Modelling Appropriateness of Balanced Scorecard Utilisation in the Context of Chinese Manufacturing Industry

Abstract

This paper aims to examine appropriateness of Balanced Scorecard (BSC) utilisation in the Chinese organisational context affecting performance. Rooted in contingency theory, BSC utilisation, through being an interactive system as a whole and a diagnostic use of measurements for performance management (financial, non-financial, and communication) it is conceptualised that they act as mediators affecting five contextual variables on performance. These expectations were examined using a survey sample generated from responses by Chinese Senior Managers to a questionnaire (n = 247). The empirical results show that state intervention as a contingency variable has a positive and significant impact on the effect of using financial measurements and the communication of BSC on performance for these Chinese manufacturing industrialists. Financial performance measurements and communication of BSC, play mediating affects on the relationships between customer satisfaction driven strategy, decentralisation and size on performance, no significant impact generated by BSC utilisation, as a whole, although.

Keywords: contingency theory, interactive and diagnostic BSC utilisation, organisational context, performance

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I. Introduction

Effective design and implementation of management accounting techniques and systems has been leading the evolution of management accounting. To be appropriate with changing social, economical, and organisational environment, management accounting, to date, has been a greater level of sophistication in the form of management control systems (MCS). For instance, strategy performance management systems (SPMS), have been designed and implemented to control strategy in order to achieve organisational goals (C.S. Chapman, 2005). One form of MCS, BSC, its development and adoption has been seen as a milestone in management accounting (Atkinson, Balakrishnan, Booth, & Jane M Cote, 1997).

The last two decades have witnessed an astonishing development in the design and implementation of BSC in response to varying pragmatic demands combined with academic research. Started to be documented as a generic performance measurement system, till BSC has been seen a diagnosis performance management system and an interactive strategy management system (R. Kaplan, 2009). BSC has attracted a range of studies, which have examined its concept to investigated its implementation (e.g. Wong-On-Wing, Guo, Li, & Yang, 2006) since its appearance. Yet, a less attention has been paid to reveal the outcome of BSC utilisation.

A limited number of studies provide mixed results on the consequence of BSC implementation. On the one hand, the study of Hoque and James (2000) indicated that: firms using BSC, and therefore involving non-financial performance measures, self-reported a better performance compared with peers within the same industry. Malina and Selto (2001) found evidence of an indirect relationship between BSC's management control function and improved performance through the measures used in BSC communicating strategic objectives and serving as a management control devices. The investigation of Malina and Selto (2001) was conducted in a large manufacturing organisation with an extensive field study. Ittner et al. (2003) provided contradictory evidence to the above two studies, through research on the financial services industry. Thereby, a negative association between BSC usage and financial performance (e.g. return of asset) was demonstrated, on the other hand.

Given the literature on the relationships between the use of performance management system, such as BSC, and an organisation's performance and the mixed results reported in the literature on BSC implementation, further investigation into the utilisation of BSC are needed, perhaps, to explore the linkage between using BSC and organisation's performance. The inconsistent results reveal that BSC utilisation cannot simply be assumed to have a positive or negative consequence. The outcome of BSC utilisation might, under certain circumstance to be related to its context, where it is implemented. For instance, the appropriateness of BSC usage and organisational context, regarding such factors as: strategy type and organisation size may influence the outcome of its use. One possibility to approach this phenomenon is to combine investigations of BSC implementation with research on organisational context, in which, it is utilised.

The possibility of BSC in connection with organisational context reflects the notion of contingency studies. Contingency studies suggest that as effective MCS implementation is contingent upon the degree of the fit between MCS and organisational context (Hartmmann and Mores1999). It has the potential that the effectiveness of BSC utilisation is contingent upon the extent of fit between BSC utilisation and contingency variables. In other words, how much BSC utilisation contributes to organisational goals or performance, relies on the

extent of how BSC utilisation fits into the organisational context. Studies of BSC in the literature have also been criticised on the basis that they ignored contingent factors (Chenhall 2003). It is likely that these factors, such as: strategy, competitive environment, and customer requirements; may influence BSC utilisation as a PMS.

This possibility is strengthened by the argument that given the large body of evidence in the literature that management accounting can only be properly understood when they are rooted into organisations and societies (Chapman, Cooper, & Miller, 2009; Anthony G. Hopwood, 1978 for reviews), it may be the case therefore that potential exists to develop our understanding of management accounting practices through examining how effective BSC utilisation in improving an organisation's performance is by its match with organisational context; and how BSC utilisation is influenced by the social and economic environment it is used in. It has been suggested by Hopwood (1997) that:

> *"While accounting in action is now embedded in multi-national enterprises…accounting research still tends to focus on national contexts and thereby remains largely influenced by national traditions and national schools of thought."*

Indeed, given the mixed effects found on BSC utilisation in the western environment, it is less than certain that the appropriateness of the Asian context for BSC usage determined. China as the largest Asian country provides a useful content to explore management accounting practices. Under the policy of economic reform, the Chinese economy is facing significant changes that are transformations from a central planning one to one involving market orientation, from a single from of state-owned enterprises to a diversity of forms. The current Chinese economy under transition performs provides the following two features. Firstly, during the process of reform of SOE, the Chinese authorities are gradually reducing their direct intervention in companies' operation and management through instead using laws, policies, and regulations to monitor the return of state-owned assets. Secondly, they are formalising encouragement of a market orientation to the Chinese economy by choosing modern enterprises systems used to operate and manage business for profit maximisation.

These two mixed natures make accounting systems used by Chinese organisations complex and varied. Accounting practice is not only influenced by organisational factors, including such contingency variables as competitive environment but also the role the changing social and economic environment can have (e.g. O'Connor 2006). The study of management accounting practice in China opens up the possibility to contribute to knowledge in understanding the Chinese transitional situation regarding to how the social and economic environment influences the design and implementation of particular accounting techniques and management control systems. To gain the knowledge of how Chinese society shapes accounting systems, this investigation of this study details was carried out in China where organisations operate, where accounting systems are utilised.

Research on PMS including BSC has mainly concentrated on organisations operating in western countries with a small number of exceptions (e.g. O'Connor, Deng, & Luo, 2006). One of the tendencies of globalisation is that a platform is provided to rapidly share information, knowledge, techniques, and technological innovations worldwide. There is, therefore, a growing demand for examples in Asia where manufacturing industry growth has been concentrated in recent years. Adoption of BSC is increasing in Asia but little evidence has been provided to support how it affects the companies using it in national

context. To gain the knowledge of how Chinese society shapes accounting systems, including BSC, this study aims to examine whether effect that the extent of BSC utilisation has on firms' performance is contingent upon organisational contextual variables.

The following content of this paper is to report the findings of a study that was nomothetically approached using the method of a questionnaire survey. A survey sample was gathered from 247 senior managers in Chinese manufacturing industry at organisational level that sought to test those possibilities above. The empirical results were gained through an analysis of the survey sample using a structure equation model. This paper makes a significant contribution to the literature with the finding of emphasising the role of state positively enhancing performance for those organisations adopting BSC, through the issued regulations and the appointment of boards' members. Consistent with the literature, this paper suggests that the more reliance on the utilisation of BSC elements e.g. communication for managing strategy in decentralised and large organisations would make a greater contribution to organisational performance as compared to less BSC adopted for strategy performance management system. This paper distinctively examines the interaction impact of BSC utilisation and organisational context on organisational performance in a Chinese context that is vastly different from the Anglo-American focus of much of previous literature.

II. BSC conceptualisation and the studies on its effectiveness

The conceptualisation of BSC has passed through three distinctive stages functioning BSC as a performance measurement system, a diagnosis performance management system, and an interactive strategy management system (R. Kaplan, 2009 for a review). The benefits provided by BSC throughout the three developmental stages have lead to distinguishing criteria which differentiate BSC from other PMS approaches e.g. key performance indictors (KPI). Distinguished from other PMS, a corporate scorecard, at the first stage, was used by senior executives to evaluate companies' overall performance using performance measures well-organised by BSC around four perspectives — financial, customer, internal process, and innovation & learning (R. S. Kaplan & Norton, 1996a).

At the second stage, BSC was labelled as a diagnosis performance management system, which provides a systematic way of analysing critical performance variables and measures associated with intended strategies or goals. At the third stage, BSC is further evolved into an interactive strategy management system, which is a catalyst for innovation and adapting to competitive environments. The updated conceptualisation of BSC has been considered as an interactive strategy management system, that provides a live system, whereby, the external environment information gathered by BSC is combined with the information on internal operation, in mapping an integrated picture, for formulating and implementing organisational strategy (R. Kaplan, 2009).

While, diagnosis BSC focuses on the predicable goal achievement needed for intended strategies and less on innovation and opportunity-seeking, the following two aspects distinguish an interactive strategy management system from diagnosis through the way, in which, the information flows in a crafted system. Firstly, the information on organisational strategy is formalised within this system whereby organisational environment such as market demand is interactive with strategic planning decided by senior managers. Kaplan (2009) states that 'managers use internal operational data and new external environmental and competitive data to test and update the strategy, which launches a loop around the

integrated strategy and operational management system'. This system is designed to trigger the adjustment the targets embedded in the plans and programs required for the implementation of intended strategies.

Secondly, the changes of organisational strategy can be sufficiently communicated throughout organisation with the interactive BSC. The changed organisational strategy is decomposed into: divisional, group, and individual objectives; communicated through this system. Data produced from this system are interpreted and discussed through meetings where: superiors, subordinates, and peers interact with each other. The system is a catalyst to interaction with continual challenge and debate regarding underlying data, assumptions and action plans. Kaplan and Norton (1996) state that: 'by articulating the outcomes, the organisation desires as well as the drivers of those outcomes [by using the BSC], senior executives can channel the energies, the abilities, and the specific knowledge held by people throughout the organisation towards achieving the business' long-term goals'.

The endeavours taken to conceptualise BSC have evolved BSC from a systematic performance measure to an enhanced strategy management system (R. Kaplan, 2009). The 'Balanced Scorecard' attracts extensive attention from the practitioners and academics. For instance, a figure of around 30% of BSC usage has been reported in China by Chow et al. (2007) and Rigby et al. (2007). A range of types of investigation on BSC has been conducted to examine its conception from the components of BSC performance measures to cause-effect relationships amongst those measures (e.g. Norreklit, 2003). Given the popularity of BSC, we have limited knowledge on one important fundamental issue with the exception of the following four studies: how is BSC implementation related to organisational performance? With the extension of BSC as an interactive control system, little empirical evidence is available regarding the effectiveness of BSC when it is interactively used in an organisational context, and a social environment.

Hoque and James (2000) were the first researchers to investigate how the use of the performance measures of BSC is related to organisational performance. Coming out of the survey on the performance measures used in the evaluation of performance, a major finding of the study was that firms on their usage of non-financial measures self-reported a better organisational performance to peers within the same industry. They used performance measures of BSC to examine weather BSC usage is linked to organisational performance, which implies BSC is utilised as a systematic indicators to measure performance. Whilst, BSC that has been labelled as an interactive system, it is unclear what the interactive effect of BSC with its environment is in managing uncertainties of organisational strategy. A similar concern was also expressed by later research by Davis and Alright (2004). They investigate whether bank branches implementing BSC outperform bank branches within the same banking organisation using key financial measures. They found evidence of superior financial performance for branches implementing the BSC when compared to non-BSC implementing branches.

Further research has been conducted by Malina and Selto's (2001) in an international manufacturing company to investigate the effectiveness of BSC as a strategy communication and management control system. Their research shows that BSC provides an effective way, in which, organisational strategy are communicated and integrated into other managerial capabilities to coordinate organisational goals. They found an indirect relationship between BSC's management control function and improved performance on BSC measures based on a positivistic field work. It was an extensive work which was

designed to provide objective evidence in support of the argument made by Kaplan and Norton (1996, 2000) that BSC is a complete, reliable strategy control system. Inconsistent with the expectation, however, was their findings which indicated that disagreement and tension between top and middle management regarding the appropriateness of specific aspects of the BSC as a communication, control, and evaluation mechanism. One possible reason for this finding is the lack of consideration on the appropriateness between BSC utilisation and its organisational context in generating and communicating information to manage organisational performance and uncertainties. For instance, whether the implementation of BSC is mutually fit with the organisational structure such as decentralisation; whether BSC is properly used by large size employees were not explored by Malina and Selto (2001).

Contradictory to the above positive evidence on the effectiveness of BSC, a negative relationship between BSC utilisation and outcomes, such as ROA, has been found in an extensive study of the financial services industry by Ittner et al. (2003). One possibility of the causes of these inconsistent results is that that sophisticated relationships between a MCS and its output are hardly to be drawn out only from using a simple regression analysis with an ignorance of its contextual factors to be a potential influential. This possibility can be explained and reinforced by the notion of contingency studies that the effective MCS is reliant on the extent to which MCS is appropriately fitting into the context it exists in (Grevin and Govin 2004).

The mixed evidence indicates some further investigation might be developed in helping us understand the effectiveness of BSC implementation. The further investigation may be approached from different perspectives, given the differentiated content of BSC at the different stages of its development. One possible approach is to conduct an examination using BSC as a system in the form of: performance measurement, performance management, and strategy management (Kaplan 2009). A system for management control is defined, as a unified system, because its separate pieces will be aggregated into information about the entity as a whole (Anthony 1965). A question might be raised regarding how the components of BSC, such as: performance measures and communication, are representatives of a unit in playing a function. A less effective approach, to some extent, may be performed by only using elements of BSC e.g. performance measures to be the research variables than using BSC as a system.

Another possible approach is to conduct an examination of interactive and diagnostic effect between BSC utilisation and organisational context on performance. A system can also be described in terms of its environment that is the nature of its elements and the forces affecting them at one moment of time, and its flow that is the interactions through time among the elements and between the system and its environment (Anthony 1965). For instance, how BSC utilised as a whole and BSC utilised as its components financial & non-financial performance measures and communication is interactive with its environment throughout its implementation.

While, few studies investigated how effective BSC utilisation is, a very limited number of studies in exploratory a contingency nature with regards to BSC utilisation and how it interacts with its context have been published (Chenhall 2003 for a review). Given BSC is an interactive strategy management system (Kaplan and Norton 2009), it is worth examining how, positive or negative, the identified contingency variables e.g. strategy are related to the utilisation of BSC. There are a large number of investigations on the

contingency nature of MCS in management accounting, which provides a potential ground to develop the current research question. For instance, the nature of the effective BSC utilisation might be deductive to have influence by Chinese unique environment e.g. coercions, under transient economy.

III. Conceptual framework and hypothesis development

Whilst preceding section has examined that contemporary Chinese transitional economical circumstance provides a possible context in properly understanding the phenomenon of the mixed outcome of BSC utilisation, it has been revealed in the literature that the study of PMS has theoretical flaws due to an uncritical use of contingency theory (Chapman, 1997; Robert H. Chenhall, 2003; Otley, 1980; Schoonhoven, 1981). The effect of using financial and non-financial performance measurement that might have a positive role on organisational performance when those measures have a fit with organisational characteristics e.g. strategy has been become an emerging research area that requests to be explored (C. D. Ittner & Larcker, 2009). Little research has been conducted to examine the inconsistent outcomes reality from BSC utilisation when from a contingency perspective (e.g. Robert H. Chenhall, 2003; R. Kaplan, 2009).

The contingency approach has been considered as one dominant paradigm in management accounting to understand the effective formalisation of MCS in context (Chapman, 1997; Robert H. Chenhall, 2003 for reviews). It is based on the presumption that there is no universally appropriate management accounting system which applies equally to all organisations in all circumstances. There are specific elements of a management accounting system which will match with any defined environment or appropriate variables, in terms of, contingency notions. The organisation should strive to attain a situation which fits these variables by arranging the factors it can control into an appropriate configuration that leads to effective performance. Effectiveness is not only an essential part of the contingency framework but also forms the criteria by which the effects of different configurations of controls must be evaluated (Otley, 1980).

It has been suggested that an effective MCS can be reached through a contingency fit between the utilisation of MCS and contingency variables (Gerdin & Greve, 2004 for a review). In the literature, it has been identified that the following major contingent variables have affected organisational performance: the environment (T. Burns & Stalker, 1961), technology (Woodward, 1958), organisational structure (W. J. Burns & Waterhouse, 1975), size (Blau, 1970) and strategy (Chandler, 1962). These contingency variables are commonly used to describe the complex ways organisations innovate a response to the design and implementation of MCS (e.g. Simons, 1995).

Indeed, the innovative process of BSC reflects a way in which strategy performance management system has been formulated in reliance on organisational context. The BSC was originally documented as a comprehensive performance measurement system to extend the scope of information merely provided by financial performance measures to relatively integrated information through a balance between financial and non-financial performance measurements for evaluating organisational performance. Whilst, it has been argued that objectively non-financial performance measures could become leading indicators contributing to financial performance, empirical results in the literature have not given consistent evidence of positive performance outcomes from the use of non-financial performance measures instead of the mixed results that have been demonstrated from their use (C. D. Ittner & Larcker, 2009 for a review). One possibility is that the mixed

consequence might be caused by examining the use of performance measurements without considering an interactive effect between performance measurements and context. It remains unanswered, however, regarding the extent of fit of their interaction of performance measurement and context impact on organisational performance (Robert H. Chenhall, 2003 for a review).

The first evolution of BSC is linking the performance measurements of BSC with strategy. This linkage brought BSC from a performance measurement system into a diagnostic performance management system. The diagnostic BSC uses strategy map implementing organisational strategy through the selected performance measures communicating the strategy within organisations followed by an analysis of performance to connect detected outcome of action to organisational strategies (R. Kaplan, 2009 for a review). The approach of diagnostic BSC not only responds to the demand of practices (R. Kaplan, 2009 for a review) but also reflects the findings in the literature that suggest that sophisticated, broad scope, integrated, aggregated and timely information has been demonstrated to be received / obtained from performance measurements or MCS in decentralised and large organisations in pursuit of strategic performance (e.g. Chia, 1995; Neely & Adams, 2002).

The BSC as a generic management tool reflects the preferences and expectations of its stakeholders including: customers, suppliers, employees and communities internalised in the strategy map through optimising long-term shareholder value. For instance, sustained shareholder value creation is included in the financial perspective as a high-level objective supporting sub-objectives for revenue growth, productivity and risk management. The desired customer outcomes such as to acquire, satisfy and retain targeted customers are included in the perspective of customer satisfaction in strategy map. Whilst organisational goals and objectives are defined by stakeholders that performance measurements can start with to be selected and designed for what each group expects from the corporation and how each group contributes to the success of the corporation in achieving goals and objectives (e.g. Neely & Adams, 2002; Waggoner & Neely, 1999), state-assets owners in China can define organisational goals and objectives so that the value of state-owned assets can be sustained and created through managing organisational strategy from the perspective of increasing shareholder's value and creating value for customers.

Whilst the mixed effects of BSC utilisation have been generated on performance, it might be the potential that a positive outcome of utilising BSC can be produced through an examination of combing BSC utilisation with its context for strategy instance. Given the identification of contingency variables in the management accounting literature, those variables as organisational characteristics are also applied to the organisations in the context Chinese manufacturing industry and a step at least can be taken to examine the effects of the extent of fit between BSC utilisation and contingency variables on performance might be positive. For instance, appropriateness of BSC implementing strategy for distributing strategic information in alignment strategy within organisations might have a positive impact on performance.

Given the function of a generic measurement and management system by BSC utilisation, it has the potential that a positive outcome can be generated through BSC properly utilised in its context from stakeholders value, customers value, to employees value that all can be reflected in how they contributed to the company's success in maximising long-term shareholder value. The mixed evidence of BSC utilisation on organisational performance (e.g. Christopher D. Ittner, Larcker, & Randall, 2003; Malina & Selto, 2001) may be caused

by the research design of simplifying BSC utilisation related to performance without a consideration of contingency variables that have been identified in the literature (Chandler, 1962) or other contextual variables e.g. state intervention that could be a potential contingency variable (e.g. Whitley, 1999).

Whilst an effective MCS can be reached through a contingency fit between the utilisation of MCS and contingency variables (Gerdin & Greve, 2004 for a review), an effective utilisation of BSC might be dependent upon a contingency fit between BSC utilisation and contingency variables. For instance, it has potential that organisational strategy may be effectively managed by BSC a strategy performance management system, which may positively contribute to organisational performance. It might be appropriate to examine how the effect that BSC utilisation has on performance is dependent upon organisational context or contingencies. A potential examination can be conducted to explore the relationship of BSC utilisation, its context where it operates, and performance. So far, little research has been conducted to explore the relationship between BSC utilisation and contingency variables (Robert H. Chenhall, 2003; R. Kaplan, 2009 for reviews). It is worthwhile to investigate how the extent of fit between the utilisation of BSC and organisational context related to enhanced performance and how and why those contextual factors influence the implementation of BSC.

Drawing on the notion of contingency studies, the interactive relationships between BSC utilisation and organisational contextual variables have potential to lead to enhanced performance. Theoretically, the interaction effect of the effect of BSC and organisational variables can be understood through defining either a moderator or a mediator (Gerdin & Greve, 2004 for a review). A moderation approach indicates that the impact of BSC utilisation on performance is contingent upon organisational contextual variables. Alternatively, mediation form suggests that BSC utilisation itself, apart from being contributors to performance, may also be dependent upon other variables / context e.g. strategy.

A potential mediating effect of BSC utilisation on the relationship of contextual variables and performance has been indicated by the conceptual foundations of BSC (R. Kaplan, 2009 for a review). The fundamental function of BSC is that comprehensive information is gathered and produced through its use of four dimensions of performance measurements in formulation and implementation of organisational strategy in its context. Stakeholders e.g. shareholders, employee, customers can define objectives for what they expect from organisations and how they contribute to the objectives (Neely & Adams, 2002). For instance, shareholders' value is a core element included in the dimension of financial perspective in strategy map reflecting organisational objectives and their strategy and would be expected to meet shareholders' propositions. The value propositions offered to win the loyalty of the customers that is needed to express objectives and strategy can be used to select and design performance measures for the perspective of customer satisfaction. The differentiated value propositions created and delivered through operation management are needed to meet the objectives of the internal process and the financial objectives in strategy map. The goals for employees, information systems and organisational alignment are described as objectives in the perspective of learning and growth.

The potential mediating effect of BSC utilisation has been strengthened by the literature (e.g. Cadez & Guilding, 2008). A number of studies indicate that the effect of

organisational context e.g. strategy on performance is indirectly mediated by management accounting system (Gerdin & Greve, 2004 for a review). Chong and Chong (1997) examined that the relationship of strategy, environmental uncertainty and performance are intervened by the information collected by management accounting systems. They found that broader, more integrated, aggregated information provided by management accounting system is positively related to performance in firms following prosperous strategy than in those with defenders strategy. Reliance on non-financial accounting information has been demonstrated to be mediating the relationships between organisational context changes e.g. strategy that lead to changes of other contingencies e.g. technologies and performance (Baines & Langfield-Smith, 2003). The mediating role of the usage of strategy management accounting on the relationship between organisational context and performance has been demonstrated by Cadez and Guilding (2008). In their findings strategy management accounting usage mediates organisational strategy, market orientation, size related to performance.

In this sense, the consequence of BSC interaction with its context might be generated through BSC appropriately mediating the relationship of organisational context and performance. The framework (summarised in Figure 1), is conceptualised to highlight BSC utilisation mediates the effect of organisational context on performance, apart from BSC utilisation itself being contributor to performance. That is to say, firms using the BSC approach, as a PMS, might have different outcomes from those not using BSC. For instance, with the assistance of BSC, as a PMS, the implementation of regulations, e.g. the issued state-owned asset performance measurement system, might be more likely to enhance organisational performance.

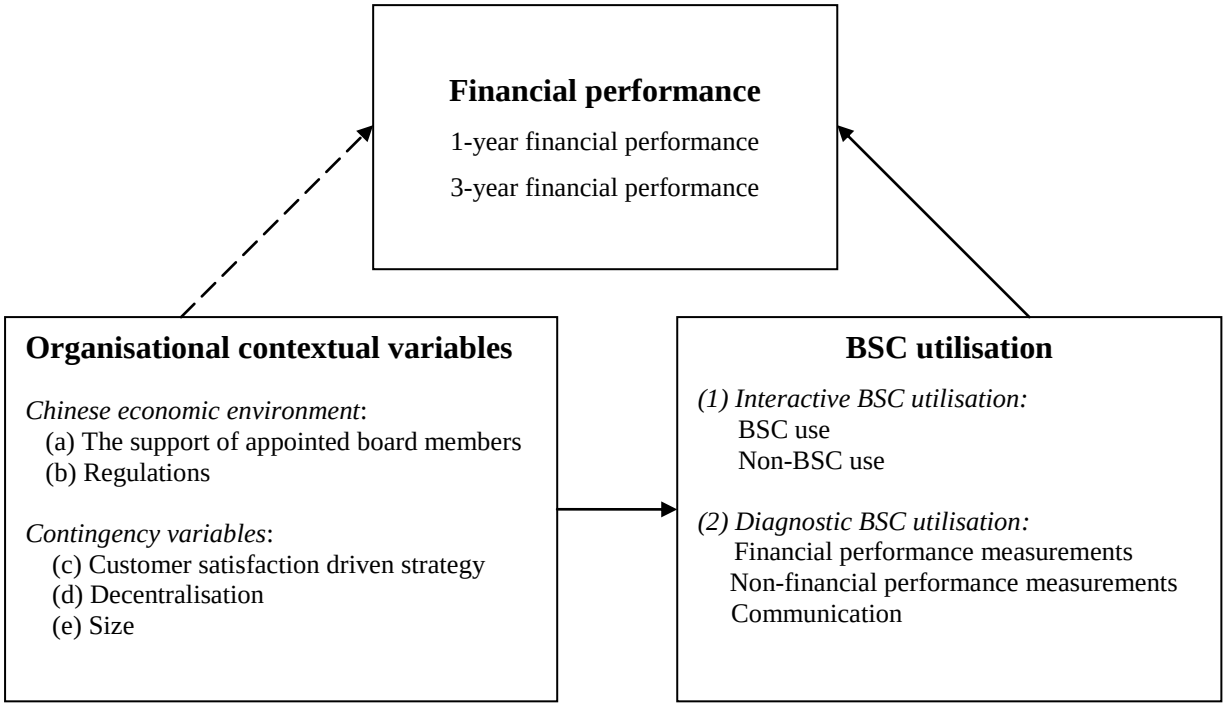


Figure 1 Mediation conceptual framework

In considering, possible performance enhancements, through BSC utilisation, the literature has suggested that it offers the potential to provide such enhancements (e.g. Malina & Selto, 2001). However, realising this potential is dependent on the extent, to which, BSC dynamically fits its function interactively with context. Five organisational contextual variables, included in the framework, are guided by the contingency studies in accounting. The identifications of contingency variables, for example: environment, strategy, size, decentralisation, technology, have been generally accepted in the accounting literature (Chapman, 1997; Robert H. Chenhall, 2003 for reviews). As shown in Figure 2, environment, strategy, size, and decentralisation have been included in the framework, the only exception being technology.

The exclusion of technology from this framework does not imply that there are no interactive effects of technology and BSC implementation on performance, either from a theoretical or a practical perspective. Rather, given the focus on the SPMS function of BSC utilisation in this study, the instruction of leaving technology as one potentially influential factor out of the framework through the priority given to other organisational characteristics probably leads me a subsequent research following this study.

The literature indicates that technology is the longest established contingency variable in management accounting research. Indeed, the utilisation of BSC can be influenced by the types of manufacturing technology used, for example: just-in-time, total quality management, and flexible management. This instruction is strengthened by the literature on operational management systems that demonstrate management control of manufacturing process can potentially be coordinated by other management systems, e.g. BSC, and can be integrated into far more ambitious information technology systems. An example of this is enterprise resource planning, where information system integration has been demonstrated to be positively related to performance, through the development of managerial competence (e.g. Christopher S. Chapman, 2005; Chapman & Chua, 2003; Chapman & Kihn, 2009).

Significantly, the environment, of this framework, distinguished from the defined aspects of environment in contingency studies, e.g. uncertainty of environment and the dynamical nature of the environment, refers to the changing Chinese economic environment, in which the Chinese manufacturing industry operates, and where the empirical investigation of this study was conducted. The unique characteristic of Chinese economic environment is a shift from an economy mode of central planning into one of market orientation economy. In contrast to the transition of economy in China, Chinese state-owned enterprises have been transferred into diversities forms but state-ownership still exists for state having rights to own and operate state-owned assets.

The Chinese state being an asset owner, on the one hand, can maximise the value of their assets via defining organisational objectives and strategies as a general shareholder, become a peculiar shareholder having differentiating power from the others coercing in maintaining national interests on the other. Chinese nation as one form of stakeholder can impact the formulation of enterprises' objectives and strategies that the selection and design of performance measurement can start with (Neely and Adams 2002). The Chinese nation as an assets owner can perform as a principal appointing agent to monitor the operation and management of state-owned assets as vast other investors and the managerial performance of agents can be evaluated and compensated on the basement of financial and non-financial performance (Christopher D. Ittner, et al., 2003; Waggoner & Neely, 1999). Chinese nation as a peculiar principal (an institution) have differentiating power from other principals for

instance governmental intervention to maintain national interests using a way in which institutional context e.g. state rules and policies impact the formulation of management control system (Whitley, 1999).

State intervention characterised as one feature of Chinese economic environment has the potential to be a contextual variable impacting performance mediated by PMS usage. The implications of PMS can improve transparency of the information relating to various performance parameters of these gradually denationalising SOE. The diffusion of new management tools, most importantly for this study being BSC, potentially play roles in the management of the effectiveness of state-owned businesses. Therefore, state intervention specified as regulations and the appointed board members can be recognised as two potential contingency variables affecting the mediation of BSC utilisation on performance.

Five contextual variables in the framework are reinforced by the literature relating to BSC where it has been argued BSC can be used as a generic interactive system forming a component, integrated and coordinated with organisational MCS for strategy execution (Kaplan 2009). Organisational strategy is formulated and updated within this system, whereby, the information generated and combined with internal operational data and external competitive data, launches another loop around the strategy and management control system. The implementation of strategy is conducted using a strategy map and a scorecard to design a customised interactive system for the translation and alignment and for controlling strategy execution. In addition, this interactive system requires frequent and regular attention from operating managers at all levels to interpret and discuss the way, in which, a scorecard measures, up and down the four perspectives, indicate the attributes of the measures by a scorecard make and the weights they add for their priorities to achieve organisational goals.

Hypothesis development

State intervention, BSC utilisation, and performance

State-owned assets are traces signalling the gradual transformation of state-owned enterprises into a variety of forms of organisations under the policy of SOE reform in China. The effective separation of state-ownership and state-owned assets operation & management is the central issue to be resolved in a way, in which, the value of state-owned assets is required to be kept or added by Chinese authority. State-owned assets are owned by the Chinese nation in the forms of full state-owned shares in SOEs, controlling and state-owned shares in other enterprises invested by big enterprises, enterprise groups, and holding companies; authorised to represent the State to manage state-owned assets and ensure the investors' full performance of functions. SOEs have become the extension of government organisations and they have right to appoint directors to be board members, who are representatives of the Chinese government, to monitor the operation of state-owned assets in non-SOEs e.g. share-holding enterprises.

State-owner as the principal who appoints agents to be the members of board has caused two distinguishing characteristics of Chinese enterprises' corporate governance. Firstly, State presenting active principal appointing agent has the potential to perform a dominant privilege to manage state-owned assets. Secondly, the appointed board members have the possibility to perform inside managers controlling with over power, which leads less effective mechanism for the operation and management of state-owned assets.

Under the first form, the goals of state and organisations can be consistently and effectively mobilised in pursuit of outputs. However, it has been argued that serious inside control problems exist leading personal benefits maximised such as political status rather than national benefit Lin (2004), while the appointed board members representing state are responsible for motivating and evaluating the managerial performance. One of issues caused by serious inside control is that evaluating managerial performance becomes difficult. The board members who are possibly involved in pursuing personal benefits pay less attention to managerial performance assessment so that managers have opportunity to control their activities. However, manager's performance assessment will depend on activities, the extent, to which they have control.

The issued regulations on the *performance measurement of state-owned assets* ("The regulation of state-owned capital's performance measurement system," 1999) have been considered as a way to help evaluate managerial performance through institutional influence the design and implementation of PMS in Chinese enterprises. For example, enterprises with a state-owned share, have the obligation in using a set of performance indicators including financial and non-financial performance measurements clearly highlighted for monitoring and controlling state-owned assets. The literature has suggested multiple signals used in performance evaluation might be provide more efficient means to motivate managers to act in the manner desired by the firms' owners in agency settings than only financial measures adopted for evaluation (e.g. Banker & Datar, 1989; Feltham & Xie, 1994). To the extent, non-financial performance measures provide information on managerial actions or organisational performance that is not captured in: current financial performance and the use of non-financial performance by boards of directors may improve corporate governance (Christopher D. Ittner & Larcker, 1997a). Non-financial measures may also be better predictors of long-term performance than financial measures, they may help refocus managers on the long-term aspects of their actions (Christopher D. Ittner & Larcker, 1997a).

Yet, despite the potential governance benefits from non-financial measures, few studies have demonstrated the types of measures, used by boards to evaluate managerial or organisational performance. One of the few studies undertaken has found no statistical association between the marketing measures used by managers and the marketing measures reaching the board (Ambler, 2000). The most recent investigation indicates the received perceptions from the board and managers on the key non-financial measurements use are largely different (Deloitte, 2007). Extremely, the negative mediating influence of political constraints from Chinese authority as owner influences the design of performance measures has been demonstrated in the O'Connor et al. (2006) study.

Furthermore, few studies have examined the relationship between the use of non-financial measures by boards and organisational performance; given considering accounting studies have been focused on corporate governance to explore its linkage to organisational performance (Larcker, Richardson, & Tuna, 2007 for a review). Ittner and Larker (1997b) found mixed evidence that the provision of quality measures to the board of directors influences performance, either directly or interacting with the organisation's quality strategy. Greater provision of quality information interacts positively with quality strategy to improve return of assets and sales growth. However, the provision of quality information to the board has significant negative main effects on computer industry accounting returns and no interaction effect.

In considering the practice in China and the literature, I will argue that state intervention plays its role through its interaction with BSC utilisation impacts on the enhanced performance. Grounded the principle-agent theory, this argument is strongly supported and interpreted by the notion that the goal of performance measurement and control systems are aligned with the goals of the agent with those of the principal. That is to say that BSC as one of organisational-oriented MCS, has the potential by using it to disclose comprehensive information on managerial performance to maximise the value of state-owned assets. BSC has been argued to be a component of organisational control systems synthetic with other management control systems and contexts in coordination with controlling strategies (C. S. Chapman, 2005). The utilisation of BSC might also have the potential to map maximum value of state-owned assets to coordinate organisational business activities at different levels and cross sections through combination with other control systems such as operational ones. BSC might combine financial with non-financial analysis, which gives full consideration of the non-financial factors that affect the results of an enterprise's operation, such as the abilities of the leadership, qualifications of the staff and competitiveness of its products. BSC may also comprises short-term and long-term indicators to monitor an enterprises' current financial performance, such as return on net assets and learning & growing investment, such as, long-term strategy for future development.

This argument is reinforced by the investigation conducted by Deloitte (2007). This investigation reveals that one of the barriers for managerial performance evaluation is caused by the underdeveloped analysis tools. For example these might include how non-financial measures are used, together with lack of internal and external accountability demands and familiarity with these measures. The representatives of shareholders or owner, boards of directors might, however, act as principals who are responsible for motivating and evaluating the performance agents, such as the organisation's executive. BSC utilisation has the potential to provide its function as a comprehensive strategy performance management system, interactively playing its role to satisfy state asset owners, professionals and clients. BSC also performs its function through synergy strategy formula and implementation, alignment strategy at the levels of firms and units, linkage strategy planning with operational execution, and coordination planning operations and monitor & evaluation. The contingency notion has confirmed this argument that organisational performance, potentially, relies on the extent, to which, BSC fits into its context, such as: state intervention completes its function. Therefore, the practices of Chinese enterprises and the above various arguments lead to the formulation of my first four hypotheses:

Hypothesis 1a: the support of appointed board members has a positive impact on the extent of the effect that BSC use in firms has on 1- and 3- year financial performance.

Hypothesis 2a: the support of appointed board members has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

Hypothesis 1b: regulations have a positive impact on the extent of the effect that BSC use in firms has on 1- and 3- year financial performance.

Hypothesis 2b: regulations have a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

Customer satisfaction driven strategy, BSC utilisation, and performance

The alignment of performance measurements and the chosen strategy associated with higher organisational performance has been limitedly studied in the literature of management accounting. Simons (1987) and Govindarajan (1988), for example, find higher performance in organisations following defender or low cost strategies when bonuses are based on budget targets. Govindarajan and Gupta (1985) also find that greater reliance on non-financial compensation criteria has a stronger positive impact in organisations following a build strategy than in those following a harvest strategy. Studies by Abernethy and Guthrie (1994), Chong and Chong (1997), and Bouwens and Abernethy (2000), among others, generally support the hypothesis that broad scope performance measurement systems are associated with higher performance in companies following prospector or differentiation strategies.

Yet, the knowledge has been gained solely through examinations on how terminology strategy related to performance measurements, which reflects one aspect of strategy planning in achieving organisational goal. Contemporary organisations face uncertainties of environment indicating that their competition can be gained no longer relying on 'stable demand for products, (and) high utilisation of factory capacity' (Samson et al. 1991), nor focusing on cost leadership (Abernethy and Lillis 1991). Rather, a combination of factors including not only low cost, but also quality, flexibility of product characteristics and effective supply has been considered to maximise customer value (Johnson 1990). While customer satisfaction has become one of the significant organisational capabilities in formulation of organisational strategy to achieve its goals (Ernst & Young 1991; 1994); implementing customer satisfaction initiatives are the challenge for organisational operation (Arthur Andersen & Co. 1994).

The mission and core value at Tsingtao[1] is 'to supply products satisfying the customers' and the strategy for achieving Tsingtao's mission and core value is 'to provide consistent tasting beer for customer'. This is because Tsingtao is using a customer satisfaction strategy to maintain the status of its top market share in the Chinese domestic market and increase competitive strength in global market. The customer satisfaction driven strategy as investigated in the present study is used to address the relationship of the impact of the interaction of strategy and BSC utilisation on performance for three rationales: firstly, a customer satisfaction strategy reflects the tendency of Chinese organisations operational characteristics under the context of a rapidly growing and competitive economic environment; secondly, a normative tendency leads to the emphasis on providing products which are satisfying to customers ("The law of customers' right," 1994); thirdly, the strategy is coherent between questionnaire survey and interviews undertaken as part of this study.

Notwithstanding, the few studies have examined empirically the links between customer satisfaction driven strategy, the use of performance measurements, and the enhanced organisational performance. Bouwens and Abernethy (2000) suggested that managers recognise the importance of receiving more sophisticated information to manage the interdependencies that stem from the pursuit of customisation (Bouwens and Abernethy 2000). Perera, Harrison & Poole (1997) found that positive association between customer-focused strategy and non-financial performance measurements but no links with

[1] Tsingtao is a Chinese Brewery Company, which ranks number one in Chinese market share. Field work for this study was conducted in this company through carrying out 15 in-depth interviews.

organisational performance. Ittner, Larcker & Randall (2003) also used customer-focused components for measuring organisational strategy to examine the linkage between strategies, measurements diversity, and organisational outcome. Consistent with the finding by Perera, Harrison & Poole (1997), their study indicates that firms emphasising non-financial performance measures predicted by strategies have been found leading an enhanced performance. Furthermore, no association has been provided on the alignment performance measurement system such as BSC linkage with strategies and performance.

Strategy has been identified as an influential contingency variable on the effective design and implementation of MCS based on different terminologies, for example: build-harvest strategy, cost leadership-product differentiation strategy (e.g. Govindarajan, 1984; Porter, 1980). Little examination has been undertaken, however, which has shown the linkage between customer satisfaction, BSC utilisation, and performance. Considerable discussion has been made regarding BSC conceptualised as a strategy performance management system, playing its role in alignment of organisational strategy, operational management, and performance management around the four BSC dimensions. It has been suggested that customer satisfaction would include objectives for desired customer outcomes, such as: acquisition, satisfaction and retention of existing and potential customers. Additionally, expansion of the share of their spending done by customers can be a company aim as well as: provision of effective delivery, post-sale service, and to provide efficiency products with relative low cost or differentiated innovations (R. S. Kaplan & Norton, 1996b, 2004). While customer satisfaction management is one essential component in BSC coordinated strategy and synergy with other components of BSC and other control systems, the management of customer relationships is considered as one of the primary capabilities, by which to achieve an organisations' goals. Therefore, my fifth and sixth hypothesis is to predict:

Hypothesis 1c: firms driven by customer satisfaction strategy have a positive impact on the extent of the effect that BSC use in firms has on performance.

Hypothesis 2c: firms driven by customer satisfaction strategy have a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

Decentralisation, BSC utilisation, and performance

Centralisation and decentralisation are considered as organisational structures for the extent to which discretion within organisations and decentralised authority has been commonly considered as one aspect leading to differentiated activities (Robert H. Chenhall, 2003 for a review). The delegation of authority down through organisations, involves a balance, between allowing each organisational sub-unit the independence to react to its environment through the need to control and integrate the work across divisions. Decentralised organisations are used to ensure there is effective integration between activates of differentiated sub-units and between sub-units' activities and corporate goals or strategies. Chenhall and Morris (1986) found that decentralised organisations were identified as perceiving aggregated and integrated information as useful. Managerial performance was associated with the interaction between decentralisation and each of the characteristics of broad scope, integrated, aggregated and timely information received and obtained (Chia, 1995).

Given the evidence demonstrated by the literature, BSC has the potential to link strategy and operations as an appropriate integration control system in providing open and broad

information. It has also been claimed that one major benefit from BSC stems from the construction phase as it indeed helps in specifying, communicating and linking strategic objectives and measures and setting targets and aligning strategic initiatives both upwards and downwards within organisations (Tuomela, 2005). The function of BSC has been extended as an integrated and comprehensive close-loop management system with complex constituents and interrelationships and requires simultaneous coordination among all organisational lines and staff units (R. Kaplan, 2009). The information on the various activities for strategy development, planning, alignment, operational planning, operational control and strategy control integrated; within a closed-loop, comprehensive management system. The decentralised authority has the potential for combination with MSC, such as BSC, to provide for effective integration and coordination that align strategy and operations across functions and business units; deploying extrinsic motivation by aligning employees' personal objectives and compensation to strategic objectives in the enhancement of performance. Thus, my seventh and eighth hypothesis expects:

Hypothesis 1d: decentralised firms have a positive impact on the extent of the effect that BSC use in firms has on 1- and 3- year financial performance.

Hypothesis 2d: decentralised firms have a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

Size, BSC utilisation, and performance

Size has been thought of a factor in improving organisational efficiency and market position, providing labour opportunities when during growth phases. Large organisations tend to have more power than small or medium ones in controlling their operating environment, employing: large scale mass manufacture techniques when facing task uncertainty. Few studies in management accounting have considered size as a contingent variable and generally studies have considered size together with other elements of context such as: technology and product diversity. Khandwalla (1972, 1977) found that large firms were more diversified in product lines, employed mass production techniques, were more divisionalised and made greater use of sophisticated controls and environmental information gathering such as forecasting and market research. Bruns and Waterhouse (1975) gave evidence about the relationship between organisational structure and size and identified two forms of control associated with size: administrative with large firms and personal with small firms. Merchant (1981) demonstrated that large, diverse firms were more decentralised, used sophisticated budgeting techniques in a participative way and employed more formal communications.

In considering the literature, large organisations have tendency to use BSC with the potential to enhance performance. The number of individuals is commonly used to measure organisational size in the management accounting literature (e.g. Libby & Waterhouse, 1996). It is strengthened by the Ahrens and Chapman's (2005) study. They use the case of a restaurant chain to illustrate the actions of individuals can be interactively bridged and emphasised by the practices surrounding the strategic uses of management control information. They point out that durable and overarching objectives can be constructed to motive individuals' actions through highly varied use of MCS. Therefore, the final two hypothesis developed to be tested in this study is:

Hypothesis 1e: larger firms have a positive impact on the extent of the effect that BSC use in firms has on 1- and 3- year financial performance.

Hypothesis 2e: larger firms have a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

IV. Research design

1. Research methodology

Research methodology involves considerations whether: "social reality is emergent, subjectively created, and objectified through human interaction" (Chua, 1986, p. 615) or as Hines did (1988, 1991) as: "social reality objectively exists and is verified in empirical scientific methods". The ideographic and nomothetic approaches may best be seen as representatives of epistemologies which might be used to approach social reality from different perspectives. The distinction between the two methodologies in the context of the study was first made by Gordon Allport (1937, p. 22):

> "*the nomothesis approach…seeks only laws and employs only those procedures admitted by the exact science. The ideographic sciences… endeavour to understand some particular event in nature or in society.*"

The debate between these two approaches is about the analysis of the subjective accounts obtained by participating or getting inside the situation as in the ideographic approach, or whether it involves objectively testing of hypotheses as in the nomothetic approach. The ideographic approach is based on the view that one can only understand the social world by obtaining first-hand knowledge of the subject under investigation. It thus places considerable stress upon getting close to one's subject and emphasises the analysis in the subjective accounts, which one generates by "getting inside" situations (Burrell & Morgan, 1979). The nomothesis approach is based on research protocol and a technique, such as, experimental observation. It is epitomised by the approach and methods employed in the natural sciences; it is preoccupied with the construction of scientific tests and the use of quantitative techniques for the analysis of data. The nomothetic method is designed to develop a universal knowledge theory (Burrell & Morgan, 1979). Use of the ideographic and nomothetic approaches in accounting are sometimes referred to by other terms, such as qualitative methodology (ideographic) versus positivism/quantitative (nomothetic) approach (Ahrens & Chapman, 2006).

Contingency-based studies have a long-term tradition to be considered, as a stream of positivistic research using the method of questionnaire survey (e.g. Khandwalla, 1972). In management accounting research, surveys are most commonly employed for theory testing and, over the past 20 years, 30 % of all published empirical management accounting research has used the mail survey method (Van der Stede, Young, & Chen, 2005). In social science, the questionnaire survey has been considered as a method having advantages for collection of a large sample data set, and it is particularly suitable for the generalisation of the findings based on the examined hypothesis following a rule appropriately and widely. The nomothetic research methodology is used to approach BSC utilisation with the research methods of a questionnaire survey. BSC utilisation will be approached following the contingency notion and the information will be sought using a questionnaire survey to provide complementary evidence.

2. Survey sample

The targeted survey sample for questionnaire survey distribution was obtained through a list of executive MBA alumni, at a Chief Financial Officer (CFO) training course and at the China Securities Regulatory Commission. CFO training courses are held in two National Accounting institutions organised by the Chinese Finance Ministry, which provides a large number of courses for enhancing the capabilities of managers in Chinese enterprises. China Securities Regulatory Commission is the managerial ministry of the Chinese stock market and the main security and finance regulator in China.

The targeted 550 Chinese manufacturing companies were randomly selected from the above list and accessed to represent the companies. The targeted respondents were 550 senior managers selected for each 550 Chinese manufacturing companies. Questionnaires were administrated in two stages: one in the winter of 2005 followed by one in the summer of 2006. Respondents at senior level (e.g. CFO, CEO) are more likely to be knowledgeable about the investigated organisational level issue of BSC utilisation. Each representative company was asked a combination respondent as one person is often difficult to reflect an entire perception on an organisations management e.g. CEO who is possibly lack of the specific information such as financial numbers. The combination respondent for each questionnaire was recommended by a CEO in the pre-testing. A reliance on one individual often can not reasonably reflect the whole angle of organisation, which weakens the validity of the study (S. M. Young & Selto, 1991).

The questionnaire survey was administrated using a version of Dillman's (2000) mail survey method. The questionnaire was first developed in English before being translated into Chinese. Pilot testing involved a few academics and CFOs in China who were asked to complete the questionnaire to determine whether contextual changes were needed to be readable and understandable. In terms of feedback, a small number of changes were made, for example, questions on performance percentages of company growth were used instead of asking for a numeric number; the information of budget control was also added into.

Three hundred questionnaires, which were to be completed in class, distributed at the end of 2005 to two separate executive MBA groups across two Mainland Chinese universities and one CFO training course in Shanghai Accounting Training Institution. Some 151 completed questionnaires were returned; 37 questionnaires were non-usable for various reasons (e.g., some missing answers). This left 114 usable responses. The respondents represented a range of senior level managers including: general managers in the financial department (n = 35), CFO (n = 43), CEO (n = 24) and others (n=12).

One hundred and sixty questionnaires were distributed in the summer of 2006 through two CFO training courses in the Beijing Accounting Training Institution. Some 90 questionnaires were also distributed to Chinese listed companies. Some 164 completed questionnaires were received altogether, of these 31 questionnaires were non-usable for various reasons (e.g., some missing answers), leaving 133 usable respondents. The respondents represented a range of senior level managers, including general managers in financial department (n = 4), CFO (n = 100), CEO (n = 5) and others (n=24).

In total, 550 questionnaires were distributed and 315 completed questionnaires were received, of these 68 questionnaires were non-usable for various reasons (e.g., some missing answers), leaving 247 usable respondents, representing a 44.90% response rate. Tabachnick and Fidell (2001) argue that with reasonably large sample, for example, over

200 cases, skewness will not 'make a substantive difference' in the analysis. The sample size of 247 is quality to be used for testing as it is over the median size is 125 reported by Van der Stede et al. (2005). The response rate of 44.90% is acceptable, as the average response rate of 36% was reported by Van der Stede et al. when top managers and organisational representatives are involved in filling out a survey.

Out of the 247 selected sample as shown in Table 1, 126 (51%) of respondents were from state-owned companies[2]; others include 50 share listed companies (20.2%), 25 joint venture companies (10.1%), 20 share cooperative companies (8.1%), 15 private companies (6.1%) and finally 7 collective companies (2.8%). The majority of respondents from state-owned companies are consistent with the Chinese economic background.

Bias testing

Data collection proceeded in two stages: in the winter of 2005 and the summer of 2006. Some 550 questionnaires were distributed to 550 managers in different organizations. Some 330 questionnaires responses were received: 247, of which, were usable[3]. The effective response rate was therefore 44.9%. In order to check any potential non-response bias, Armstrong and Overton (1977) and Lambert and Harrington (1990) recommend comparing the last quartile respondents with the first quartile respondents. A series of t-tests were conducted for all the items in the questionnaire measured on the Likert-scale. The results in Appendix C shows that most assessments yielded no significant differences ($p>0.05$), which indicate 247 responses can be used to predict non-response sample.

When the instruments were designed for data collection, common response bias issues were considered. Young (2000) argues that the question of assessment and self-reporting arises with any attempt to collect and analyse data using a survey. Several approaches were used to minimise this issue. For instance, different response scales were adopted for the different sets of items that pertain to each item. Thus 1-5 and -3-3 scales were used for the 25 items in questionnaire to check the bias of respondents. The first scale asked respondents to state the extent to which each factor influenced the design and operation of the company's PMS (scale: 1=No influence; 7=Extremely influential). The second scale asked respondents to rate the effect each factor was considered to have had on the design and operation of the company's PMS (-3=Extremely detrimental, and +3=Extremely beneficial). The results of the questionnaires returned show no significant differences between those different scales used.

Measurements

The questionnaire contained questions about the extent of BSC use, as well as questions which sought to identify potential influential factors on BSC utilisation. The questionnaire was divided into three sections seeking information regarding the following:

- Information on company characteristics;
- Performance indicators;
- The potential influential factors on PMS in the company;

[2] The Chinese Statistical Yearbook (2005) classifies Chinese companies into state-owned, collective, private, share cooperative, share listed, and joint venture.

[3] A number of questionnaires had to be discarded because of incompleteness.

Each section contained items that asked for responses on a 3-, 5- or 7- point Likert scale. For some of the items such as company performance, responses were sought relating to the three year period 2002-2005. Choice of the 3-year time span was based on existing findings that such a time frame is needed to capture changes in organisational systems and practices (R. H. Chenhall, 1997; Simons, 1987).

Performance management style

The information of performance management style was sought using questions on a seven-choice scale to measure respondents' perceptions as to the style they are adopting for performance management in the company. The first four choices were to ascertain, the extent to which, the performance measures, designed to monitor the key areas of the business (e.g. financial performance, customer satisfaction, and internal growth), were balanced from a separated and unrelated style to the balanced scorecard style. The fifth is the performance management system of state-owned assets regulated by the Chinese authorities. Economic value added (EVA) and other style are the last two choices. As the focus of the current study on BSC utilisation and the conceptualisation of interactive and diagnostic BSC utilisation, the measurement of PMS style is coded as a dummy variable, i.e. BSC use as 1 and non-BSC use as 0 to define BSC as an interactive system.

The questions relating to PMS style are comprised of the number of performance measures and the years this PMS style had been used and performance measurements. In this survey, the number of performance measures refers to how many measures are used at different levels, including: company level, departmental / business unit level. Information was also sought on how many years the company had been using its PMS. An open question asked respondents about the extent, to which, they thought their organisation would be likely to use BSC, in the next three years. The information regarding performance measurements are presented as a separate part as follows.

Performance measurements

Performance measurements were extended from Kaplan and Norton's (1996) 24 indicators around four dimensions and Ittner et al.'s (2003) measures with the added indictors, to reflect Chinese company practice, 40 items being devised for the four dimensions of BSC. Each question in this section was measured on a five-point Likert scale (1 = not important to 5 = extremely important).

A two factor rotation solution was extracted for the financial dimension, which accounted for 59.94% of the total variance explained. The Cronbach (1970) alpha scores in Table 2 are above 0.60 for the two variables, which is acceptable for an exploratory study (Nunnally, 1978). These two variables are called income measurement and cost measurement respectively. The component of income measurement and cost measurement is called financial performance measurement.

Similar to the financial dimension, the results of the factor analysis on other three dimensions are reported in Table 2. The results in Table 2 indicate that this analysis is appropriate for the dimension of customer satisfaction, accounted for 69.21% of the total variance, explained the two variables' alpha scores, being acceptable for this study named the effective post-sale support measurement and the fast and reliable delivery measurement. Two variables were also discovered for internal process dimension at the statistical acceptable level accounted for 54.41% of the total variance explained and called the manufacturing efficiency measurement and the product quality management measurement.

For the dimension of learning and growing, the safety management measurement and the sustainability measurement were extracted to be acceptable at the statistical level accounted for 59.01% of the total variance explained. The components of the three dimensions are called non-financial performance measurements.

Communication

A five-item instrument was devised to measure respondents' perceptions of the extent, to which, communication was used in their firms. This instrument was measured applying the communication function, provided by an interactive management control system, defined by Simons (1990) and the communication role played by the regulations (1999). A five-point scale ranging from 'no influence' to 'extremely influence' was used. The rotation for these items, as reported in Table 3 indicates the explanation of 69.27% with the acceptable reliability rate 0.886. This component includes, the ways in which, the information is communicated through using internal newsletters, team-building workshops, further promotional efforts, to open communication barriers between divisions and business partners, a number of employee communication meetings, number of customer communication meetings within divisions, groups, top to bottom. This component is called communication.

State intervention

A six-item instrument was devised to measure respondents' perceptions of the extent, to which, the stakeholders, potentially, influenced the utilisation of BSC. A two-factor rotation solution was extracted, which accounted for 67.31% of the total variance explained. Similar to the preceding analysis, the results of the factor analysis shown in Table 4 also indicate that this analysis is appropriate for this instrument, and the two variables' alpha scores being acceptable for this study. The first rotated component reflects stakeholders including shareholders, the board of directors, and the supervisory board who influence the choice of PMS directly. The second component includes governmental regulations and policies, governmental edicts, and the regulation of state-owned capital performance measurement that impact upon the choice of PMS indirectly. Thus, the present analysis will focus on two variables to reflect interest groups, namely, the support of the appointed board members and regulation.

Company strategy

Company strategy was measured, applying an instrument adopted from one developed by Govindarajan (1986). A five-point scale ranging from 'not important' to 'extremely important' was used. A three component solution was discovered. A three-factor rotation solution was extracted, which accounted for 56.34% of the total variance explained. The first component was used as the focus of the current study on customer satisfaction that indicates satisfying quality product and service and an acceptable reliability rate of 0.792 was gained for this rotation of items. This component is called customer satisfaction driven strategy.

Decentralisation

Decentralisation was measured, applying an instrument adopted from one developed by Govindarajan (1984, 1986). A five-point scale ranging from 'no delegation' to 'full delegation' was used. A two-factor rotation solution was extracted, which accounted for 63.360% of the total variance explained. The first component was used as the items including the authority distributed within the manufacturing division; the rotation for these

items indicates the acceptable reliability rate 0.849. This component is called decentralisation.

Size

The size of respondents' firms was measured using the number of employees. This is a commonly applied measurement for size in the management accounting literature (e.g. Robert H. Chenhall, 2003; Libby & Waterhouse, 1996). The number of employee by the end of 2005 was used to ask respondents fill out in the questionnaire. This component is called size.

Performance

Performance was measured applying an instrument developed by Govindarajan (1984). Respondents were asked to rate the performance of their organisation upon three dimensions over the past three years. A five-point scale, ranging from 'very low' to 'very good' was used. The rotation for these items indicates an explanation of 80.40%, with an acceptable reliability rate of 0.891. This component is called 3-year financial performance and 1-year financial performance.

Table 5 reports the descriptive statistics for the dependent and explanatory research variables, which include: theoretical range and actual range, minimum and maximum values, means, and standard deviations of each variable. Table 6 presents the Pearson Correlation Coefficients for the research variables. The results presented in Table 6 suggest that a large number of the correlations between dependent variables and explanatory variables are over 0.3. Pallant (2005, p. 149) argues that independent (explanatory) variables show, at least some, relationship with the dependent variable, if their correlation coefficient is above 0.3.

V. Empirical analysis

1. Descriptive analysis of survey

Description of performance management style

Table 7 presents the descriptive statistics relating to PMS use obtained from the questionnaire of the respondents' perception with respect to their companies. Some 23 companies were found to use BSC that is, 9.3% of Chinese companies have adopted BSC for managing performance. The average number of years of BSC utilisation reported in Table 7 is 2.67 with a 1.197 year standard deviation. Compared to other PMS usage in Chinese firms, BSC has been used for a relatively shorter period of time than other PMS approaches. An increasing tendency towards BSC utilisation is revealed in the survey, that is, 11.1% firms were planning to use it in the next three years and with an average number of years of BSC utilisation by Chinese firms was 1.91 year with a standard deviation of 0.563. The performance influence of BSC implementation is suggested in the survey, that is, the average affects by BSC utilisation on performance is 2.37 (1-5 scales used: 1 refers to no influence; 5 to extremely influence) with a standard deviation of 1.097.

While those companies answering c (88) in Table 7 are clearly employing a systematic set of measures, Category d (53) the state-owned capital PMS is also akin to a BSC approach for performance management (see State-Owned Capital performance system regulation, Chinese Finance Ministry, 1999). The remaining 34 companies may also be considered to

be employing a range of measures, with the balanced weighting given over to measures of performance. In effect, 198 (34+88+23+53) companies, categories b, c, d and e, comprising 80.2% of respondents, could be described as taking an approach to performance management as a BSC orientated PMS.

Description of the performance measurements of BSC

Using the sub-sample of 23 firms which claimed to use BSC, eight performance measurements have been discovered to comprise principle components of BSC dimensions (Table 8). Table 8 suggests that two principle components were rotated and extracted from the measures of financial dimensions with the acceptable reliability at the statistical level. These two components are called cost indicator and income indicator. Similar to the financial dimensions, two components called effective post-sales support indicators and fast and reliable delivery indicators were extracted to be statistically and reliably accepted for the customer satisfaction dimension of BSC. The measures of internal process dimension were revealed to be two principal components named manufacturing procedure efficiency indicator and product quality management indicator at the level of acceptable reliability. Two principal components were discovered for the dimension of learning and growing and called safety management indicator and sustainability indicator with the acceptable reliability at the statistical level.

The results in Table 8 reveal that the eight components of the BSC dimensions each show a different weight. The highest weight is 27%, for the indicator of safety management. The weight of 27% is almost twice as high as the 15.6% weight for the second ranked indicator of employee safety. The difference between these two components indicates the safety of employee has become a leading business activity managed in Chinese firms. Similar to the extent of using employee safety, the indictors of income and manufacturing procedure efficiency are used with the weights of 15.51% and 14.9%. The lowest indicator weight is 7.3%, for both effective post-sales support and sustainability indicators. Comparing the weighting of dimensions in Table 8 with those suggested by Kaplan and Norton, the biggest difference between them is the learning and growing dimension, with the proportion of around 10%. This difference provides an explanation to the fundamental argument for BSC concept by Kaplan and Norton, which is learning and growing dimension, as one aspect of non-financial performance measurement, leading organisational performance.

The rotated results of performance indicators between the sub-sample of 23 BSC users and the full sample size of 247 are both presented with eight cluster performance measurements in Table 8 and Table 2. One possible explanation for this similarity is that 198 out of 247 firms are BSC orientated PMS users that represent 80.2% of companies' PMS approach and are influenced by the notion of BSC. For instance, 34 companies in Table 7 considered themselves to be employing a range of measures, with the balanced weighting given over to measures of performance. The State-Owned Capital PMS, adopted by 53, firms is also akin to a BSC orientated approach to performance management.

This similarity can also be interpreted through reference to the existing management accounting literature. 8 performance indicators adopted General Motor are the originality of BSC (Kaplan 2009). 24 measures for BSC dimensions and the weight given to each dimension have been generalised by Kaplan and Norton (2001) (see Table 3.2). Subsequently, DeBusk et al. (2003) reduced these 24 measures to 18 and further compressed them into eight components in their investigation based on a brewery company.

However, the weight for the eight components is not identified in the investigation of DeBusk et al.'s (2003).

The curiosity of seeing if there is a significant difference on performance measurements between those firms using BSC and those non-BSC users from a statistical perspective leads me a test. The test could reveal those firms, not adopting BSC as their PMS approach, may also use the performance measurements of BSC like approach. To compare the difference between those firms using BSC and those non-BSC users on the usage of performance indicators, Levene's test is used to test equality of error variances (Tabachnick & Fidell, 2001). A significant value of less than 0.05 suggests that the variance of PMS across groups is not equal.

Levene's test is conducted using eight performance indicators, as dependent variables and performance management system as independent variable, two groups of PMS recognised with BSC coding 1 and others coding 0. The results of Levene's test are presented in Table 9. The results of significance level for eight performance measurement are greater than 0.05 that suggests using performance measurements for the entire sample has not violated the homogeneity of variances assumption.

2. Survey sample mediation analysis

Mediation effect analysis

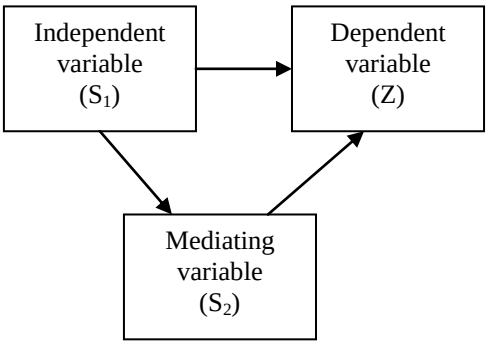
It has been argued that the indirect effect of independent variables on dependent variables can be examined through the introduction of a mediating variable (Gerdin & Greve, 2008). Mediation effects between organisational context and MSCs on performance tend to explain the management phenomenon systematically. The simplest mediation effect form is presented in equation 2 and Figure 2. Fit exists when the impact of S_1 on Z operates through S_2 and in path analysis, fit is depicted as a statistically significant indirect effect (Gerdin & Greve, 2004).

Equation 2: $Z=ß_1S_1$

$Z= ß_2S_2$

$S_2=ß_3S_1$

Figure 2 Mediation form of fit*



* Note: source of Figure 2: Gerdin and Greve (2004)

The appropriateness of using the analytical method of structure equation modelling (SEM) to examine the proposition of the mediating effects of contextual variables through interactive and diagnostic BSC utilisation, in this study, is thought of to be one more respondent to the advocated SEM approach. The technique of SEM has been considered particularly useful, when one dependent variable becomes an independent variable in subsequent dependent relationships (Hair, Anderson, Tatham, & Black, 2006). Greater use of SEM has been called for to overcome some of the limitations of traditional statistical techniques such as multi-regression analysis (J. F. Shields & Shields, 1998; M. D. Shields, 1997; Smith & Langfield-Smith, 2004). While, partial least square SEM, has been used in a number of studies in management accounting (e.g. Chapman & Kihn, 2009; R. H. Chenhall & Morris, 1986), covariance-based SEM, is particularly appropriate for modelling relations between: environment, strategy, and organisational structure; because there is a well-established relationship and a considerable body of knowledge exists in this field (Smith and Langfield-Smith 2004).

The power of SEM, in this study, is exhibited in the way, in which, the analysis of SEM firstly starts with a proposed measurement model. A measurement model specifies relations between manifest items (observed values for specific survey questions, for example, items of performance indicators) and the latent constructs, that they represent (i.e. unobserved values defined as the sum of their respective indicators, for example: financial indicators and non-financial indicators). Following the factor analysis for each of the research variable measures, the preliminary analysis of Multi-dimensionality for SEM was carried out with AMOS 6.0 (Analysis of Moment Structure) in the constructs, including: the support of appointed board members, regulations, customer satisfaction driven strategy, decentralisation, size, BSC use and non-BSC use, financial and non-financial measurements, communication, and 1- year and 3- year performance.

The proposed measurement models for the constructs are assessed through the content to which a good fit is observed between them and the data using the goodness-of-fit criteria (Anderson & Gerbing, 1988). An assessment of goodness-of-fit is conducted for the measurement model by the Chi-square test, and heuristically by a number of goodness-of-fit indices: the goodness-of-fit index (GFI), the root mean square errors approximate (RMSEA), the incremental fit index (IFI) and comparative fit index (CFI) (Anderson & Gerbing, 1988; Bollen, 1989; Bryman, 2001). The results of the measurement model for the: constructs and the financial and non-financial performance indicators, are reported in Table 10 and Table 11 as the second-order measurement model has been used to evaluate the unidimensionality and convergent reliability. The rest of constructs were evaluated using the first-order measurement model. The bi-variate correlations of the factors or the variable scores provide an initial indication of the relationships between the measured and latent variables (presented in Table 12).

The summarised evaluations using second-order measurement model on financial and non-financial performance indicators are reported in Tables 8 and 9. Both Tables show the goodness-of-fit indices, that suggest, the proposed measurement model has achieved a good fit with unidimensionality and convergent validity. The two models are also reliable with composite reliability and Average Variance Extracted (AVE) beyond the cut-off points: 0.60 for composite reliability (R. Bagozzi & Yi, 1988) and 0.50 for AVE (Fornell & Larcker, 1981). Table 11 shows the factor loadings for each of the five constructs. All of factor loadings of the measurement instrument, exceeded the 0.3 level and were very highly statistically significant level of $p<0.001$. The good-of-fit indices were within tolerable ranges for GFI, RMSEA, IFI, CFI.

While extensive study on financial and non-financial performance measures have been carried out (e.g. Ittner et al 2003) and three or even more dimensions are specified for measurement of non-financial performance (Kaplan and Norton 1992 1996), we know little about the validity of multi-dimensionality with regards to this. The measurement of product quality has been dropped to achieve the goodness-of-fit. The empirical results of dropping the measurement of product quality indicate a support that is the following evaluation for BSC on coordination of the strategy management function with operational management. The unidimensionality and convergent reliability and validity of performance indicators, constructed financial measures, and non-financial measures using second-order measurement models of around four dimensions are evident to be the latent constructs.

Given, the primary goal was to estimate relationships between financial and non-financial performance measurements and other constructs while increasing estimation model parsimony, a partial aggregation approach (R. P. Bagozzi & Edwards, 1998) was taken to represent the multi-dimensionality of financial and non-financial performance measurement construct. Taking these factors into account, it was determined that the measurement model holds and therefore the analysis will be progressed to testing the structural model in the following.

Following the evaluation of measurement models, the power of SEM is strengthened in a way, in which, the structural model is used to estimate dependence relationships, direct and indirect path interrelationships (Hair, et al., 2006). The estimated dependence relationships among the reliable and valid latent constructs simultaneously are rarely achieved using other statistical techniques e.g. multiple regression techniques (Hair, et al., 2006). The mediating or indirect effect of five contextual variables on performance in this study is

propositioned using a structural (hypothetical) model incorporation the set of exogenous variables e.g. financial indicators and endogenous variables e.g. 1-year financial performance in the model, as well as the direct effects connecting them, such as interactive BSC utilisation, and the disturbance terms for these variables (Mueller, 1996). An assessment of goodness-of-fit is conducted for the entire structural model by the Chi-square test, and heuristically by a number of goodness-of-fit indices: GFI, RMSEA, IFI and CFI (Anderson & Gerbing, 1988; Bollen, 1989; Bryman, 2001). Each path coefficient tested respectively for the propositioned mediation relationships were assessed using the t-value accompanying a path coefficient.

Analysis of mediation effect testing results through interactive BSC utilisation

The structured model was used with a series of nested modes beginning with the least constrained model, to test the mediating (indirect) effect of five contextual variables through interactive BSC utilisation on financial performance. Following the procedure that Andeson and Gerbing (1988) suggested, I computed the Chi-square value difference between each nested model and tested them for significance by taking into account the difference in the degrees of freedom. As a rule, if change in the Chi-square is not significant, the model with the constrained path is a better fit. A significant change in the Chi-square indicates that, the constrained path should not be removed. I continued this process until no further improvements could be made and the model was the most parsimonious explanation of the data. The results of the structural model are summarised in Figure 3. In this figure, the overall model was assessed using the goodness-of-fit indexes that suggest a good fit has been achieved within tolerable ranges (e.g. for GFI, RMSEA, IFI, CFI) and the path coefficients were calculated to test the relationships among five contextual variables, BSC use, and 1- year and 3- year performance.

As shown in figure 3, the research model tests five contextual variables have a positive impact on the extent of the effect that BSC use in firms has on 1- and 3- year financial performance (hypothesis 1a-e). The SEM results in figure 3 indicate that the associations between the support of appointed board members, regulations, customer satisfaction driven strategy, decentralisation, size and BSC use (0.026, -0.009, 0.008, -0.015, 0.010); between BSC use and 1- & 3- year financial performance (0.025, -0.058) are close to zero and insignificant. These results provide no support to hypothesis 1a-e.

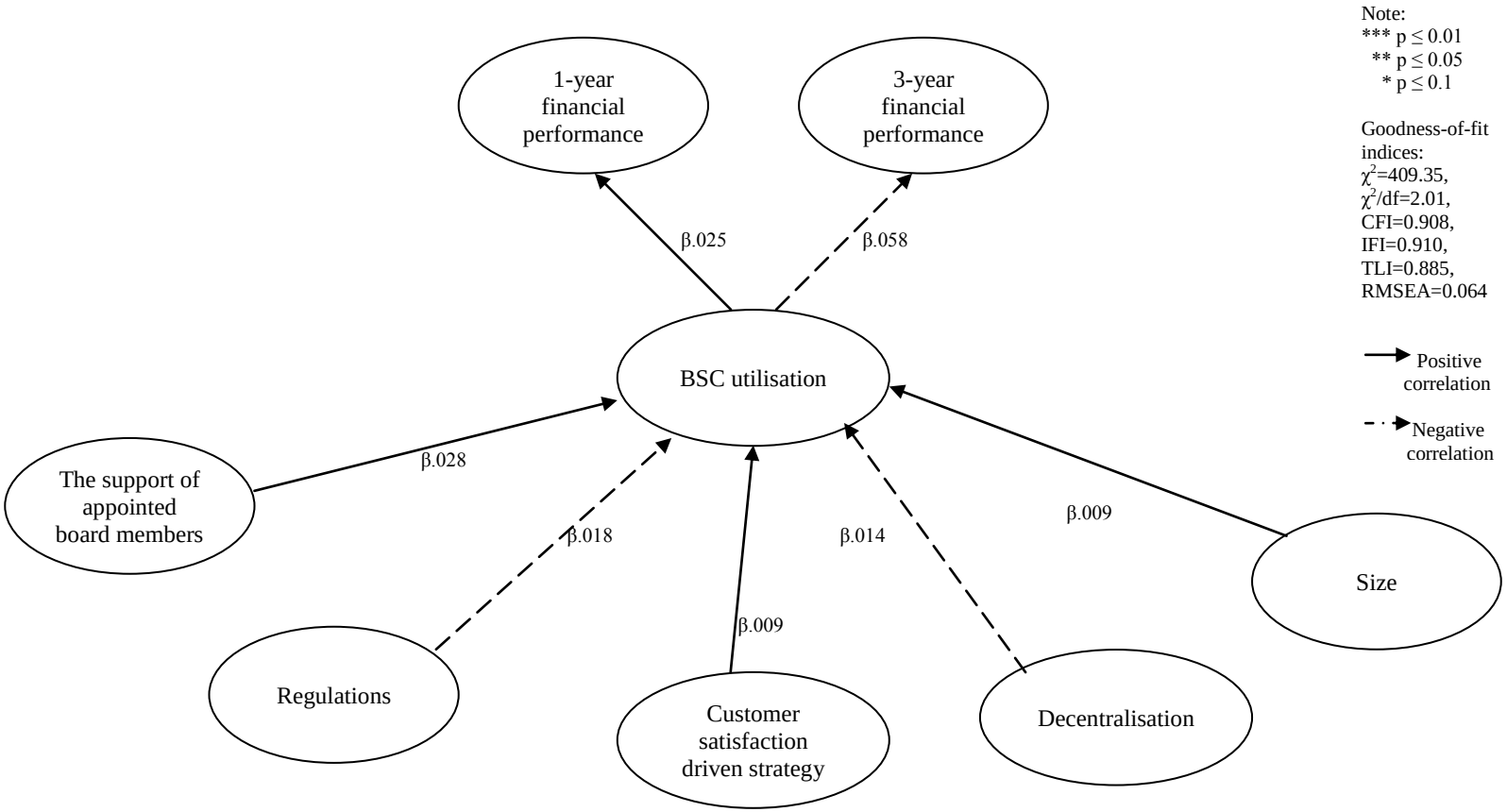


Figure 3 structure model parameter estimates (n=247).
(Standardised solution, only statistically significant paths are shown)

Analysis of mediation effect testing results through diagnosis BSC utilisation

The structured model was used with a series of nested modes beginning with the least constrained model, to test the mediating (indirect) effect of five contextual variables through three aspects of diagnostic BSC utilisation on financial performance. Similar to the process to the analysis of mediation effect testing results through interactive BSC utilisation, I computed the Chi-square value difference till the change performing insignificantly that indicates the model with the constrained path is a better fit. I continued this process until no further improvements could be made and the model was the most parsimonious explanation of the data. The results of the structural model are summarised in Figure 4. In this figure, the overall model was assessed using the goodness-of-fit indexes that suggest a good fit has been achieved within tolerable ranges (e.g. for GFI, IFI, CFI) and the path coefficients were calculated to test the relationships among five contextual variables, financial & nonfinancial performance measures and communication of diagnostic BSC utilisation, and 1- year & 3- year performance.

As shown in figure 4, the research model tests five contextual variables have a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance (hypothesis 2a-e).

Hypothesis 2a: the support of appointed board members has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

As expected in hypothesis 2a, the results in Figure 4 suggest that the indirect effect of the support of appointed board members on 1- year and 3- year financial performance path through communication is positive at the statistical level of significance. By contrast, no mediating effect appeared through the usage of financial and non-financial performance measurements. The strong and significant relationship between the appointed board members' support and regulation indicates that the implementation of regulations is positively supported by the board members. The results provide partial support for the hypothesis of 2a.

Hypothesis 2b: regulation has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

As the expectation of hypothesis 2b, regulation generates positive indirect effects on 1- year and 3- year financial performance through the usage of financial performance measurement and communication respectively at the significant statistical level as shown in Figure 4. Contradictory to the proposition, the indirect effect of regulation on performance through the use of non-financial performance measurement in Figure 4 is negatively correlated at the statistically significant level (for a one-tailed test). The results provide partial support for the hypothesis of 2b.

Hypothesis 2c: customer satisfaction driven strategy has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

The results shown, in Figure 4, indicates that 1- year and 3- year financial performance is positively and significantly related to a customer satisfaction driven strategy, mediated by, the use of financial performance measurement and communication as predicted in hypothesis three. Indirect effect of customer satisfaction driven strategy on performance was demonstrated to be positive and significant through the two aspects of: financial performance measurement and communication, for the performance management system. Inconsistent with the proposition, mediating effect of a customer satisfaction driven strategy on performance through the usage of non-financial performance measurement is negatively correlated, significant at the statistical level (for a one-tailed test). The results provide partial support for hypothesis 2c.

Hypothesis 2d: Decentralisation has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

As expected in hypothesis four, the mediating effect of decentralisation on 1- year and 3- year financial performance is positive and significant, as shown in Figure 4, path through the two aspects of the performance management system, the use of financial performance measurements and communication. Not as expected, the mediating effect of decentralisation on performance path through the usage of non-financial performance measurements is negatively correlated, significant at the statistical level (for a one-tailed test). The results provide partial support for hypothesis 2d.

Hypothesis 2e: size has a positive impact on the extent of the effect that the use of financial & non-financial performance measures and communication in firms has on 1- and 3- year financial performance.

The results in Figure 4 indicate that financial performance measurements used by large firms are positive and significant related to 1- year and 3- year financial performance as predicted in hypothesis five. Indirect effect of size on performance is currently demonstrated to be positive and significant, through the one aspect, financial performance measurement, of the performance management system. Inconsistent with the proposition, mediating effect of customer satisfaction driven strategy on performance path through the usage of non-financial performance measurement is negatively correlated, significant at the statistical level (for a one-tailed test). The results provide partial support for hypothesis 2e.

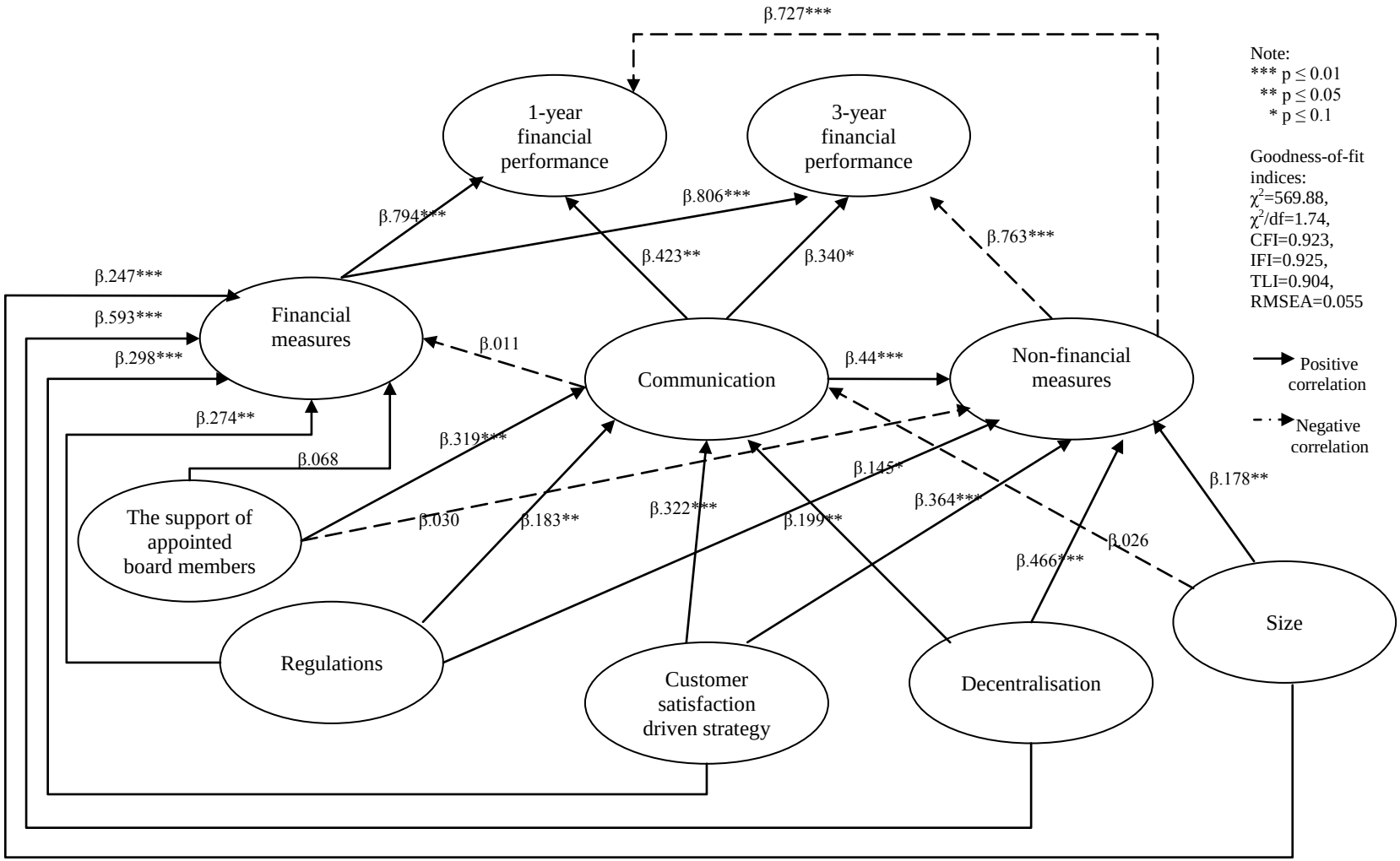


Figure 4 structure model parameter estimates (n=247).
(Standardised solution, only statistically significant paths are shown)

VI. Discussion, limitations, and conclusions

The descriptive analysis of the survey reveals that 9.3% Chinese firms use BSC as a performance management system. Compared with the BSC utilisation rate of 60% of the U.S. fortune 500, as revealed from an earlier investigation (Silk, 1998) and 30% Chinese listed companies reported by Chow et al (2007), the rate of 9.3% is far lower. The non-probability of sampling in these two surveys potentially increases the usage rate of BSC usage (Van der Stede, et al., 2005). For instance, the targeted sample in Chow et al (2007) was Chinese listed companies potentially causing some firms e.g. state-owned enterprise hardly selected into the survey sample.

Another figure in this survey revealed reported upon here, with respect to BSC utilisation, is, exception of 9.3% BSC user, 70.85% using BSC-oriented approach for performance management. Consistent with the adoption of extensive performance measurements around four dimensions of BSC, it has been cognitively believed to be beneficial to organisation performance as the usage of measurements diversity (e.g. Chenhall 2005; Itter and Larker 2003). For example, 32 performance indicators are required to measure financial and non-financial performance through the issued regulation by Chinese authority.

Accounting, such as the utilisation of BSC, has been examined to be effective interactively with organisational context, as has been previously suggestion by others (e.g. Anthony G. Hopwood, 1978). Contingency fit between MCS and organisational context (e.g. Otley 1980; Gerdin and Greve 2004) provides a theoretical foundation to explore the nature of the effectiveness of BSC utilisation in its context. The literature has identified the utilisation of BSC as a mediator mediating the relationship of performance and context. A mediation form of fit was used for testing the mediation effect of interactive and diagnostic BSC utilisation on performance dependent upon five variables the support of appointed board members, regulations, customer satisfaction driven strategy, decentralisation, and size. Five contextual variables conceptualised into the model tested to explore the contingent nature of BSC utilisation, has been taken into account in the present study. The SEM was used for examining the use of non-use of BSC, the three elements of BSC utilisation, financial & non-financial performance measures and communication, mediating performance and the five contextual variables hypothesised through ten hypotheses (H1a – e and H2a-e) in this study, as indicated by Gerdin and Greve (2008) that those path coefficients of the mediating effect of contingency variables cannot provide an alternative way for testing interactive relationships e.g. moderation. The results of this study provide several contributions to the literature.

Inconsistent with hypotheses one a-e (H1a-e), the mediation effects of BSC use on the relationships between the supports of appointed board members, regulations, customer satisfaction driven strategy, decentralisation, size and performance is close zero and insignificant. One possible explanation for no evidence in support of an effect of interactive BSC utilisation and organisational contextual variables is that organisation-orientation changes take place over a relatively longer time, for example, typically organisational strategy changes lag about ten years time after an organisation structure shifts from centralisation to decentralisation as was demonstrated in the Aston group (Pugh 1969). Another possible rationale causing lags is that BSC takes time to be adopted and designed in organisations and the consequence of the use of BSC is then reflected on organisational performance. The average duration years of BSC utilisation in this survey was 2.67 years

and the pilot of BSC adoption in five selected divisions at Tsingtao took around one and half years for the first stage to take place.

As expected, the use of communication of diagnostic BSC has a positive mediation effect on the relation between the support of appointed board members and 1- and 3- year financial performance. The use of financial performance measures and communication of diagnostic BSC has a positive mediation effect on the relation between regulations and 1- and 3- year financial performance. The contingency nature of the support of appointed board members and regulations that mediates the effects of the use of financial performance measures and communication of BSC on performance has echoed the argument that management accounting only can be properly understood when they are rooted into organisations and societies (Chapman, Cooper, & Miller, 2009; Hopwood 1978). The identification of contingency variables e.g. state intervention has reflected the argument that institutional context e.g. regulations plays its role in shaping organisational MCS (Whitley 1999).

Inconsistent with the expectation, the use of financial and non-financial performance measures' mediation effects on the relation between the support of appointed board members and 1- and 3- year financial performance is close zero and insignificant. Deloitte (2007) has demonstrated that the receptions from the board and managers on the performance measurements use are largely different for Tsingtao Company instance state-owned sharer focuses on performance measurements to evaluate managers' managerial performance for incentive purposes that are different from the use of performance measures used for organisational performance. The significant and positive; significant and negative association among regulations; the use of non-financial performance measures, and 1- and 3- year financial performance leads a further investigation in order to make a conclusion on these relations.

The finding of organisational characteristics of customer satisfaction driven strategy, decentralisation, and size impacting the effects of diagnostic BSC utilisation that has on performance contributes the literature through adding it to the contingency-based studies (Robert H. Chenhall, 2003; C. D. Ittner & Larcker, 2009; R. Kaplan, 2009) The use of financial performance measurement has been shown to be a path, through which, customer satisfaction driven strategy is not only significant and positive related to 1- year and 3- year financial performance. The mediating effect of customer satisfaction driven strategy on 1-year and 3- year financial performance, has also been demonstrated to be positively and significantly related indirectly through communication. While, the mediating effect of decentralisation on 1- year and 3- year financial performance, has also been found in a pathological condition of the usage of financial performance measurement, the functional communication of BSC has been indicated to be a path which by 1- year and 3- year financial performance is positively and significantly related to decentralisation. The larger organisations have been shown to be positive and significant related to 1- and 3- year financial performance indirectly, through the use of financial performance measurements.

While this present study has contributed to the literature on the effectiveness of BSC implementation, several limitations are acknowledged before conclusions drawn. First, a cross-sectional designed questionnaire survey at organisational level is used to collect the information on BSC utilisation in Chinese manufacturing industry. Although measurements e.g. performances that have been asked over 3-years time were used in the questionnaire, the lag influence on performance generated by the usage of performance measures might be

better avoided through the longitudinal design (e.g. Banker, Potter, & Srinivasan, 2000), which the cross-sectional information collection is hardly to test.

Second, the absence of technology in the models has a potential to be a following research project to be conducted. Technology has been considered as the longest established contingency variable in management accounting research. Indeed, the types of manufacturing technology used, for example: just in time, total quality management, flexible manufacturing can potentially influence the utilisation of BSC. Operational management systems that the form of flexible and innovative management control for manufacturing process is potentially coordinated with other management systems e.g. BSC integrated into information technology systems for one example of enterprises resource planning.

Third interest groups, state intervention only as one example in the current study, in Chinese economic environment might be investigated to be related with the effectiveness of PMS. As recognised by Gouldner (1954, pp. 27, 237) "Institutions have never been developed and operated without the intervention of interested groups […] which have different degrees of power". Institution theory gives us an approach to understand the interactions of these powers amongst interest groups and how organisations are formalised under their impacts. Future study can be developed to investigate the effectiveness of PMS related to the interested groups in both Chinese public and private sectors.

Fourth, complexity analytical model can be set up to simulate organisational environment for looking at multiple contingent variables and multiple control system factors simultaneously. Indeed, path analysis, especially structural equation model (SEM), may offer a technique to capture the more complex nature of the relationship among contingent variables and MCS (O'Connor, Deng, & Luo, 2005; O'Connor, et al., 2006; Smith & Langfield-Smith, 2004). Perhaps, the ultimate goal of contingent control research should be to develop a model such as simulation modelling (Law, Kelton, & McGraw-Hill, 1982) to test a comprehensive model that includes multiple control systems, multiple contingent variables, and multiple outcome variables.

This study has exhibited the contingency nature of BSC utilisation with a series of mediation effects on the relation between regulation, customer satisfaction driven strategy, decentralisation, and size and 1- and 3- year financial performance through the use of financial performance measure of BSC; on the relation between the support of appointed board members, regulation, customer satisfaction driven strategy, decentralisation and 1- and 3- year financial performance through the use of communication of BSC.

Table 1 Type of company

Type	Frequency	Percent	Cumulative Percent
State-Owned Company	126	51.02	51.02
Share Listed Company	50	20.24	71.26
Joint Venture Company	25	10.12	81.38
Share Cooperative Company	20	8.1	89.48
Private Company	15	6.07	95.55
Collective Company	7	2.83	98.38
Other	4	1.62	100
Total	247	100	

Table 2 factor analysis of performance measurements (n=247)

Financial performance measurement	Financial dimension (59.94%)		
	Income measurement (0.812)		
	Operating income	0.832	0.218
	Profits before tax	0.825	0.023
	Sales growth	0.817	0.164
	Cost measurement (0.732)		
	Capital cost rate	-0.063	0.802
	Bad debts	0.111	0.763
	Expense budget	0.442	0.646
	Cost reduction	0.423	0.607
Non-financial performance measuremen	Customer satisfaction dimension (69.21%)		
	Effective post-sales support measurement (0.895)		
	Number of customer complaints out of guarantee	0.908	0.206
	Warranty repair cost	0.883	0.194
	Number of customer complaints within guarantee	0.835	0.312
	Fast and reliable delivery measurement (0.756)		
	On-time delivery based on contact	0.195	0.796
	Survey of customer satisfaction	0.223	0.778
	Length of cycle time from order to delivery	0.354	0.690
	Market share	0.105	0.653
	Internal process dimension (54.41%)		
	Manufacturing procedure efficiency measurement (0.868)		
	Fixed asset productivity	0.836	0.229
	Revenue per man hour worked	0.815	0.055
	Rate of material scrape loss	0.778	0.156
	Capacity utilisation	0.777	0.074
	Product quality management measurement (0.669)		
	Percentage of defective products for sale shipped	0.108	0.724
	Enhance employee quality awareness	0.446	0.714
	Cycle time	0.213	0.685
	Percentage of perfect products out of all products	0.429	0.661
	Keep ISO9001 system utilisation	0.214	0.620
	Learning and growing dimension (59.01%)		
	Safety management measurement (0.876)		
	Improve managers' safety awareness	0.837	0.035
	Increase safety training time for employees	0.805	0.178
	Improve safety communications	0.746	0.235
	Safety committee	0.707	0.132
	Risk assessment	0.551	0.503
	Environmental compliance	0.551	0.496
	Upgrade some key equipment items	0.531	0.435
	Preventing risk measures	0.529	0.474
	Sustainability measurement (0.837)		
	Capacity utilisation of new product equipment	0.160	0.822
	Time-to-market new products	0.199	0.808
	Number of new products	0.006	0.793
	Employees' training time	0.448	0.575
	Employee morale and capacity	0.466	0.556

Table 3 factor analysis of communication variable (n=247)

Communication (0.690)	
Using internal newsletter	0.364
Team-building workshop	0.862
Further promote efforts to open communication barriers between divisions and business partners	0.857
Number of employee communication meetings	0.776
Number of customer communication meetings	0.776

Table 4 factor analysis of contextual variables (n=247)

Items	Factor1	Factor2	Factor3
State intervention (67.31%)			
The support of board (0.825)	0.579	0.364	
The board of directors	0.147	0.862	
Shareholders	0.172	0.857	
The supervisory board	0.278	0.776	
Regulation (0.783)			
Governmental regulations and policies	0.902	0.105	
Governmental edicts	0.869	0.169	
State-owned capital performance assessment regulations	0.628	0.184	
Customer satisfaction driven strategy (0.792)			
Customise products and services to customers' needs	0.839	-0.072	-0.025
Provide effective after-sale service and support	0.806	0.059	0.102
Brand image	0.608	0.165	0.202
Provide on-time deliveries	0.593	0.207	0.255
Provide high quality products	0.546	0.093	0.479
Market share	0.540	0.092	0.303
Decentralisation (0.849)			
Changing product selling prices	0.859	0.169	
Distribution of products/outputs decisions	0.809	0.281	
Operating procedures and schedule decisions	0.750	0.199	
Increasing the level of expenditure for advertising and promotion	0.622	0.407	
Increasing the level of expenditure for research and development	0.614	0.382	

Table 5 Descriptive statistics of research variables (n=247)

	Research variables	Range	Minimum	Maximum	Mean	Std. Deviation
Dependent research variables	1-year financial performance	12	3	15	6.55	1.9
	3-year financial performance	12	3	15	10.55	3.2
Explanatory research variables	BSC utilisation	1	0	1	.09	0.3
	the support of appointed board members	18	3	21	14.17	4.6
	regulations	24	4	28	18.66	6.1
	Customer satisfaction driven strategy	24	6	30	22.54	5.00
	Manufacture delegation	20	5	25	17.38	4.6
	Function delegation	16	4	20	13.27	3.7
	Size	9.70	2.08	11.78	7.09	1.87
	Cost indicator	12	3	15	10.48	2.5
	Income indicator	17	8	25	19.87	4.00
	Effective post-sales support indicator	13	3	16	9.47	3.6
	fast and reliable delivery	16	4	20	14.15	3.6
	Manufacturing procedure efficiency indicator	24	6	30	19.26	5.9
	product quality management	12	3	15	10.97	2.9
	Safety management indicator	40	10	50	34.86	8.3
	Sustainability indicator	12	3	15	9.42	3.2
	Communication	30	5	35	23.08	6.5

Table 6 Correlations of research variables

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. 1-year financial performance	.435(**)	.015	.165(*)	.169(**)	.182(**)	.071	-.018	.266(**)	.212(**)	.122	.173(**)	.073	.062	.140(*)	.146(*)	.168(**)
2. 3-year financial performance	1	-.023	.103	.101	.119	.086	.079	.080	.308(**)	.050	.171(**)	.002	.033	.121	.119	.113
3. BSC utilisation		1	.028	.089	-.037	.040	.070	-.049	-.130(*)	.041	.007	.060	.054	.004	.089	.105
4. regulations			1	.461(**)	.222(**)	.138(*)	-.062	.184(**)	.167(**)	.217(**)	.282(**)	.209(**)	.215(**)	.290(**)	.070	.407(**)
5. the support of appointed board members				1	.176(**)	.079	-.040	.213(**)	.162(*)	.149(*)	.198(**)	.104	-.001	.170(**)	.077	.405(**)
6. Customer satisfaction driven strategy					1	.410(**)	.091	.276(**)	.465(**)	.298(**)	.441(**)	.324(**)	.357(**)	.336(**)	.342(**)	.331(**)
7. decentralisation						1	.091	.282(**)	.319(**)	.307(**)	.396(**)	.395(**)	.405(**)	.398(**)	.448(**)	.355(**)
8. size							1	.048	.180(*)	.009	.101	.132	.222(**)	.129	.107	-.024
9. Cost indicator								1	.443(**)	.398(**)	.441(**)	.413(**)	.288(**)	.378(**)	.312(**)	.240(**)
10. Income indicator									1	.175(**)	.395(**)	.178(**)	.255(**)	.241(**)	.208(**)	.239(**)
11.Effective post-sales support indicator										1	.538(**)	.557(**)	.409(**)	.393(**)	.488(**)	.355(**)
12. fast and reliable delivery											1	.621(**)	.476(**)	.496(**)	.476(**)	.455(**)
13. Manufacturing procedure efficiency indicator												1	.644(**)	.630(**)	.653(**)	.423(**)
14. product quality management													1	.606(**)	.575(**)	.320(**)
15. Safety management indicator														1	.564(**)	.430(**)
16. Sustainability indicator															1	.396(**)
17. Communication																1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 7 Performance management system

	Performance management system	Frequency	Cumulative Frequency	Frequency Percent	Cumulative Frequency Percent	Average year of using PMS
c	Comprises a number of performance measures with the balance divided more or less equally among the key areas of the business being monitored (e.g. financial performance, customer satisfaction, internal growth…)	88	88	35.6	35.6	3.20 (1.282)
d	BSC	23	111	9.3	44.9	2.67 (1.197)
b	Comprises a number of performance measures with the balance of measures being designed to measure performance	34	145	13.8	58.7	3.10 (1.165)
e	state-owned capital performance system	53	198	21.5	80.2	3.41 (1.299)
a	Comprises a number of separate and unrelated performance measures	34	232	13.8	94	3.53 (1.459)
f	EVA	4	236	1.6	95.6	3.33 (1.155)
	other	11	247	4.4	100.0	
	Total	247		100.0		

Table 8 Principal component and weight of each BSC dimension (n=23)

Kaplan & Norton's dimensions	Component	Sum of responses[1]	Weight of component	Weight of dimension[2]	Kaplan & Norton's weight of dimension	Weight Difference[3]
Financial	Cost measurement	222	8.03	22.53	22	0.53
	Income measurement	401	14.5			
Customer	Effective post-sales support measurement	209	7.56	18.88	22	-3.12
	fast and reliable delivery measurement	313	11.32			
Internal business process	Manufacturing procedure efficiency measurement	429	15.51	24.22	34	-9.78
	product quality management measurement	241	8.71			
Learning & growing	Safety management measurement	734	26.52	34.37	22	12.37
	Sustainability measurement	217	7.85			
Total		2766	100	100	100	0

Note: 1) The sum of responses is the results of every indicator from respondents added up.
2) The weight of dimension is the sum of weight of each component of each BSC dimension.
3) 'Weight difference' is weight of dimension given this Table minus Kaplan and Norton's weight of dimension.

Table 9 Levene Samples Test (n=247)

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	Sig. (2-tailed)
Cost measurement	0.731	0.393	-1.829	0.069
Income measurement	1.955	0.163	-1.064	0.289
Effective post-sales support measurement	3.554	0.061	0.818	0.414
fast and reliable delivery measurement	2.888	0.091	0.623	0.534
Manufacturing procedure efficiency measurement	1.342	0.248	0.502	0.616
product quality management measurement	4.559	0.034	0.841	0.401
Safety management measurement	0.024	0.876	-0.026	0.979
Sustainability measurement	3.009	0.084	1.379	0.169

** $p \geq 0.05$, * $p \geq 0.1$ (two-tailed test)

Table 10 Measurement model of financial performance measurement (n=247)

Items	Factor loadings	Composite reliability	Average variance extracted
A. Income measurement		0.598	0.816
Item 16-1	0.860		
Item 16-2	0.674		
Item 16-3	0.775		
B. Cost measurement		0.546	0.707
Item 16-5	0.733		
Item 16-6	0.832		
Item 16-7	0.405		
Goodness-of-fit indices: χ^2=4.364, χ^2/df=0.54, CFI=0.999, IFI=0.980, TLI=0.998, RMSEA=0.053			

Table 11 Measurement model of non-financial performance measurement (n=247)

Items	Factor loadings	Composite reliability	Average variance extracted
A. Effective post-sales support measurement		0.742	0.896
Item 16-14	0.826		
Item 16-15	0.912		
Item 16-16	0.844		
B. Fast and reliable delivery measurement		0.601	0.775
Item 16-11	0.697		
Item 16-12	0.796		
Item 16-13	0.699		
C. Manufacturing procedure efficiency measurement		0.627	0.870
Item 16-19	0.760		
Item 16-20	0.777		
Item 16-21	0.867		
Item 16-22	0.757		
D. Safety management measurement		0.540	0.823
Item 16-33	0.716		
Item 16-34	0.815		
Item 16-35	0.787		
Item 16-36	0.603		
E. Sustainability measurement		0.626	0.894
Item 16-28	0.708		
Item 16-29	0.840		
Item 16-30	0.818		

Goodness-of-fit indices: χ^2=193.60, χ^2/df=1.70, CFI=0.964, IFI=0.965, TLI=0.952, RMSEA=0.053

Table 12 Correlation coefficients of constructs (n=247)

	1	2	3	4	5	6	7	8	9	10
1. 1- year financial performance	1									
2. 3 - year financial performance	.435(**)	1								
3. Financial performance measurement	.256(**)	.298(**)	1							
4. Non-financial performance measurement	.127	.070	.351(**)	1						
5. Communication	.164(*)	.102	.236(**)	.449(**)	1					
6. Regulation	.165(*)	.103	.223(**)	.246(**)	.375(**)	1				
7. The support of appointed board members	.169(**)	.101	.193(**)	.130(*)	.368(**)	.461(**)	1			
8. Customer satisfaction driven strategy	.182(**)	.119	.474(**)	.393(**)	.304(**)	.222(**)	.176(**)	1		
9. Decentralisation	.071	.086	.349(**)	.465(**)	.348(**)	.138(*)	.079	.410(**)	1	
10. Size	.007	.069	.211(**)	.126	-.025	-.031	-.010	.138(*)	.112	1

** $p \leq 0.05$, * $p \leq 0.1$ (two-tailed test)

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