) means that the two datasets are not different at all.

As the value of Cohen's d increases, so does the indication of the difference between the datasets of the low and high discretion industries. Conventionally, a relatively well-agreed measurement scale has emerged for the interpretation of the Cohen's d (Cohen, 1988). Thus, a d -value above 0.2 is considered a small difference (about 85% overlay of data), and values between 0.5 and 0.8 are considered a moderate difference (an overlay of about 67% of the data). Any d -value above 0.8 is considered a large difference; a d -value of 1.0 has a data overlay of about 45% and a d -value of 2.0 only has data overlay of about 19% (McNamara *et al.*, 2014).

Table V shows the analysis of variance between the industry selections. It shows that for Research and Development (R&D) Intensity, there is statistically significant difference and a large size effect ($p = 0.000$, Cohen's $d = 1.89$) between the R&D Intensity of high and low discretion industries. Specifically, it shows that the value of R&D (Mean = 6.91%, SD = 5.14%) for the companies in the high discretion industry group is statistically significantly higher than for those in the low discretion industry group (Mean = 0.03%, SD = 0.08%). This is in accordance with the predicted alignment with the results in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010). Confirming that the investment in R&D by companies in the high discretion industry group is significantly higher than for those in the low discretion industry group. It also accords with the theory that the greater the ambiguity in means end relations, the more heterogenous industries become and the more managers will seek alternatives through product differentiability and varying strategic goals (Hambrick and Finkelstein, 1987). Whereas, in contrast they argue that homogeneity, prevalent in a low discretion industry will force the industry members to effectively act in concert in opposing challenges. Similarly, for Sales Growth Rate (SGR), there is statistically significant difference and large size effect ($p = 0.004$, Cohen's $d = 1.59$) between the Sales Growth Rate of high and low discretion industries. Specifically, it shows that the value of the SGR (Mean = 10.99%, SD = 7.83%) for companies in the high discretion industry group is statistically significantly higher than for those in the low discretion industry group (Mean = 1.44%, SD = 3.36%). Again, this is in agreement with the hypothesized alignment with the results in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) where both studies posited that the Sales Growth Rate of companies in the high discretion industry is significantly higher than for those in the low discretion industry. The point is also posited by Hambrick and Finkelstein (1987) that market growth is one of the key elements of enabling increased managerial discretion. Where industries with high market growth and demand instability would require managers to seek strategic opportunities increasing heterogeneity in that industry and thereby increasing discretion.

Insert Table V here

Furthermore, for Capital Intensity, there is a statistically significant difference and medium size effect ($p = 0.05$, Cohen's $d = 0.65$) between the Capital Intensity of high and low discretion industries. Specifically, it shows that the value of Capital Intensity (Mean = 24811.91, SD = 15087.80) for the companies in a high discretion industry is statistically significantly lower than for those in the low discretion industry (Mean = 370077.14, SD = 746125). Again, this is in accord with the predicted alignment with the results in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) who posit that the level of Capital Intensity in the operations of companies in the low discretion industry is significantly higher than for those in the high discretion industry. A high capital intensity restricts managerial discretion, as stakeholders will find it difficult to change strategic positions as hypothesized by DiMaggio and Powell (1983). In addition, for Advertising Intensity, there is no statistically significant difference ($p = 0.307$, $d = 0$) between the Advertising Intensity of high and low discretion industries. Specifically, it shows that the value of Advertising (Mean = 0, SD = 0) for the companies in high discretion industry is not statistically significantly higher than for those in the low discretion industry (Mean = 0, SD = 0). Although the result did not reach a level of significance, nonetheless, it is in the direction of the prediction and in line with the direction of results in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) who posit that the investment on advertising by companies in the high discretion industry is higher than for those in the low discretion industry.

Consequently, of all the four objective indicators tested, Advertising Intensity is the only variable that did not reach a level of significance despite moving in the same direction as those reported in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010). Finally, for the overall Industry Discretion measurement, there is statistically significant difference with large size effect ($p = 0.000$, Cohen's $d = 3.75$) between the Industry Discretion scores of high and low discretion industries. Specifically, it shows that the value of Industry Discretion for the companies in a high discretion industry (Mean = 5.83, SD = 0.49) is statistically significantly higher than for those in the low discretion industry (Mean = 4.43, SD =

0.19). Again, this is in line with prediction and in line with the results in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) to posit that the level of overall Industry Discretion of companies in the high discretion environment is significantly higher than for those in the low discretion industry.

Overall, the results of the study are similar to those in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010), although with varying objective indicator scores and resultant industry discretion scores. As intrinsically hypothesized, the industries in Hambrick and Abrahamson (1995) listed as belonging to the high discretion environment are confirmed in this study as belonging to the high discretion environment. Similarly, the industries listed in the prior study as belonging to the low discretion environment are similarly confirmed in this study as belonging to the low discretion industry grouping. Thus, confirming both the hypotheses H1 and H2. This shows the validity and reliability of both the managerial discretion theory and the model for predicting industry discretion in the UK context. Nevertheless, the individual discretion scores are higher for UK companies in the low discretion industry in contrast to those reported in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010). This is as a result of the differential level of Capital Intensity in the low discretion industry companies.

The result suggests that the level of Capital Intensity in the operations of companies in the low discretion industry is lower than they used to be. We posit that this could be because of technological advances, shorter product life cycles and the need for companies to move away from significant investments in property, plant, and equipment that cannot be easily adapted to meet technological- and demand- driven changes. In addition, the differential changes, in the level of discretion in industries, may be a result of the factors posited by Hambrick *et al.* (2004). In their theoretical discussion they explain why some industries in the US reflected changing levels of managerial discretion at the end of the twentieth century. They point to deregulation, increased investor activism, increasing focus on shareholder value, broadening resource dependence, an increase in business models, and managers' backgrounds diversifying. These macrosocial changes diminished the isomorphic pressures on firms, such that they became more able to differentiate themselves from others. Which may explain why managerial discretion

values are marginally different in this study but still retain the critical difference between high and low discretion industries. In sum, the results produced in this study show that firms operating in the Computer Equipment, Semiconductor, and Pharmaceutical Industries are archetypal of the high discretion environment. This is consistent with several past empirical studies (e.g., Finkelstein and Hambrick, 1990; Hambrick and Abrahamson 1995; Hambrick *et al.* 1993). On the other hand, it shows that firms operating in the Metals, Trucking, and Petroleum and Natural Gas Distribution Industries are archetypal of the low discretion environment. Again, this is consistent with several past empirical studies (e.g., Hambrick and Abrahamson 1995; McClelland *et al.* 2010).

Accordingly, the results of the study provide sufficient predictive validity of the underlying model empirically tested in Hambrick and Abrahamson (1995) and McClelland *et al.* (2010) for the purpose of establishing the discretion scores of companies operating in the UK environment. This, therefore, aids the classification of the UK companies as either belonging to the high or low discretion industry. Thereby, enabling this classification system to be utilized in research into a number of pressing research concerns. For example, an understanding of the psycholinguistic character of communications within particular industry groups.

Conclusions

This study, contributes to the comparative analysis of managerial discretion across industries beyond those known in the USA by adopting, reproducing, and validating the underlying model for measuring industry discretion. By focusing specifically on the industry-level discretion, this study shows that the coefficients of R&D Intensity and Market/Sales Growth rate are significantly higher for companies in a high discretion industry group than for those in a low discretion industry group. In addition, the results showed that the coefficient of Capital Intensity is significantly higher for companies in a low discretion industry group than for those in a high discretion industry group. The results do not reflect any significant

difference between the Advertising Intensity of companies in the two industry groups. This could be due to the selection of a representative advertising cost for an industry using the median value. As most of the companies on either side of the discretion groupings recorded little or no amount on advertising in the relevant periods considered in this study. This may also result from differential accounting reporting regulatory issues. Nonetheless in this study, at the overall measurement level of industry discretion, the coefficient of aggregate industry discretion is higher for companies in a hypothesized high discretion environment than for those in a hypothesized low discretion environment. Taken as a whole, these results clearly align with the results in the previous studies of Hambrick and Abrahamson (1995) and McClelland *et al.* (2010). In addition, the results also reflect significant size effects as measured by Cohen's *d*, which further extends and reinforces the statistical significance of the industry grouping results.

Although work remains to be done in incorporating the various sources of discretion in establishing and validating the measurement indices of industry discretion, nevertheless the results of the study provide a supportive basis for guiding scholars interested in identifying low- and high- discretion industry groups in the UK, rather than subjectively adopting a measurement construct and predictive model established in a different country operating under different principles and conditions. Therefore, based on the results of the study, interested scholars can objectively consider the pharmaceuticals, computer programming, motion picture production industries in the UK as characterized by high discretion for top executives. On the other hand, the blast furnaces and steel mills, petroleum and natural gas, book publishing, and certified air transportation industries in the UK as characterized by low discretion for top executives. In sum, researchers interested in understanding the organizational behavior of companies resident in the UK now have some objective and empirically grounded checklists for identifying companies in high and low discretion groupings. Using these classification criteria and applying the Hambrick and Abrahamson (1995) model within the UK listed market will be particularly helpful for advancing studies on fundamental organizational change issues such as the character of management ethics, styles and practices in

corporate culture, governance, social responsibility, discretionary executive compensations, discretionary accruals, differential communication patterns and earnings management.

However, as noted in previous studies, the study does not provide the absolute evidence that the level of discretion available to companies in UK industries is entirely the sole influencing factor that determines the level of discretion afforded to organizations and the managers that operate within those organizations. As noted previously, such measures of organizational and managerial sources of discretion are outside the scope of this study. However, the approach in this study could provide the basis for such measurements for the other two sources of discretion. It is noted that by beginning the analysis from the viewpoint of the broadest and most notable origins of discretion – the external environment, it provides the basis for other future research efforts that want to explore the various sources of discretion available to the top management of companies in UK industries. Although other sources may influence the amount of discretion available in an industry, further validation of the underlying model can be undertaken in future studies using sample industries in other jurisdictions in addition to the USA and the UK.

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Table I. Industries and their Discretion Scores

SIC Code	Industry Name	Discretion
		Score
1311	Crude Petroleum and Natural Gas	2.33
1040	Gold and Silver Ores	2.42
4213	Trucking Local	2.73
6331	Fire Marine and Casualty Insurance	2.92
4512	Certified Air Transportation	3.23
6211	Security Brokers and Dealers	4.27
3825	Instruments to Measure Electricity	4.33
3674	Semiconductors and Related Devices	4.62
3663	Radio and Television Communication Equipment	5.17
3841	Surgical and Medical Instruments	5.41
2834	Pharmaceutical Preparations	5.54
3570	Electronic Computing Equipment	5.77
7312	Motion Picture Production	6.08
7372	Computer Programming and Software	6.38

From "Attentional homogeneity in industries: The effect of discretion," by E. Abrahamson and D. C. Hambrick, 1997, *Journal of Organizational Behavior*, Vol. 18 S1, p. 531. CC BY-NC-ND.

Table II. Details on Standard Industrial Classification (SIC) Code per Industry.

SIC Code	Industry	Hambrick & Abrahamson (1995)	Abrahamson & Hambrick (1997)	Current Study ^a	
1040	Gold and Silver Ores	✓	✓	✓	
1311	Crude Petroleum and Natural Gas	✓	✓	✓	
2731	Book publishing	✓	✗	✓	
2834	Pharmaceutical Preparations	✓	✓	✓	2830
3312	Blast furnaces and steel mills	✓	✗	✓	
3570	Electronic Computing Equipment	✓	✓	✓	3500
3663	Radio and TV Communication Equipment	✓	✓	✓	3660
3674	Semiconductors and Related Devices	✓	✓	✓	
3825	Instruments to Measure Electricity	✓	✓	✓	3800
3826	Engineering and Scientific Instruments	✓	✗	✗	
3841	Surgical and Medical Instruments	✓	✓	✓	
3944	Games and toys	✓	✗	✗	
4213	Trucking (except local)	✓	✓	✓	
4512	Certified Air Transportation	✓	✓	✓	
6211	Security Brokers and Dealers	✓	✓	✓	
6331	Fire Marine and Casualty Insurance	✗	✓	✗	
7812	Motion Picture Production	✓	✓	✓	7800
7372	Computer Programming and Software	✓	✓	✓	7370

Total Number of Industries**17****14****15**

^a As recorded in the column on the right, six of the SIC codes used in this study vary from those used in the prior comparative studies. Given the reduced number of companies in the UK in comparison to those in the USA, it was necessary to broaden the code to the next SIC level in the fourth digit of the SIC code e.g., 2834 was broadened out to the higher-level code of 2830 (significant at the first three digits SIC) which includes other pharmaceutical manufacturing companies. This was necessary to combine the few companies (at an upper level) in the UK to match up with those in the USA.

Table III. Descriptive Statistics on the Median Discretion Scores of each Objective Indicator.

	R&D	Adv.	Capital	Market
UK Industry	Intensity	Intensity	Intensity	Growth
Blast furnace & Steel Mills	0.222	0	3838.097	-3.66%
Gold & Silver Ores	0	0	372824.569	-0.92%
Petroleum & Natural Gas	0	0	2033818.888	0.41%
Trucking (except local)	0	0	6469.930	2.16%
Book Publishing	0	0	5721.882	3.03%
Certified Air Transport	0	0	152175.811	7.06%
Security Brokers	0	0	15690.832	2.03%
Computer Equipment	3.610	0	18467.669	10.44%
Computer Programming	11.177	0	9248.792	3.72%
Engineering & Scientific Equipment	6.652	0	23082.188	6.01%
Motion Picture Production	0	0	36353.648	19.16%
Pharmaceuticals	9.094	0	48507.738	10.44%
Radio & TV	16.292	0	5808.556	3.45%
Semiconductors	3.410	0	17079.901	8.81%
Surgical	5.055	0	44227.271	25.91%

Table IV. Overall Discretion Score per Industry.

UK Industry Discretion Scores	
Industry	Discretion Score
Blast furnaces and steel mills	4.15
Gold and silver ores	4.29
Petroleum & Natural Gas	4.36
Security brokers	4.46
Trucking (except local)	4.47
Book publishing	4.52
Certified Air Transportation	4.76
Semiconductors	5.28
Computer Equipment	5.40
Motion picture production	5.49
Engineering and Scientific Equipment	5.51
Computer Programming	5.92
Pharmaceuticals	6.07
Surgical-Medical Instruments	6.50
Radio & TV communication equipment	6.52
Median Discretion Score	5.28

Table V. Analysis of Variance: Industry Selections and Objective Measures of Discretion

Measure of Discretion	Industry Discretion Groups		<i>P</i> -Value	Cohen's <i>d</i>	Kruskal-Wallis Ranking ^c
	High Discretion ^a	Low Discretion ^b			
R&D Intensity (<i>n</i> = 430) ^d	6.91%	0.03%	0.000***	1.89***	High > Low
Advertising Intensity (<i>n</i> = 430) ^e	0.00%	0.00%	0.307	0.00	High ≈ Low
Sales Growth Rate (<i>n</i> = 430)	10.99%	1.44%	0.004**	1.59***	High > Low
Capital Intensity (<i>n</i> = 430)	£24,811.91	£370,077.14	0.050*	0.65**	High < Low
Industry Discretion (<i>n</i> = 430)	5.83	4.43	0.000***	3.75***	High > Low

p*-value ≤ 0.05 *p*-value ≤ 0.01; ****p*-value ≤ 0.001

d*-value: small effect ** *d*-value: medium effect * *d*-value: large effect

a. High Discretion Industry firms are those with discretion score of **5.28 or more**.

b. Low Discretion Industry firms are those with discretion score of **4.76 or less**.

c. Group differences using Kruskal-Wallis Independent Samples test are significant at *p* ≤ .05 or less.

d. Sample sizes based on data gathered from all firm years.

e. The figures for the column on Advertising Intensity are all reported as zeros. This is due to the use of median as the selection of the industry representative. While some of the sample companies had advertising spend, they are either very minimal or with no advertising costs reported from year 2012 to year 2016.