

Understanding and Managing Firm Innovativeness in Japanese SMEs

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Abstract

This paper reports on research which sought to provide a more comprehensive understanding of the underlying components of firm innovativeness. Our theoretical and practical understanding of the complex mix of issues that influence a firm's ability to be more innovative remains fragmented at best. To develop a more thorough understanding of the phenomenon over 2000 firm owners and managers were surveyed in Japan and the results were factor analysed with twelve components emerging which associated a distinct and complex set of variables with firm innovativeness. Results indicate that it is necessary to view firm innovativeness from a multi-dimensional perspective in order to capture more thoroughly the essence of this complex and fluid phenomenon. Product, process and systems innovativeness are largely reliant upon the nature of the relationships among firm members particularly at the SME level. In recent times, firm innovativeness has held centre stage in organisational development research and given reduced cycle times, increased competition, greater consumer and market sophistication and the ever-increasing pace of change, the study of innovativeness will in all likelihood remain centre stage for some time to come.

INTRODUCTION

The calls for Japanese SMEs to become more innovative and competitive in leading the revitalisation of the Japanese economy have been vociferous, especially from policy-makers whose penchant for grandiose slogans has been largely vitiated by the lack of coherent structural reform. Firm innovativeness has increasingly become a core research focus at the individual, firm, regional, national and global levels, across a diverse group of disciplines. The prominence of researching innovativeness has increased as a function of the increasingly dynamic environments in which we live and work. Business-wise, cycle times have shortened for all value chain activities, pressuring firms to be more creative and efficient in meeting ever increasing demands. Fostering greater firm innovativeness has come to be seen by many as the most effective way for firms to compete in the markets of not only today, but those of tomorrow as well (McMurray 2003; Yamada 2003; Tegarden, Sarason & Banbury 2003). Yet, our understanding of the underlying components of firm innovativeness remains rather underdeveloped (Wang & Ahmed 2004).

Given the piecemeal nature of developed knowledge regarding firm innovativeness, the study this paper reports on, sought to broaden and deepen our knowledge of the underlying components of firm innovativeness, guided by a research design carefully crafted to enable a comprehensive and multi-dimensional understanding to be developed. Furthermore, the research was undertaken at the SME level where research regarding firm innovativeness has been scant and even more poorly developed than that concerning larger firms (Gudmundson, Tower & Hartman 2003).

‘Innovate or fall behind: the competitive imperative for virtually all businesses today is that simple’ (Leonard & Strauss 1997:111). Setting aside whether the issue is that ‘simple’, firm innovativeness has been a focus of researchers for over fifty years, yet as previously observed our understanding remains partial at best (Wolfe 1994; Leavey & Jacobsen 1999; Johannessen, Olsen & Lumpkin 2001; Gudmundson *et al* 2003). In spite of considerable cross disciplinary research efforts in fields of enquiry such as management, marketing, economics, and organisational psychology, a coalescence of opinion is far from approaching universality. Yet clearly there is consensus amongst theorists that more innovative firms perform better, as Wolfe (1994:405) notes “few issues have been characterized by as much agreement among organizational researchers as the importance of innovation to organizational competitiveness and effectiveness”. Concurring, Dosi (1988:1158) stated his belief that technological innovation and behavioural innovativeness “...underlie the competitive incentive (for the “winners”) and the competitive threat (for the “losers”) to innovate/imitate products, processes and organizational arrangements”. While more recently Hiranuma (2003:73) in the Annual White Paper on SMEs in Japan (*Chusho Kigyo Hakusho*) noted in regard to recent Japanese industrial performance, “in all size categories enterprises that are more innovative perform better”.

If the premise that more innovative firms are likely to be more effective is accepted (and it certainly appears so in the literature), then the study of firm innovativeness would seem to be of major benefit to interested scholars, managers in the field, and public policy makers alike. Tushman (1997), Kao (1997), Kanter (1997) and Chandler, Keller and Lyon (2000) amongst many other observers have all noted that an organisation’s ability to be innovative is one of, if not the most important capability an organisation must develop to be competitive in the 21st century. The business environment at the dawn of the new millennium is one of increasing volatility and

worldwide in a social sense hostility and instability appear on the rise further impacting upon business environments characterised by shorter cycle times in product/service development and delivery, rapid technological change, increasingly interrelated world markets, more knowledgeable and demanding customers and changing workplace conditions and settings. The connection between volatile and dynamic environments and the need for firms to be innovative is oft made, complimenting the link made between innovativeness and increased effectiveness and performance (Schmidt 1990). Hence “since innovativeness seems to be an important factor in today’s business environment, it is of interest to determine the organizational and environmental determinants of it” (Üzsomer, Calantone & Di Benedetto 1997:400).

Firm Innovativeness in Japanese SMEs

The observation that fostering innovativeness may just be the most critical advantage firms must develop to remain competitive is perhaps even more significant in the Japanese context. The well documented adverse effects of the ‘Lost Decade’ (see for example Hayashi & Prescott 2002; Fukao 2003) would indicate that there has been some measure of pruning of the least effective businesses from the economy over some considerable time. The lessons learnt by managers surviving and even prospering over this difficult economic period enables deep insights to be developed into firm innovativeness. Japanese management practices have long been the source of extensive research, especially given the success of Japanese firms in transforming a war-torn country into a world economic power. However, during the nineties and the early years of the 21st century Japan has appeared to be not so much that mighty world economic power, rather its economy has been beset with maladies that at times have given commentators cause for much hand wringing. As Pain (2003:2) stated “Japan has been in the doldrums for so long that most of

us have given up on spending too much time analysing it". It would appear that the halcyon era of 'Japan is No.1' as Vogel (1979) and other observers proclaimed has waned and that the shining light focused on the 'art of Japanese management practices' has dimmed somewhat. Japan has been enmeshed in a more than decade long Keynesian liquidity trap (Lincoln 2004), for even though interest rates are at historical lows the collapse in asset values and decline in prices leading to deflation, combined with expectations of more of the same has led to a significant loss of confidence on the part of individuals, households and companies. Additionally, the insolvency of the Japanese banking system resulting from massive non-performing loans and the strategic paralysis of its politicians contributes significantly to this lack of confidence.

Furthermore, researchers such as Hirakubo (2000) have estimated that for Japan to regain its competitiveness, approximately two million jobs must be cut resulting in the unemployment rate increasing from its present historical high of 5.2% to around 8%. As well, over the period 1990-2000, Japan's GDP grew a mere 1.3% compared with 3.1% in the US (Source: IMF 2003). It is little wonder that this period is referred to as the Lost Decade, yet though at a structural level Japan has been slow to turn things around (and thankfully at long last there appears positive signs in this direction), at the firm level and in particular the SME level, managers have evolved their approaches in dealing with such a hostile and changing environment, relying less on policy engendered 'miracles' and more on firm-centric changes in developing enterprises that are better able to function in such a volatile environment.

This study investigated firm innovativeness by examining how managers in Japanese firms have sought to deal with the Lost Decade. Indications are that in spite of policy indecision and plain ineptitude (Nabeshima 2004), Japan may be emerging from its economic hibernation. At the

forefront of this reawakening are Japan's SMEs; Takeo Hiranuma, the Japanese Minister of Economy, Trade and Industry (METI) in presenting his ministry's annual White Paper clearly detailed the importance of SMEs regarding Japan's economic health stating:

“Over the past 40 years, throughout various dramatic changes in the economic environment, SMEs have continued to display their unique strengths. SMEs have underpinned the development of the Japanese economy and it is SMEs that have the leading contribution to make to economic regeneration” (2003:6).

It is not just in Japan that the value of SME's contribution to economies is acknowledged, Ghobadian and Gallear (1996:85) observe that SMEs are “the life blood of modern economies”. However, much of the research into firm innovativeness up to this point has focused on the activities of large corporations (Gudmundson *et al* 2003), yet SMEs contribute more significantly to many country's economic landscape than do large companies. Statistics on business enterprise published by OECD (2004) are compelling, detailing that in Japan 99.5% of all enterprises are SMEs employing 71.8 % of all private sector employees and accounting for 51% of total exports adding annually approximately 105 trillion yen value to Japan's economic activities. While in Australia 99.5% of all firms are SMEs employing 72.3 % of all private sector employees. Rapid technological innovation and diversification in market requirements are generating significant shifts in industrial activity and dramatically transforming many economies from primary output to the manufacture of high value-added products and from the production of goods to the provision of services. As a consequence, all economies, regardless of their stage of development, need to develop and produce an increasingly diverse array of high value-added goods and services. This is an area in which the capability of SMEs to respond flexibly works to their advantage, and SMEs can be at the forefront of driving further structural sophistication and sustained economic growth.

Such industrial development must, however, be built upon the presence of SMEs with appropriate managerial and technological know-how. It will also depend upon the development of suitable supporting infrastructure for SMEs. Supporting industries constitute an essential part of the industrial infrastructure needed for expanding foreign direct investment, stimulating the formation of regional production networks, and contributing to domestic and regional economic growth.

Building on the observation that innovative firms generally perform better and that SMEs are the backbone of a nation's economic prosperity it would appear critical that we understand more comprehensively what underlies firm innovativeness. Combine this with Japan's lacklustre performance in terms of growth and competitiveness over the past decade and more and it would appear that management theorists, practitioners and policy-makers alike could learn much from concerted investigation into the underlying components of firm innovativeness in Japanese SMEs. This paper reports on such a concerted endeavour and the following section presents the methodology used to examine firm innovativeness in Japanese SMEs.

METHOD

To advance the understanding and definition of the complex issue of firm innovativeness a multi-method research approach was taken. Firstly, from the literature it was observed that factors researchers have accepted as useful in examining innovativeness fall into three broad areas – environmental factors, firm conduct factors and outcome factors. Measurement items were selected from these three perspectives based on their pedigree in the literature and appropriateness for the study. Strong patterns emerge in the literature regarding the reliability and usefulness of the items and it is possible in many cases to trace their historical development. However, the

scope and diversity of factors and the variables used to measure those factors remains very broad. Hence, in order to condense and create some sense of order amongst so many variables Principle Components Analysis (PCA) was considered the most appropriate approach given the exploratory nature of the research. As Tabachnick and Fidell (2001:612) detail “PCA is the solution of choice for the researcher who is primarily interested in reducing a large number of variables down to a smaller number of components”. Following the PCA, a phenomenological design using case study methodology was used to investigate further the nature of the components.

This process enables the researcher to ‘tease out the core characteristics’ (Renstch 1990) of the issues under investigation. The use of both positivist and phenomenological approaches provides both the skeleton and the flesh to the phenomenon being researched thereby benefiting from the positive attributes of both quantitative and qualitative methodologies, whilst to some degree overcoming the limitations inherent in both methodologies when applied singularly. A pilot study was conducted which examined the large number of variables (well over 100) proposed by theorists as being significant in regard to firm innovativeness. The pilot study also tested the survey instrument in terms of content, language and presentation. This was followed by the first round of fieldwork in Japan, which involved collection of data generated by the quantitative survey. Exploratory factor analysis was then conducted using PCA in reducing a large number of variables (115 in all) to a smaller number of components significant in influencing firm innovativeness. At this stage the number of variables had been reduced to 54 resulting in 12 components being extracted via PCA. The extracted components which were stable over the complete range of extraction and rotation methods provided by SPSS 12.0 (i.e. 35 iterations in all) provided the basis for the second formal pilot study which tested the content, language and presentation of the case study questions. The second round of fieldwork was then conducted in

Japan with 10 case studies being developed¹. Final data analysis was conducted using results from both the quantitative survey and the qualitative case studies. This multi-method approach enabled the research “to combine empirical precision with descriptive precision” (Onweugbuzie & Leech 2004:771) and provided a more comprehensive understanding of the underlying components of firm innovativeness to be developed.

Sample

The sample for the study was taken from a peak association based in Tokyo representing SMEs whose members are located in the Kanto area of Japan. The association has 2,235 members representative of a wide range of firm sizes and industries. The sample is consistent with sampling frame characteristics as detailed in the Japanese Government’s Small and Medium Enterprise Agency’s 2003 *Chuso Kigyo Hakusho*. Of the 2,235 questionnaires sent to firms 1,868 were returned at a response rate of 83.6%. Of the 1,868 responses 16 responses were not considered useable, meaning the number of useable responses was 1,852 resulting in an effective response rate of 82.9%.

RESULTS

Rummel (1970) and Gorsuch (1983) advise that at the 0.05 significance level if the loading matrix has been orthogonally rotated, values of correlations between variables and components of 0.32 and higher are meaningful and that researchers should endeavour to develop a concept that unifies the group of variables. The data set comprising 1,852 cases across 54 variables was analysed using PCA with varimax rotation. This accounted for 78.4% of the variance explained with 12

¹ Note: due to word limitation and the sheer size of this study the case study results are not presented in detail here. The case study results reaffirmed results presented in this paper and observations presented in the Discussion section are a reflection of both the quantitative and qualitative studies.

components extracted having eigenvalues greater than 1. Nunnally and Berstein (1994) detail that most solutions contain a few major components that account for a significant amount of the variance and this was found to be the case in this analysis. The first two components accounted for 45.7% of the variance un-rotated and 40.8% rotated. The remaining 10 components accounted for 37.6% of the variance explained when rotated. The ratio of components extracted to variables measured was 4.5, falling within the 3-5 range advocated by Tabachnick and Fidell (2001) indicating that neither under nor over-specification has occurred. Given that the data is cross-sectional and self-reported, added attention was also directed towards the issue of common method variance. Podsakoff and Organ (1986) detail that if common method variance is present in a factor analysis one single factor or one general factor will emerge and account for the majority of the covariance. The un-rotated PCA showed that the first component accounted for 33.6% of the total variance explained. This represents well less than half of the variance explained by the PCA, indicating that common method variance was not an issue (Podsakoff & Organ 1986).

The varimax rotation yielded a range of loadings from 0.414 to 0.835 with all variables identifying strongly with at least one component. Twenty four of the total fifty-four loadings (44.4%) were above the 0.71 level considered 'excellent' by Comrey and Lee (1992); 16 or 29.6% were above 0.63 but less than 0.71 and thus considered 'very good'; 8 loadings (14.8%) were in the 'good' range between 0.55 and 0.63; 6 loadings (11.1%) were in the 'fair' range between 0.45 and 0.55 while the remaining 2 loadings (3.7%) were between 0.32 and 0.45 and hence considered 'poor' measures, however, they were retained as they are meaningful to the interpretation of the components and at 0.426 and 0.414 respectively are well above the 0.32

significant level advocated by Tabachnick and Fidell (2001) and above the 0.30 level proposed by Hair *et al* (1998).

To further examine and test the reliability of the items and the components, Cronbach's coefficient alpha which reflects both the number of items and their average correlation was conducted using Reliability Analysis (RA) in SPSS 12.0. A low coefficient alpha indicates that the measure has too few items or items with very little in common, while an acceptable coefficient alpha provides a good estimate of reliability (Chin 1998). The analysis was undertaken on two levels; firstly, to measure internal consistency of the measures and secondly, to measure the reliability of the extracted component structure.

Total scale reliability as measured by Cronbach's coefficient alpha was computed for the 54 items. The item to total scale alpha was 0.858. Hair *et al* (1998:118) detail that "the generally agreed upon lower limit for Cronbach's alpha is .70, although it may decrease to .60 in exploratory research". As this research is exploratory in nature it meets the 0.60 and 0.70 criteria satisfactorily. Bryman and Carter (2001) suggest a more rigorous level of .80 be adopted and that researchers calculate reliability estimates for the individual underlying dimensions extracted. The overall scale result of 0.858 meets and exceeds the more stringent level advocated. The individual reliabilities for the twelve components were also computed and are presented in Table 1.

TABLE 1 Component Alpha Coefficients

Insert Table 1 about here

As detailed the number of variables used to examine the underlying components of firm innovativeness is extensive and Table 2 presents the extracted component matrix. As well, attached in the Appendix is the complete list of variable designations.

TABLE 2 Extracted Component Matrix

Insert Table 2 about here

DISCUSSION

The study of firm innovativeness has in a general sense been somewhat disjointed, with activities such as new product development or new technology adoption isolated via a priori assumptions to gauge impacts on firm outcomes. This propensity to isolate a particular factor and examine its impact on firm innovativeness has in recent times been challenged by authors such as Henderson and Mitchell (1997), Wallace *et al* (1999) and Wang and Ahmed (2004). Criticism has been levelled at this approach as the results tend to be skewed in favour of the uni-dimensional selection of variables, depriving the findings of any real meaning. The multi-dimensional components presented in Table 2 express extensive associations between individual firm members, groups and work teams, leaders and mentors, the firm as a whole along with environmental issues including regional systems of firm agglomeration as well as consumer and market uncertainty. This goes beyond present developments in theory providing a more comprehensive, current and deeper understanding of the underlying components of firm

innovativeness. Given the extensive nature of the results of the PCA, Table 3 provides a summary or interpretation of the nature of the 12 components.

TABLE 3 Interpretation of Component Matrix

Insert Table 3 about here

Perhaps the most puissant result is the emergence of the two alpha components which have been labelled *Supporting and Trusting Firm Environment* (Component 1) and *Innovate* (Component 2). The nature of these two components integrates firm issues that transcend the culture, climate, structure divide. Most critically, the level of support that management provides firm members is associated with the level of trust between managers and firm members and amongst workmates themselves. Trust and support have been found to be at the very core of innovativeness and if the twelve components are analysed in detail it is evident that aside from the *Environmental Uncertainty* component (Component 6), trust and support can be placed at the heart of the associations each component represents. The *Supporting and Trusting Firm Environment* and *Innovate* components and the issues they reflect lie at the very core of firm innovativeness and like fuel cells provide the energy and power for firms to be more innovative. This is profound for instead of focusing on a particular innovative activity, such as new product development or rates of adoption of new technology, managers would be better rewarded by firstly concentrating on the underlying support mechanisms and interpersonal links that form the basis of any human interaction involved in these and other organisational activities. Trust and support among firm members incubates the freedom and creativity so necessary in achieving greater innovativeness. Trust and support also enables learning which not only increases the knowledge and competence

of individual firm members, it adds to the aggregate competence and knowledge of the firm. The quality of the interrelationships between management and firm members and amongst firm members themselves is the fabric which binds the character of the organisation. A sense of dynamism in the workplace is critical in promoting firm innovativeness yet it is crucial to understand that the dynamic is supported by the sturdy shoulders of interpersonal trust and support. The raw ingredients for greater innovativeness largely reside within the firm, yet often lie wastefully dormant.

Aside from providing a more comprehensive and deeper understanding of the underlying components associated with firm innovativeness, the results provide several other key developments, which are theoretically and practically significant. Regional systems of innovativeness (Components 3, 9 & 12) have been found to be influential upon a firm's ability to be more innovative. In times past, the effects of spatial systems have been studied by economists concerned with the interaction between geographic proximity and the effect this has on a firm's profitability, in terms of cost reductions and access to resources and markets. This study too, examined these issues however broadened the focus of attention to include examination of the associations between regional systems and firm behaviour in terms of networking and heterogenous knowledge development as well as operational and market efficiency. The strong associations found between regional systems and firm innovativeness included input/output cost reduction issues as well as resource access issues. Furthermore, it was found that firm networking activities were enabled by a diverse mix of businesses in milieu which impacts positively on information gathering activities and knowledge development on individual, group and firm levels. This facilitates the generation of ideas, creativity and innovativeness in respect to operations, customers, market maintenance and development and perhaps most critically feeds back into the

firm's psyche, promoting learning, competence, enthusiasm and satisfaction. Perhaps in our rush to become more global in nature we have overlooked the value of regional systems and the significant impact they have on firm innovativeness.

Sustained innovativeness will be enabled by the exchange of knowledge and information among a diverse range of firms in a regional system and policy-makers have a central role to play in building and maintaining the channels that facilitate the exchange. Structural and policy impediments must be streamlined or removed altogether for government officials cannot expect firms to be more flexible, innovative and competitive, if government is seen to be setting a policy agenda that acknowledges the need for change, but due to the clamour of various vested interests, achieves in reality mere stasis.

Such a broad perspective enriches the examination of environmental influences on firm innovativeness as theorists since the time of Schumpeter (1934) and beyond have measured environmental forces in terms of uncertainty in regard to customers, markets and technology. Significantly, this observation is intertwined with the notion that management theorists need to be aware of other complex issues that may have become more ascendant in regard to environmental impacts on firm innovativeness, issues such as regional systems of innovativeness. As such, the conceptualisation of environmental uncertainty in terms of customers, markets and technology may have been outpaced by developments in how firms view their environments. This is particularly poignant in the Japanese environment where over the Lost Decade uncertainty described in these terms has become a ubiquitous part of the economic landscape. Uncertainty regarding customers, markets and technology continues to influence firm innovativeness (as shown by Components 4,6,7,8 & 10) however to remain relevant theory must move in time with

practice and results indicate that it would be more effective for firms to leverage resources and capabilities towards developing channels between the firm and its customers that result in not only an increase in individual and aggregate firm knowledge but also a strengthening of the bond between the firm and its customers. Hence, the firm attempts to internalise its customers, as opposed to from arm's length endeavouring to second guess the nature of demands and preferences.

There is one thing managers should be very clear about – they are the primary influence in regard to facilitating firm innovativeness. A piece of new technology will not instantly transform a firm into an innovative entity for the roots of innovativeness are not so shallow. Rather, managers must actively work towards developing and nurturing the grounds for innovative activity to occur. Malecki (1995) amongst others has noted that SMEs are disadvantaged in terms of resource munificence compared with larger companies, however, one plane that SMEs can effectively compete with larger companies on, is firm member capability. In this regard owners and managers would do well to cast a wide net in building-up the capabilities of firm members through training and development programmes, through supporting employees in their endeavours, through rewarding firm members in an appropriate fashion (irrespective of age or gender) particularly given the significant changes to labour force demographics occurring worldwide.

It is poignant that in order to enable the new and creative, we must nourish the age old values of support, trust and respect, values that many fear are being eroded worldwide. Stronger interpersonal relationships among firm members are critical in facilitating greater creativity and learning. Furthermore, the ability of management to provide support to employees via open

communication channels on both formal and informal levels, training and education programmes to enable personal development and what may be referred to as systemised freedom and creativity, are also vital. Systemised freedom and creativity may appear to be somewhat of an oxymoron however, Japanese philosophy is at times shaped by a paradoxical undercurrent representing the mutuality between underlying structure and beauty and elegance. To enable freedom and creativity, employees and management must be confident in the support of organisational systems that deal with the tangible so that the intangible may be fostered. So too, they must be confident in each other's competency which is a function of the skills and capabilities developed through experience, training and education. To conceptualise and develop novel ways of doing things, firm members must feel the security of support and trust from management which will empower them to participate and contribute at a level far in excess, than if support and trust was lacking.

Creativity and learning will not magically occur without a supportive framework, yet how do managers build this base? Theory provides the power of knowledge for managers yet often there is a breakdown between understanding the worth of the knowledge and putting it to good use in an organisational setting. For example, it has just been asserted that creativity and learning are vital in facilitating firm innovativeness - the challenge thus is operationalising this observation as firms go about their activities. Managers must research and develop effective ways of transferring theoretical knowledge to the organisational domain. If this can be achieved in conjunction with strengthening the social bonds within the firm then an even greater effect may be achieved. It is vitally important that firm owners/management build emotional equity in the firm, bestowing great value on firm members but netting collectively for the firm even greater value in terms of knowledge, skills, competencies, creativity and commitment. Firm innovativeness has become an

issue of major importance in the quest to develop companies that are more creative, efficient, competitive and most importantly healthy in the long-term. Innovativeness can not be prescribed as it assumes many guises and permutations however at the heart of innovativeness is human activity and interactions. It is evident then that we need to nourish the roots of firm innovativeness and not just the leaves.

Appendix: Explanation of Variable Labels

Variable Abbreviation	Explanation
MgtSupport	Management Support for employees in regard to personal/professional development
MgtTrust	Firm employees level of Trust in Management
DMStyleStrat	Speed and scope of senior management's strategic Decision-Making Style
OrgPride	Level of Organisational Pride
StaffDevelopment	Level of emphasis placed on Staff Development
WorkerRships	Nature of Relationships amongst firm Workers
TeamBuilding	Level of emphasis on Team Building
PerformRewards	Whether rewards are based on performance or seniority
EmpCompetency	Level of Employee Competency
DMparticipate	Level to which firm members Participate in Decision-Making activities
MgtEmpRships	Nature of Management/Employee relationships
NewTechnology	Emphasis placed on development and use of New Technology
NovelSolutions	The degree to which Novel Solutions to problems are sought
WplaceAtmosphere	Whether Workplace Atmosphere is dynamic or staid and unchanging
EmpProposals	Degree to which Employee Proposals are sought and implemented
WorkNature	Degree to which Nature of daily Work is challenging and exciting or mundane and routine
ContImprove	Degree to which firm seeks to Continually Improve
CustService	Level of focus on Customer Service
NewProducts	Rate of New Product development
PerformReg	Degree to which Regional networks impact on firm Performance
NetworkFormal	Level of Formal Networking in region
NetworkInformal	Level of Informal Networking in region
NetEffectiveness	Effectiveness of overall firm Networking in region
GovtInfluence	Degree to which Government policies Influence firm's ability to be more innovative
FirmPerformance	Rate of Firm Performance
NewMarkets	Level of New Market development
RofCoperations	Rate of Change in firm's operations
QualityControl	Level of focus on Quality Control
Ecommerce	Level of E-Commerce activities
Resources	Degree of Resource munificence
SystemsControl	Degree to which operations are tightly or loosely controlled
MgtRiskPropensity	Management's Propensity for Risk
RofCenvironment	Rate of Change in a firm's environment
PredictConsDemand	Whether Consumer Demand is Predictable
PredictCustPreference	Whether Customer Preferences are Predictable
RofOProducts	Rate of Obsolescence of a firm's Products
RofCopsmethods	Rate of Change in Operational Methods
D-MStyleOps	Approach to Operational Decision-Making
Adaptation	Degree of Adaptation to changes in firm's environment
D-MStrategy	Level of consensus and consultation in Strategic Decision-Making
MgtStyle	Level of formality and consistency in Management Style no matter the situation
CommChannels	Level of formality/informality in communication channels
Compet Posture	Degree to which Competitive Posture is proactive or reactive
EnviroOpportunities	Level of Environmental Opportunities available to firm
RegionalMix	Degree of diversity of firms in region
KnowledgeDiffusion	Degree to which knowledge diffusion amongst firms in a region enables learning
OppAction	Degree to which a firm Acts on Opportunities
MarkStrat	Level of global orientation in firm's Marketing Strategy
CostControl	Level of focus on Cost Control
D-Moperations	Work unit involvement in daily Decision-Making
MgtbyException	Degree to which Management focuses on mistakes and irregularities
JobRules	Degree to which operations are governed by Job Rules
CostReduction	Degree to which Cost Reductions are realised by firms in milieu
RegResources	Degree to which level of Regional Resources impacts on firm's ability to be innovative

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Table 1

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Cronbach's Alpha	0.898	0.873	0.856	0.855	0.851	0.860	0.811	0.781	0.802	0.815	0.775	0.632

Table 2

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
MgtSupport	.790	.130	.124	-.021	-.028	-.027	-.134	-.069	.064	-.013	.036	.054
MgtTrust	.752	.222	.078	-.090	.102	.142	-.119	-.057	-.029	.083	.115	-.074
DMStyleStrat	.695	.117	-.101	.125	.038	.115	-.009	.006	.097	.144	.062	-.003
OrgPride	.667	.106	-.035	-.045	.012	.184	.090	.036	.017	.051	.044	-.131
StaffDevelopment	.663	.135	-.149	.205	.165	.087	.103	-.051	.048	-.096	.012	.179
WorkerRships	.662	.104	.018	.058	.023	-.160	-.007	-.007	.126	.015	-.137	-.064
TeamBuilding	.618	.153	.067	.120	.127	-.062	-.010	-.058	.026	.188	-.057	-.275
PerformRewards	.563	.194	-.047	-.024	.135	-.038	-.020	-.047	-.091	.102	.125	-.012
EmpCompetency	.530	.107	.105	.078	-.099	.059	.019	.164	.150	-.108	-.283	.162
DMparticipate	.426	.184	.132	.128	.153	.018	.081	.146	-.192	-.125	-.004	-.190
MgtEmpRships	.414	.163	.197	-.103	.006	.087	-.080	-.143	-.152	.160	.140	.056
NewTechnology	.208	.749	-.089	.145	.144	.109	.046	.039	-.023	.071	-.005	.053
NovelSolutions	.199	.747	-.003	.154	-.036	.103	.145	-.058	-.003	.138	.075	.085
WplaceAtmosphere	.248	.716	.021	.106	.172	.004	.035	.001	.093	.193	-.106	-.034
EmpProposals	.231	.716	-.002	.124	.147	.020	-.106	-.041	.143	.108	.028	-.185
WorkNature	.150	.698	.198	-.056	-.017	-.007	.225	.151	-.093	-.086	.169	-.066
ContImprove	.142	.635	.080	.013	.059	.119	.070	-.108	.160	.187	.032	-.013
CustService	.100	.532	-.002	.174	.091	.001	-.062	-.083	.178	.028	-.028	.189
NewProducts	.081	.531	-.028	.131	.124	.122	-.163	.094	.045	-.089	.113	.017
PerformReg	.019	.082	.813	.201	.083	.060	.197	.243	.082	-.057	-.055	-.100
NetworkFormal	.001	.159	.745	.007	.108	.084	-.170	-.418	-.089	-.010	.153	-.056
NetworkInformal	.186	.201	.718	.256	.103	.147	-.084	.094	-.122	.125	.116	.183
NetEffectiveness	.128	.144	.686	.210	-.002	-.041	.065	.125	.139	.162	-.149	-.242
GovtInfluence	.107	.180	.657	.143	.144	-.147	.187	.170	-.081	-.029	.060	.027
FirmPerformance	.058	-.190	.301	.718	.096	.046	.175	-.010	.065	.110	.084	.058
NewMarkets	.132	.197	.015	.656	.102	.164	-.180	-.092	.101	.017	-.032	.018
RofCoperations	.164	.188	.011	.655	-.087	.189	-.107	-.139	.173	.085	-.039	-.033
QualityControl	.012	.289	.145	.631	.034	.023	.137	.045	.112	-.094	.146	.029
Ecommerce	-.163	-.085	.166	-.107	.761	.186	-.034	-.133	-.056	-.121	.028	-.267
Resources	-.185	.029	.185	-.180	.668	.107	.167	.116	.035	-.077	.104	-.210
SystemsControl	.051	.164	-.157	.114	.639	.144	-.061	.149	-.074	.127	.066	.059
MgtRiskPropensity	.136	.195	-.105	.155	.556	.065	.195	-.006	-.010	.096	.103	-.059
RofCenvironment	-.053	.014	.080	.022	.035	.822	.199	-.032	.086	-.052	.017	.090
PredictConsDemand	-.010	.126	.026	.038	-.008	.754	.028	-.005	-.026	.035	.091	.088
PredictCustPreference	.035	-.057	.175	.062	.024	.731	-.021	-.163	.009	.142	.140	.108
RofOProducts	.034	-.061	-.107	.207	.103	.690	.145	-.015	.054	.216	.104	.006
RofCopsmethods	-.044	.085	.011	.157	.035	.242	.835	.113	-.051	-.170	.174	.035
D-MStyle	.204	-.098	-.021	-.048	-.053	-.065	.788	.201	-.028	-.292	.084	.058
Adaptation	.177	.054	.254	.056	.037	.090	.708	-.132	.142	.091	.119	.160
D-MStrategy	.155	.042	-.155	.085	.165	.199	.618	.076	.038	.021	-.038	-.030
MgtStyle	-.042	.156	.223	.017	-.133	.102	.016	.773	.035	.021	-.009	.088
CommChannels	.184	-.038	.094	.102	.095	-.144	-.073	.754	-.021	.070	.000	-.079
Compet Posture	.140	.048	.002	-.105	.253	.120	.024	.587	.048	.067	.017	.113
EnviroOpportunities	.059	.022	.021	-.044	-.007	-.069	.052	.007	.805	-.084	.115	.090
RegionalMix	.176	.095	.061	.135	.038	.328	-.070	-.043	.726	.086	.144	.075
KnowledgeDiffusion	.033	.017	.289	.152	-.137	-.271	.179	.057	.698	.142	.005	.119
OppAction	.116	.153	.095	.069	.057	.102	-.029	.166	-.037	.789	.018	.040
MarkStrat	.197	.107	.290	.205	.053	.153	-.018	-.095	-.045	.713	.194	.221
CostControl	.062	.126	.020	.171	.108	-.066	-.043	.083	.061	.525	.006	.157
D-Moperations	.131	.036	.081	.158	.005	-.013	-.174	-.225	-.027	-.139	.668	.024
MgtbyException	.013	-.080	.099	-.034	.085	.111	.140	-.184	.191	-.091	.645	-.018
JobRules	-.067	-.001	-.221	-.032	.150	-.111	.162	.184	-.030	-.011	.507	.021
CostReduction	.075	-.005	-.059	-.013	.086	-.053	.053	.153	.164	.231	.067	.756
RegResources	.001	.182	.153	.188	-.011	.184	.164	.115	.050	-.250	-.079	.730

Table 3

Component Number	Component Label	Component Interpretation
1	<i>Supportive and Trusting Firm Environment</i>	Relates that human actions are centre stage in the innovativeness debate and that the core component facilitating firm innovativeness is the quality and depth of relationships and personal development in terms of trust, support and participation. This supports key issues such as organisational pride, employee competence and reward systems
2	<i>Innovate</i>	Relates that firms must strive to develop an atmosphere of dynamism in the workplace that stimulates firm members, building on personal development, training, employee competency and satisfaction through embracing new technologies, products, processes and solutions
3	<i>Regional Networks</i>	Relates that formal and informal networking activities with both business and government agents are critical in increasing firm knowledge
4	<i>Institutionalised Performance</i>	Relates that new market development supported by key institutional capabilities of being able to change operational processes while maintaining focus on quality control are associated with overall performance
5	<i>Ecommerce</i>	Relates that a firm's propensity or inclination to undertake business activities using the internet is dependent upon the level of IT infrastructure in the firm (i.e. quality of system's hardware), sophistication of software to drive the hardware and the level of expertise on the part of employees in using the system. Underlying this is senior management's inclination to take risks in undertaking such activities and investing in such systems
6	<i>Environmental Uncertainty</i>	Relates that uncertainty is associated with customer preference and demands for a firm's products and services
7	<i>Firm Flexibility</i>	Relates that firms must be operationally flexible in adapting to changing business conditions and that underlying this is management's approach to decision-making
8	<i>Proactiveness</i>	Relates that there is an association between flexibility in management approaches, the development of open, informal communication channels and the firm's ability to initiate action in market environments
9	<i>Regional Mix</i>	Relates that there is an association between external opportunity, the degree of diversity amongst firms in milieu and the rate of firm learning as a result of knowledge diffusion
10	<i>Action Orientated</i>	Relates that firms that place strong emphasis on continually seeking to develop new products and services will also be better positioned to take advantage of opportunities and that supporting this there should be a strong focus on cost control
11	<i>Empowerment</i>	Relates that there is an inverse relationship between operational decision-making, empowerment and management approaches based on highlighting mistakes and irregularities and adherence to formal job rules
12	<i>Regional Agglomeration</i>	Relates that input/output cost reductions a firm may be able to achieve, are associated with access to specialised resources concentrated in a firm's particular local region