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The adoption of "Western" management accounting/controls in China's state-owned enterprises during economic transition

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Abstract

This study explores the influences on the adoption of "Western" management accounting/control practices by China's state-owned enterprises (SOEs). This topic is important given the potential for such practices to affect SOE operations in the midst of China's continued privatization programme, and the continued opening of its markets to competition. In-depth interviews were conducted with managers at four SOEs and two of their joint ventures. These interviews indicated increased use of a range of Western management accounting/controls in the SOEs. They also shed light on the factors that influenced the level of adoption. These findings were used to refine a survey instrument for data collection from 82 other SOEs. The survey indicated significant and predicted influences from use of limited-term employment contracts, joint venture experience, stock exchange listing, and the availability of training.

Introduction and overview

This study explores the influences on Chinese state-owned enterprises' (SOEs') adoption of "Western" management accounting/control practices. This topic is important because the modernization and restructuring of SOEs is a central part of China's current economic reforms (Lee, 2001). Reports to China's People's Congress by two consecutive premiers, Li Peng and Zhu Rongji, both pointed to the restructuring of SOEs as being the most important task for their economic policies (Lee, 2001). Lee (2001, p. 673) notes that 'the restructuring of SOEs includes changing the firm from (being a) quasi-government agency to a profit-oriented corporation, converting the financial statements from the cash-based Soviet style fund accounting to the accrual-based Western style financial accounting, and identifying a vehicle for building a new ownership structure and corporate governance.' Understanding the factors that influence SOEs' adoption of Western management accounting/controls can enhance the success with which such practices are disseminated, in turn influencing the SOEs' economic performance, thus the speed of China's economic development and the livelihood of millions of its citizens. This expectation is premised on Western"

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management accounting/controls being useful for increasing efficiency and effectiveness, reducing manager error, enhancing learning (Bruns & Stalker, 1961; Lawrence & Lorsch, 1967; Shields & Shields, 1998), as well as for helping to contain corruption (Perrow, 1986).

Firth (1996) has used a survey to explore the 'changes in management accounting practices and the diffusion of accounting ideas from foreign companies to enterprises in the P.R.C. (People's Republic of China)' (Firth, 1996, p. 638). Labeling such adoption "diffusion", Firth found that SOEs that had joint ventures (JVs) with foreign partners tended to have higher diffusion indices than did their non-JV SOE counterparts. Nationality of the foreign JV partner (USA and Europe versus others), the degree of competition experienced by the Chinese partner (proxied by the percent of a JV's sales for export), and enterprise size were positively and significantly related to the extent of diffusion.

While Firth's study has contributed useful insights into the topic, its findings are based on data from 1990 to 1993, a relatively early period in China's recent economic reform movement. As will be detailed in the next section, a number of dramatic changes have occurred subsequent to that time. For example, stock exchange listing became a central platform for a more recent round of Chinese enterprise reforms (Sinha, 1995). Also, 'the notion of contracts for jobs based on Western-style personnel practices (became) ... sanctioned in the ... Law (Labour Law, July 1994).' (Warner, 1996, p. 216), such that by 1997, individual contracts were an across-the-board phenomenon in large SOEs (Goodall & Warner, 1999, p. 28). By examining a more recent period—1996–1999—our study is able to consider a much broader set of factors operating in the current Chinese economic environment.

Another limitation of Firth's (1996) study is that it only considered accounting controls. Specifically, Firth (1996) examined the use of standard costs and budget responsibility centres. While such controls are important, they only constitute a small part of enterprises' management systems. Further, both tend to be focused at the lower management levels. In comparison, the decisions and actions of managers at higher levels can have far greater impact on the enterprise. Managers at these levels also tend to be subject to multiple controls, only some of which are accounting-based. Our study focuses on the functional manager level and we consider both accounting and non-accounting practices, including organizational structure (Chenhall & Morris, 1986; Bruns & Waterhouse, 1975; Gordon & Narayanan, 1984), behavioural and output controls (Merchant, 1985), profit centre and discretionary controls (Chow et al., 1996), and costing and budget controls (Firth, 1996).

The remainder of this paper is structured as follows. Section 2 briefly reviews the theories underpinning this study. Then major aspects of China's recent economic reforms are discussed within this theoretical context to yield nine hypotheses. Section 3 discusses insights from field-based interviews on SOEs' recent management accounting/control changes. Section 4 explains the design of a survey based on the interview findings, and the results of hypothesis tests using the responses. Section 5 provides a summary, conclusions and suggestions for future research.

Theory and hypotheses

Theoretical framework

China's recent economic reform—in particular, privatisation and the opening of markets—has fundamentally changed the economic and regulatory environments in which SOEs operate (Child, 1994). Adding to the challenges in adjusting to these changes is the co-existence of market forces and state influences. In particular, opaque, uncertain, and unpredictable regulatory frameworks often are formed by both central and local governments. These not only complicate the organization of production and marketing, but often also nullify the strategic planning of SOEs (Lin et al., 1998). Foreign competition, national market segmentation, and industrial policy differences across industries and regions further add to the complexity and information processing demands, in turn increasing the need for mechanisms capable of dealing with complexity (Tushman & Nadler, 1978).

The increased environmental complexity, together with increased delegation of decision making authority to SOEs, also has important implications for the principal-agent relationships within SOE management. When a centrally planned system is demolished, both task and institutional environments become more uncertain, unpredictable, and unverifiable (Naughton, 1995; Nee, 1992; Perkins, 1994). In turn, the increased ambiguity that surrounds cause–effect relationships amplifies the information asymmetry between higher and lower levels of management, and likely the latter's room for discretion. Both factors are commonly viewed as prime sources of principal-agent discord (Eisenhardt, 1989; Gerhart & Milkovich, 1990; Williamson, 1975). For example, as higher level SOE managers face increasing needs to rely on information obtained from subordinates (e.g. what costs are, whether workers can be reassigned, or what improvements in production techniques can feasibly be introduced), the latter may hide or even bias the information so as to influence superiors' decisions (Groves et al., 1994).

In the process of responding to such information processing and agency issues, institutional theory suggests that SOEs will adapt their management practices, which include governance structures and management accounting/controls, to gain legitimacy and to ensure their survival (DiMaggio & Powell, 1983, 1991; Zucker, 1987). Organizations may adopt practices voluntarily in response to pressures to conform with accepted standards of practice, or involuntarily in response to coercion by powerful institutional forces that control critical resources (DiMaggio & Powell, 1983, 1991; Scott, 1987).

Agency theory also suggests that SOEs would increase their use of management accounting/controls to monitor the performance of employees, because increased information asymmetries make their behaviour costly or difficult to observe (Eisenhardt, 1989; Gerhart & Milkovich, 1990). "Western" management accounting/controls can orient functional managers toward different aspects of their organizations and environments, affect risk preferences, and enhance organizational performance (Fisher & Govindarajan, 1992; Zajac & Westphal, 1994). Li (1997) demonstrates that these responses improve both marginal and total factor productivity. Such responses are also endorsed by the World Bank (Megginson & Netter, 2001).

The nature of, and factors in, Chinese enterprises' adoption of "Western" management accounting/controls

In the subsections that follow, major aspects of China's recent economic and regulatory reforms will be reviewed as the basis for proposing nine hypotheses about SOEs' adoption of "Western" management accounting/controls (see Fig. 1). The changes are discussed in chronological order, with particular attention to 1996–1999—the period covered by the current study.

Employment contracting reforms

Employment contracts with specified terms were introduced in 1986, with the aim of dismantling China's "iron rice-bowl" employment policy (Hassard et al., 1999; Korzec, 1992; Kaple, 1994). As part of this reform, material incentives were slowly introduced, and bonuses became more important as a method of rewarding effort and productivity (Takahara, 1992). However, by 1990, only one in 10 workers was employed on a contract basis rather than having a job for life (Korzec, 1992). In 1992, the contracting reforms gained greater credibility when the Chinese government decided to steer larger SOEs into the market, and to hold them responsible for their profits and losses. In July of that year, the State Council issued the "Provision for the Transformation of the Management Mechanism of State Owned Industrial Enterprises." This directive affected nearly 11,000 large and medium-sized SOEs, which together contributed approximately 60 percent of China's total industrial taxes and profits. These SOEs were granted autonomy regarding such aspects of management as the purchase of raw materials, production targets, product mix and pricing (Liu & Eddie, 1995). A new social security system (incorporating unemployment insurance) was established to cushion the blow to those workers

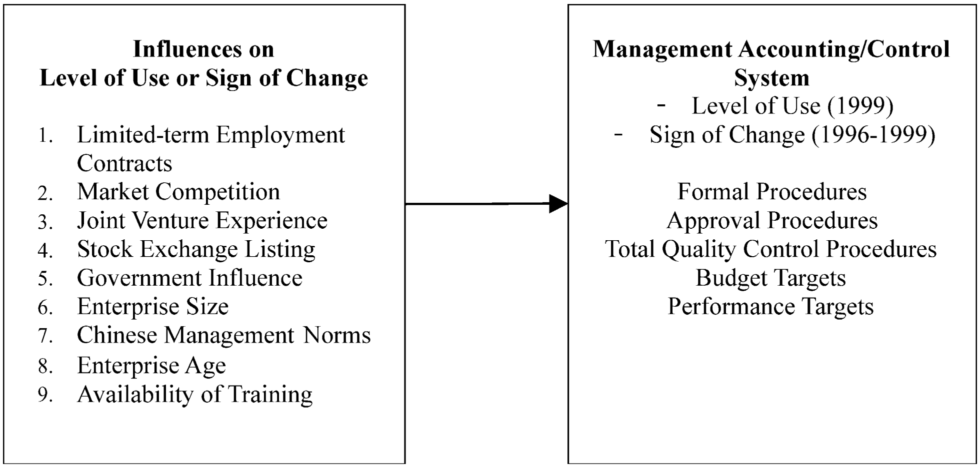

Fig.1. Theoretical framework for the study.

displaced, and lifetime tenure for communist party members ("cadres") was abolished to encourage freer transfer of personnel. By 1997, at least 50% of employees were on contract terms (Goodall & Warner, 1999, p. 28; Hussain & Zhuang, 1997, p. 33).

Based on agency theory, the use of contract terms, coupled with increased autonomy, creates a demand for mechanisms to control and monitor manager performance (Brickley et al., 2000). One source of this demand is the enterprise owners, who would gain from safeguarding assets and improving factor productivity. Demand also could come from the enterprise managers. With the introduction of contract terms, managers who are more capable and/or less prone to corruption, would have incentives to distinguish themselves from others via the voluntary adoption of transparent and objective controls. Thus, Hassard et al. (1999, p. 73) report that in the 1990s, systems of audit and appraisal, both internal and external, were increasingly implemented to check that assets were not being run down or disposed of improperly. More broadly, we hypothesize:

H1. SOEs' use of Western management accounting/controls increases with their use of limited-term employment contracts.

Market competition and joint venture experience

Concurrent with reforming SOE management, the Chinese central government moved to expand the private (non-SOE) economy within China.[1] At the end of 1992, the private sector made up 36.8% of the economy, comprised of 15.3 million individual and commercial units with 24.6 million employees and a gross output valued at 113 billion Yuan (Hussain & Zhuang, 1997, p. 21). Subsequently, much broader ranges of industries and sectors of the economy were opened to the private sector, and involvement in export-oriented ventures was encouraged (Liu & Eddie, 1995, p.148). Also, the "Enterprise Income Tax Law" was promulgated in 1994. Prior to enactment of this law, each SOE's target profit and remittance to the government were negotiated individually. By imposing a standard corporate income tax rate of 33% on all large and medium-sized SOEs, the law leveled the playing field both across SOEs, as well as between them and the private enterprises (Xiang, 1998, pp. 110–111). By 1996, the private sector had grown to become 63% of the economy, and by 1999 this figure would further increase to 72% (*China Statistical Yearbook*, 2000, p. 407). Undoubtedly, this development added significantly to the competition faced by the SOEs. Further augmenting change in this direction, sharp reductions of import and export customs duties involving more than 4800 groups of commodities were announced in 1997, effectively

[1] The private economy includes collective and individual-owned enterprises where the state does not hold a controlling share.

reducing the customs duties level by 26% (Zhu, 1997).

As Groves et al. (1994, p. 185) note, the result of increased competition from other state firms and new, non-state firms is a demand for "extra discipline." The monopoly positions granted to SOEs under central planning quickly disappear when foreign investors bring in their technological and organizational expertise and offer more innovative products and superior customer responsiveness. This change provides both an impetus and opportunity for mimetic isomorphism, whereby SOEs perceive legitimate foreign enterprises as models to imitate (Guthrie, 1999). For example, Li (1997, p. 1101) notes that market competition 'generated considerable pressure to improve both cost and quality,' which in turn increased the need for more formal management controls. Firth (1996, p. 640) notes, 'The change toward a free enterprise market system in the P.R.C. represents a major economic shock to many Sino companies and leads to what might be viewed as a serious performance gap where the accounting systems developed under the socialist philosophy are perceived as wholly inadequate for a capitalist structure.' Firth (1996) found a positive relation between diffusion of management accounting procedures and the percentage of the Chinese JV partner's sales from exports. This finding is consistent with higher market competition focusing the Chinese enterprises' management on efficiency, profitability, and meeting customers' needs, in turn promoting greater use of management accounting/controls to account for and to manage these factors. Thus, following Firth, we hypothesize:

H2. SOEs that face higher market competition make greater use of Western management accounting/controls.

Another notable development in this period is the increased legitimization of foreign investment in China. The main vehicle for this move was government encouragement of SOEs' joint venturing (JV) with foreign multinational corporations. During the 1990s growth in foreign investment by way of joint ventures increased substantially. In 1992, foreign funded enterprises contributed 7% of the gross industrial output. This figure had grown to 12% by 1996, and it was nearly 16% in 1999 (*China Statistical Yearbook*, 2000). As Firth (1996) reported, the adoption of new management accounting techniques was more widespread among those SOEs that had joint ventures with foreign enterprises. By engaging in a JV, a SOE has increased opportunity to model itself on the foreign partner. In addition, the foreign partner often assisted the change process through on-the-job learning and formal in-house training, support of outside training in local schools, and trips overseas (Child & Markoczy, 1993; Firth, 1996; Yan & Gray, 1994). Involvement in a JV also may introduce elements of coercive isomorphism, with the foreign JV partner imposing perceived best practices on a joint venturing SOE as part of an export value chain. Both forces would push towards greater use of Western management accounting/controls. Hence, we hypothesize:

H3. SOEs with joint venture experience make greater use of Western management accounting/controls.

Stock exchange listing

In September 1997, the Chinese Communist Party's (CCP's) Fifteenth Congress endorsed several aggressive state-enterprise reform initiatives. These reforms were 'intended to bring into Chinese SOEs modern management mechanisms and what are seen in China as important elements of the "Western," or capitalist, company structure, such as overall company direction by a board of directors that answers to shareholders.' (Hassard et al., 1999, p. 70). The CCP also affirmed the importance of the stock market and open market competition. One key initiative was moving from an experiment to official endorsement of the transformation of small-scale SOEs into shareholding cooperatives (Smyth, 1998, p. 122). Another initiative was dividing up SOEs into subcompanies for eventual formation into either (a) shareholding companies destined for stock-market listing and whose shares can be bought by anyone, including individuals, or (b) limited-liability companies, whose shares can only be bought by institutional investors, such as state-owned banks or insurance companies, other SOEs, or state trade unions (Hassard et al., 1999, p. 71). To put this initiative into perspective, China's stock markets were established in 1990 (Shanghai) and 1991 (Shenzhen) with 13 firms listed in 1991. By 1996, the number of listed firms had grown to 604, with market capitalization of 938.4 billion Yuan. By 1998, there were 851 firms listed with a market capitalization of 1950 billion Yuan (*China Securities Regulatory Commission*, 2001).

Raising capital through stock offerings can be expected to create demands for accountability. An additional source of pressure was the central government's increased acceptance of poorly managed listed SOEs being acquired by private companies (Cheng, 2001). Both factors would create pressures on listed SOEs to adopt management systems that enhance organizational transparency, efficiency, and productivity (Cheng, 2001; Megginson & Netter, 2001; Pannier, 1996). For example, Sinha (1995, p. 19) notes that:

> Raising capital through stock markets became necessary to finance large projects. The functioning of such markets requires information about the underlying structures of prospective investments. This process in turn requires better accounting and transparent record keeping by the companies. Hence there was further pressure on adopting better accounting methods.

Thus we hypothesize:

H4. Listing on stock exchanges increases SOEs' use of Western management accounting/controls.

Government influence and enterprise size

Beyond privatisation and the opening of markets, China's recent reforms also were aimed at 'reducing government interference in enterprise management.' (Hassard et al., 1999, p. 70). Shleifer and Vishny (1994, p. 1015) have argued that the effective restructuring or modernization of public enterprises largely depends on the extent to which employment control rights are transferred to management in the process of corporatization. In China's SOEs, government influence still exists via the power of communist party officials to intervene in enterprise decision-making, including the appointing of SOE managers, cadres and boards of directors (Hassard et al., 1999, pp. 75–76). But such influence is not uniform, as firms in different industries and regions are subject to idiosyncratic treatment by governmental policies (Lin et al., 1998).[2] For example, SOEs in more decentralized industries and coastal cities tend to have greater freedom in human resource administration. And even within the same industry or region, not all SOEs have state representatives as board members or asset-management supervisors.

In addition to constraining SOEs' latitude for change, government influence also can shift SOE management's attention away from efficiency or profitability. For example, the government may emphasize providing employment over efficiency out of a concern for social stability. Both the hindrance and goal displacement from government influence can reduce SOE managers' intention to sharpen managerial discretion, improve organizational efficiency, and adopt advanced enterprise management systems (Branie, 1996; Peng & Heath, 1996; Child, 1994; Groves et al., 1994). For example, Goodall and Warner (1999) found that government influence impeded the implementation of modern human resource management practices. Based on the preceding discussion, we hypothesize:

H5. SOEs' use of Western management accounting/controls decreases with their extent of being subject to government influence.

Another characteristic of government influence is that different treatments are accorded large vs. small SOEs (Lee, 2001; Goodall & Warner, 1999; Zhu,

[2] It is possible that the different treatments are the result of the government rationally determining the level of influence needed based on the level of liberalization forces faced by SOEs across and within particular industries. Some (e.g. Chen, 2000) have argued that in industries with less growth and employment opportunities, the government exercises greater influence over human resources, thereby constraining the adoption of more efficient forms of enterprise.

1999). Large SOEs help to bear a heavier share of the burden from retirement pensions, other social-welfare costs, and redundant workers (Lin et al., 1998, p. 425; Goodall & Warner, 1999, pp. 33–34) and thus have garnered preferential support during various reform stages. For example, as part of expecting large SOEs to alleviate the unemployment problem, 'in 1996, the government supported a total of 300 large SOEs and fifty-seven conglomerate groups. By the end of 1998, it will have increased its support to 512 large SOEs and 120 conglomerates.' (Chen, 1998, p. 29). In contrast, for small SOEs, the government has adopted a "let go" strategy. The head of a World Bank Mission in China commented as follows on the SOE reforms launched at the 15th Party Congress in 1997: '(M)any of the smaller enterprises are ending up as non-state operations or cooperatives or are being taken over by the managers or workers in some form which is close to privatisation…Basically the government is saying "We are going to let them go and it is the only practical thing." ' (Seidlitz, 1998, p. 8). Since government support is likely to reduce both the urgency and leeway for adopting more formal and transparent management accounting/controls, we hypothesize:

H6. SOEs' use of Western management accounting/controls decreases with their size.[3]

Chinese management norms and enterprise age

Yet another factor that can impede the adoption of more formal (and presumably impartial) and transparent processes and controls is Chinese management norms. Such norms generally reflects a preference for well-established routines and procedures (including an iron-rice bowl mentality (security of employment)), formal centralized bureaucracy, respect for status and seniority, and a strong sense of egalitarianism (Baird et al., 1990; Von Glinow & Teagarden, 1988; Davidson, 1987). Attributes like these are antithetical to Western management accounting/controls that: a) facilitate information processing through the decentralization of decision making, and b) deal with agency costs through the use of more formal performance evaluation routines. Chinese management norms—specifically in respect to the prevalence of coalitions between workers and supervisors, and between managers and government representatives—had been found to be a formidable barrier in the adoption of past reforms (Cauley & Sandler, 1992; Lee, 1990). Since practices require time to arise and to become entrenched, they are likely to be an obstacle to change in older SOEs. Hence, we hypothesize:

H7. SOEs' use of Western management accounting/controls decreases with the presence of Chinese management norms.

H8. SOEs' use of Western management accounting/controls decreases with their age.

Availability of training

At the organization level, an important influence on management accounting/control practices is the availability of training and organizational participants' capability to work within a more formal and transparent environment. Training facilitates the development of absorptive capacity—the capability to acquire, assimilate, and exploit information regarding appropriate innovation (Cohen & Levinthal, 1990). Since increased use of Western management accounting/controls implies greater responsibility and accountability on the part of managers, it would require SOE managers to have this absorptive capability. For managers of Chinese SOEs, training can come from multiple sources, including on-the-job learning, formal in-house training, and outside training in local schools (Child & Markoczy, 1993; Yan & Gray, 1994). It also can be conducted by organizational members (e.g. senior managers) or external parties (e.g. joint venture expatriates or consultants). We hypothesize:

[3] In contrast to H6, H5 predicts that government influence will also vary across SOEs of similar size due to other government purposes (e.g. industry and location). Thus it is possible for H5 to be independent of H6.

H9. SOEs' use of Western management accounting/controls increases with the availability of training.

Method

A two-stage data collection approach was used to increase our ability to capture the phenomenon. The first stage consisted of in-depth interviews at four SOEs and two of their joint venture partners. These interviews served two purposes. First, they provided insights into the SOEs' management accounting/control practices in their own right. For this purpose, the advantage of the interview approach was that it permitted following up on "how" and "why" questions (Yin, 1989) to 'map novel, dynamic, and/or complex phenomena ignored or inadequately explained by existing theories.' (Keating, 1995, p. 69). The second purpose was to inform the development of a survey instrument, which was used to collect data from a larger sample of SOEs for hypothesis testing. The design and findings of the interview study are discussed in the remainder of this section.

Interview study

We limited our sample to manufacturing enterprises due to their importance in the current Chinese economy, and to control for extraneous variation (Eisenhardt, 1989) across industry sectors. Firms were selected from two industries likely to differ on factors that could affect the motivation to adopt more formal and transparent management accounting/control systems (e.g. market competition and technological dependence on foreign investment). Also, the chosen entities had to have existed for at least several years so that a history of operating data would be available.

Visits were made in December 1997 to six enterprises in Shanghai. Two each of these were SOEs from the food and electronics industries. One SOE from each industry was a JV partner (JV-SOE) and one was a non-joint venturing SOE (non-JV SOE). This mix was aimed at permitting the effects of joint venturing to be manifest, as engaging in joint ventures had been identified by Firth (1996) as a major diffusion driver. The two remaining enterprises were JVs with which the JV-SOEs were involved. They provided a base of comparison for information gathered from their SOE-JV partners. The selected enterprises and interviewees were contacted through the university network in Shanghai.

The visit to each enterprise involved in-depth, one-on-one interviews with one senior and one functional manager, making 12 interviews in total. All interviews were conducted in Chinese with two of the co-authors present, and took between two to three hours per enterprise.[4] Interviewees were sought from two management levels because the controls applicable or applied to each may differ. Obtaining responses from more than one source also facilitated triangulation of data.

A pre-determined interview protocol was followed which included a combination of closed-ended and open-ended questions. The interviews were conducted in the same order.[5] The Appendix presents the open-ended question protocol used for the senior manager interviews. A similar protocol was used for interviewing the functional managers. To ensure data accuracy, we conducted numerous checks (Lincoln & Guba, 1985) by which the original interviewees verified our transcribed scripts and our interpretations of their responses.

Interview questionnaire

The structured part of the interview questionnaire contained questions about the manage-

[4] Interest shown by the interviewees to our study and method was evident on a number of accounts. Most managers commented on the high relevance of questions across all areas. They also reported that the nature of the interview data gathering exercise was their first experience. Their previous involvement had been limited to completing surveys for studies conducted at a distance. Consequently, most managers were quite forthcoming with examples in follow-up to many of our questions.

[5] We have to acknowledge the possibility that the interviewees may have been sensitized to our research expectations (as reflected in the structured questions in sections one and two), and that this may have created demand effects on their responses with respect to the influences on changes during the 3-year period. Mitigating this concern is our having asked about the level of environmental and government influence in the second section before asking about changes in the third and fourth sections.

ment accounting/controls in use at two different points in time, as well as the forces, facilitators and barriers associated with the change in these uses.[6] The questionnaire (and sequence of the interview) was divided into four sections: organizational characteristics, environmental and government influences on the organization, management accounting/control practices, and other influences on change (forces, barriers and facilitators). Each section contained items that asked for responses on a 7-point Likert scale, followed by open-ended questions. For each item, responses were sought relating to the time of the interview (December 1997) and three years previous (1995). Our expectation was that by considering the extent and sign of change across time, the interviews would better elucidate the dynamics of the change process, in turn enriching design of the survey instrument. Choice of the 3-year time span was based on extant findings that such a time window is needed to capture changes in organizational systems and practices (Chenhall, 1997; Simons, 1987). There were 144 scaled-response items in all.[7]

The first section on *Organizational Characteristics* comprised six questions on the organization, together with size (number of employees) (Firth, 1996), sales growth rate (Libby & Waterhouse, 1997), percentage of output exported (Firth, 1996), prior JV experience (Firth, 1996) and organizational performance (Beamish, 1987). The second section comprised environmental and government influences on the organization. The questions on *Environmental Influences* (14 items) were adapted from Gordon and Narayanan (1984) and Chenhall and Morris (1986), with several items added to reflect the China environment. In addition to the two points in time, the 14 items were asked with respect to two sets of scales. The first scale was the predictability of the environment (1 = Highly unpredictable, and 7 = Highly predictable), and the second scale was the extent of the environment's impact on the survival or success of the firm (1 = Very low impact, and 7 = Very high impact). The scale for *Government Influence* (5 items) was developed from the literature (e.g. Hassard et al., 1999), in conjunction with the authors' prior experience in case study visits to both SOEs and joint ventures in China. The items focused on the internal vs. external composition of the board of directors, percentage shareholdings by different parties and the role of the government representative. Answers were sought with respect to how different aspects of governance structure (including% stock ownership by outside directors, and the role of the government representative) affected the decisions that the interviewee had made for the part of the enterprise that they manage, using a seven-point Likert scale (1 = No effect, and 7 = Great effect).

The third section probed management accounting/control practices with seven sets of measures. The name of each set, along with the response scale and sources from which it was developed, are as follows: *Formalization of Organizational Structure*: 14 items (1 = Extremely informal—not documented, to 7 = Extremely formal—fully documented) (Roth et al., 1991; Chenhall & Morris, 1986). *Decentralization*: 14 items (1 = No delegation to you, to 7 = Full delegation to you) and four other items (1 = Not used, to 7 = Used to great effect) (Brickley et al., 2000; Chow et al., 1996; Gordon & Narayanan, 1984). *TQC Procedures*: nine items (1 = Not used, to 7 = Used to great effect), *Financial Controls*: 17 items (1 = Not used, to 7 = Used to great effect) and *Performance Evaluation Style and Performance-based Incentives*: six items (1 = Not used, to 7 = Used to great effect) were adapted from six sources—Firth (1996), Chow et al. (1996), Shields and Young (1993), Briers and Hirst (1990), Simons (1987), and Khandwalla (1972). *Integrating Mechanisms*: 10 items (1 = Not used, to 7 = Used to great effect) adapted from five sources—Roth et al. (1991),

[6] While the theoretical model and hypotheses in this study uses the term "influence" to encompass several factors, these factors are described as forces, facilitators and barriers to change in the field interview section to provide an orderly presentation of the findings in as original detail as possible.

[7] The instrument was first developed in English. Then it was translated into Chinese by one of the bi-lingual research team members. The other bi-lingual research team member then made changes and corrections to this translation. The instrument was then evaluated by the first bi-lingual team member in discussion with the third research team member and final changes made. The English version of the questionnaire is available from the first author on request.

Adler (1991), Bartlett and Ghoshal (1989), Pascale (1985), Van Maanen and Schein (1979), and *Degree of Formal Controls*: 12 items (1 = Strongly agree, to 7 = Strongly disagree) based on Birnberg and Snodgrass (1988). Interviewees also were asked to provide a ratio that reflected the *mix of formal/informal processes* at their management level and the immediate level below.

The fourth section contained open-ended questions on the *purposes* behind the use of management accounting/controls and the *forces, barriers, and facilitators* to change in such use. Both senior and functional level managers were asked questions covering the accounting/control mechanisms. Questions on environmental influences, corporate governance and performance were only posed to the senior managers, as they are more likely to be knowledgeable about such issues. Table 1 shows that in all four SOEs, the use of management accounting/controls had increased between 1995 and 1997. This table also shows that a broad range of management accounting/controls was used by all four SOEs.

Content analysis

Content analysis (Yin, 1989) of the open-ended responses involved one of the authors classifying each cited event or action in terms of four categories—decisions affected by change in management accounting/control use, forces, barriers and facilitators of change. This analysis was performed in April 1998. It was repeated six months later (September, 1998) by another author. Comparing the two sets of results led to reclassifying several decisions affected by the change. Then, a total count of citations was used to rank events or factors under each of the four categories. Table 2 presents examples of the forces, facilitators and barriers taken from the content analysis. These data are reported separately for each enterprise and within each, the level (senior vs. functional management, identified as "S" and "F", respectively) of the interviewee.

Purposes and level of use of management accounting/controls

The reasons given by the interviewees for their enterprises' increased use of management accounting/controls were generally consistent with expectations: (1) To formalise the decision making process. A senior manager (Food-JV-SOE) noted: '*Pressure to increase sales and to decrease costs has forced management to formalise the use of management teams to make decisions in the areas of production quality, cost evaluation, sales and financial management*.' (2) To reduce manager decision error. A functional manager (Food-JV-SOE) noted: '*With the dynamic market situation sub-unit managers need more management standards to do a good job*.' Another functional manager (Elec-JV-SOE) put it this way: '*The market has become more complicated, so lower level managers need more formal guidelines/procedures to follow. There is now less time and margin for errors in decision making*.' (3) To increase the performance accountability of managers below the top level. All enterprises in the interview sample had experienced substantial annual growth over the past three to five years (range: 15% to 40%), and more formal procedures were seen as facilitating the evaluation of lower level managers. One functional manager (Food-SOE) put it this way, '*Performance evaluation has become more formalised in order for senior management to understand the higher and lower performing functional-level managers*.' A senior manager (Elec-JV-SOE) noted:

> *Increase in size (average revenue growth of 35% per year during the past five years) has caused a focus on the desire to minimize incorrect decisions and to increase the CEO's reputation. At the sub-unit manager level, greater formalisation was needed to support greater decentralization whereby functional managers have greater control over the operation situation of the lowest managers.*

The open-ended responses also provided specific examples of decisions that had become more formalised across the SOEs (except Elec-SOE). These related to sales and marketing procedures, human resource management, budgeting, and operations management. For both non-JV-SOEs (Elec-SOE and Food-SOE), budgeting and cost control procedures were reported to have become more formalised. A senior level manager of Elec-SOE

Table 1
Quantitative findings from on-site interviews[a]

	Joint venture Elec-JV	State-owned enterprise partner Elec-JV-SOE	State-owned enterprise Elec-SOE	Joint venture Food-JV	State-owned enterprise partner Food-JV-SOE	State-owned enterprise Food-SOE
Panel A: sign and percentage change in management accounting/control components—senior and functional manager responses[b]						
1. Formalization of organization structure	2%	39%	27%	16%	4%	35%
2. Decentralization	3%	10%	29%	22%	6%	13%
3. Approval and TQC procedures	2%	4%	13%	2%	10%	23%
4. Financial controls	1%	34%	9%	0%	0%	30%
5. Performance-based incentives	0%	25%	25%	0%	29%	14%
6. Performance evaluation style—rule-based	0%	8%	0%	32%	41%	51%
7. Performance evaluation style—relationship-based	2%	−7%	0%	−11%	18%	−16%
8. Integrating mechanisms	0%	−7%	23%	17%	35%	42%
9. Control system formality	2%	6%	29%	23%	33%	54%
Agreement between senior and functional managers on sign of change	High	High	High	High	Moderate	High

	Elec-JV		Elec-JV-SOE		Elec-SOE		Food-JV		Food-JV-SOE		Food-SOE	
Panel B: mix of formal/informal controls (total = 100)												
Senior manager:	1995	1997	1995	1997	1995	1997	1995	1997	1995	1997	1995	1997
Senior manager level	90/10	65/35	20/80	40/60	70/30	90/10	70/30	90/10	80/20	90/10	70/30	90/10
Perception about functional manager level	50/50	70/30	70/30	80/20	60/40	90/10	70/30	90/10	50/50	70/30	70/30	80/20
Functional manager:												
Functional manager level	40/60	60/40	40/60	70/30	40/60	60/40	45/55	65/35	30/70	40/60	60/40	80/20
Agreement between senior and functional managers about the degree and sign of change[c]:												
At functional manager level	High		High		Moderate		Moderate		Moderate		High	
Towards more formal procedures	High		High		Moderate		Moderate		Moderate		High	

[a] Based on site visits to four state-owned enterprises (SOEs) and two joint ventures in December 1997.

[b] % change was determined by dividing the difference between responses for 1997 and 1995 (3 years previous), by the 1995 response. All items were determined based on the average of senior and functional manager respondents.

[c] Example: for Elec-JV, 50/50 to 70/30 is rated as being highly similar to 40/60 to 60/40 in sign and extent of change.

Table 2
Influences on management accounting/control change in SOEs: content analysis of on-site interviews

Examples of influences extracted from content analysis[a,b]	ELEC		FOOD		Total number of times cited
	JV-SOE	SOE	JV-SOE	SOE	
Forces for change					
1. Increased market competition and/or complexity	S,F	S	S	S,F	6
2. Increased market size, company sales and employee growth	S,F			F	3
3. Holding company pressure, concern for CEO reputation	S		S	S	3
4. Government requests—to JV, mandated management system, tax and labour regulations		S	S		2
Facilitators of change					
1. In-house training—on the job, from senior managers	S,F	S,F	S	S,F	7
2. Training in local schools	F	S		S,F	4
3. Procedures transferred from the JV	S,F		S		3
4. Sending Chinese managers to the JV/overseas for training and development	S,F	S			3
5. Frequent communication from senior managers/informal meetings between staff	S	F		S	3
6. Training by government officials		S	S		2
Barriers to change					
1. Lack of managerial ability by functional or lower level management	S,F	S,F	S	F	6
2. Threat to the Chinese (culture and philosophy) way of doing things—Concern about loss of power, influence associated with having a good relationship with immediate superiors/Reliance on traditional bureaucracy/Loss of security of long term employment	F	S,F	S	S,F	6
3. Outdated performance/reward system—no connection between performance and rewards	F			S,F	3
4. Insufficient (or outdated) training, encouragement and/or government support	S,F		S		3
5. Government control over parts of organizational operations (e.g. labour management and investment)		S,F	S		3
6. Time requirement to learn and understand new techniques and procedures		S		F	2

[a] Number of cites by four senior and four functional managers in four state-owned enterprises in two industries: electrical (ELEC) and Food ($n=8$). Senior managers are identified as "S" and functional managers as "F". Only factors cited by at least two SOEs are shown.
[b] Only the SOE interviewee responses are shown. Details of the JV data can be obtained from the first author on request. Dates refer to beginning of 1995 and end of 1997.

noted, '*Formal procedures have been adopted for the purchase of assets. For example, approvals are now required for the purchase of equipment costing more than 100,000 Renminbi*.' The extent of change was seen as depending on the SOE's starting point, in part related to its JV experience. A manager of Elec-JV-SOE observed, '*The JV's adoption of such procedures was higher to begin with due to the contractual arrangements with the initial set up of the JV. In contrast, the SOEs are evolving from a socialist state system of control to a more market-based system, hence they have experienced greater change towards the adoption of management accounting controls*.' Finally, managers from all four SOEs noted increased communications about sales and human resource problems.

Influences on change

Most of the managers indicated that a major motivator for change was increased market competition and/or complexity, with six interviewees explicitly citing this factor (see Table 2). A senior manager (Food-SOE) observed: '*Competition is the main external force for change. This force is also enhanced internally through the CEO putting pressure on the senior managers to do better*.' Another senior manager (Elec-SOE) noted: '*The market situation has become more open: competitive environment*.' Other major forces for change were seen as holding company influence, concern for the CEO's reputation, increased market size, and company growth (both were cited three times). Government influence in the form of mandated management systems, tax and labour regulations were each considered a force for change by managers from two of the four entities.

Focusing on facilitators of change, seven interviewees cited in-house training as being an important factor. Training in local schools, and technology transfers from the JV were cited by four and three interviewees, respectively. Both JV-SOEs in the interview sample had adopted the approaches of their foreign JV partners in production, marketing and selling. The functional manager from JV-Elec-SOE said: '*There are forces from foreign joint venture partners to require the company to follow their procedures*.' The senior manager from Elec-JV-SOE observed: '*The joint venture provided necessary knowledge on how to manage product channels and markets...(It) provided the channel for learning more formal (sophisticated) purchasing and marketing management practices*.' At the same time, the degree to which the JV partner facilitated change was seen as being dependent on the Chinese JV partner (holding company). While Elec-JV-SOE obtained training from the Elec-JV, Food-JV-SOE did not reap the same benefit from its joint venture. The Food-JV-SOE's holding company did provide a source of training, but its limited participation in the Food-JV (only interested in the profits) led to little knowledge being transferred to Food-JV-SOE from the Food-JV.

The interviews also shed light on the nature of various barriers. In citing lack of managerial ability as a barrier, a functional manager from Elec-JV-SOE put it this way: '*It is time consuming to get managers up to speed with market developments and organization changes*.' A senior manager from Elec-SOE shed further light on the nature of this barrier: '*Managers' personal ideas about the business often were in conflict with the new environment they wanted to create, especially with older managers*.' The comment of a functional manager from Elec-JV further suggested that some barriers and facilitators may be connected: '*Traditional Chinese concepts held by management pose a barrier to new management techniques, therefore more training is required*.'

Comments also were made about a personal sense of insecurity from change, revealing that some of the barriers might be connected. A functional manager from Elec-JV-SOE stated: '*The change usually brought a signal of reduced demand of labour to workers*.' Along the same vein, a senior manager (Food-SOE) shared this experience: '*The employees did not accept change because they felt that they would stay in the company permanently. Making no change would be better. They felt that any change is associated with a change of employment terms within the company*.' In most cases (except Food-JV-SOE), the perceived threat to personal security was seen as the result of challenges to the Chinese management norms held by managers. These especially related to the sense of personal relationships (for rewards and promotion) and a sense of position and authority based on seniority (age) and term with the firm. As a senior manager (Food-SOE) put it: '*Older management has gained significant personal power through the old hierarchical system of bureaucracy based on personal relationships. Therefore they have been slow to accept the use of more formal procedures required to effectively compete in the marketplace*.' In turn, this reluctance to change may have contributed to employees' lack of trust in senior management.

Relating to external intervention, a senior manager of Food-JV-SOE noted: '*The senior managers want to learn new ways of increasing competitiveness but are constrained by what the government wants to teach them through the holding company. The government still uses its own ideas to manage both the holding company and its subsidiaries. The government has not changed the management of the holding company, nor has it changed the content of training provided*.' Another senior manager (Food-JV-SOE) put it this way: '*The management (of Food-JV-SOE) has no decision rights in the areas of human resources, investments and asset sales. The lack of rights in the de-employment of labour has been a major barrier to decreasing their costs. For example, they would like to decrease their employment headcount by 20% but have been prevented from doing so by the holding company*.'

Taken as a whole, the interview findings confirmed many of our expectations about the level of, and influences on Chinese SOEs' use of Western management accounting/controls. They also yielded useful insights into the avenues whereby impacts arise. As we explain in the next section, these insights were incorporated into the survey used to collect data for hypothesis testing.

Survey

Survey instrument

The survey instrument was based on the closed-ended items in the interview questionnaire, with modifications to reflect the interview findings. The instrument had three parts—organizational characteristics, management accounting/control mechanisms, and influences on change.

For management accounting/control mechanisms (see Table 3) several changes were made based on the interview findings. For example, decentralization (18 items in the interview instrument) was reduced to four items associated with approval procedures that were perceived by the interviewees to have changed the most during the period studied. Both degree of control system formality and formal/informal process mix were removed because their content is substantially covered by the retained items. Questions on the purposes of the management accounting/controls also were dropped. This was due, in part, to concern for the length of the survey.[8] Furthermore, we had not proffered hypotheses about such purposes. Instead, the effects or benefits of the management accounting/controls were assumed, and the interview findings had quite clearly supported the validity of these assumptions.

For organizational characteristics and influences on change, feedback from the interviews led to items being added to those listed in the interview instrument. Specifically, six items were inserted on the nature of employment contracts, two relating to exchange listing, and two on government influence. For example, *% of employees on limited-term employment contracts* comprised two items/groups (*managers and non-managers*) and required the respondents to indicate on a 5 point scale (100, 75, 50, 25, 0%) the percentage of each group that are on contract basis. Interview feedback also led us to modify the measures of influences of change. For example, we modified the measure of integrating mechanisms (informal controls) and combined it with the items used to measure the *availability of training* (see Table 4). This was in response to the interview finding that integrating mechanisms were used to facilitate the adoption of management accounting/controls, rather than being used as controls themselves. In similar fashion, the list of 14 environmental influences was merged with forces for change to remove redundancy that existed in the interview instrument. Several items comprising influences on change (including *Government Influence*) are shown in Table 4.

Finally, to reduce the threat of common response (Young, 2000), we used response scales for several independent variables (e.g. market competition, joint venture experience, stock exchange listing, size and age) that were different from the dependent variable. Also, the scale for government influence was in the same direction (1 = No effect, and 7 = Great effect) as the scale for "Western" management accounting/controls, thus reducing the chance that common response bias would allow us to accept hypothesis 5.

Survey sample

SOEs to be surveyed were identified based on information from the Ministry of Foreign Economic Relations and Trade. As with the interviews, we sought industries likely to yield a spread on the factors implicated in the hypotheses. The sample was selected from five industries: retail, electronics, textiles, plastics, and building materials. Government protected and closely controlled industries, such as telecommunications and mining, were excluded to avoid adding unnecessary noise to the data.

The survey was sent in 1999 to one senior and one functional level manager in each of 82 SOEs (sample population). The plan was to use the two responses from each SOE as a validation check on

[8] The concern with survey length was a response to the interviewed managers' shared admonition (and our personal experience) that the survey instrument had to be kept short to have a reasonable chance of being completed.

Table 3
Factor analysis of management accounting/controls

	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5	
	1996	1999	1996	1999	1996	1999	1996	1999	1996	1999
To what extent has your company established formal and written procedures/guidelines that employees must follow relating to the following items?[a]										
Formal Procedures (8 items)										
Development of new products or services	0.489	0.586								
Hiring and firing of managerial personnel	0.679	0.696								
Allocating the budget among alternate uses	0.620	0.526								
Pricing decisions	0.563	0.740								
From which sources to obtain inputs	0.749	0.774								
Scheduling of production operations	0.669	0.837								
Distribution of products/outputs	0.726	0.466								
Manager performance evaluation processes	0.605	0.408								
To what extent has each of the following management procedures and processes been used in your company?[b]										
Approval procedures (4 items)										
Hiring new employees (e.g. headcounts)			0.608	0.492						
Spending discretionary programme money			0.800	0.820						
Making capital expenditures			0.820	0.840						
Formal sector-level committee meetings			0.867	0.787						
Total quality control procedures (6 items)										
Total quality control circles					0.767	0.780				
Statistical quality control of production					0.786	0.808				
Materials requirement planning procedures					0.687	0.525				
Internal auditing procedures					0.438	0.545				
Performance or operational auditing					0.642	0.580				
Standard costs and variance analysis					0.549	0.468				
Budget targets (5 items)										
Use of budgeting for:										
(a) Cash/working capital							0.742	0.715		
(b) Sales or Profits							0.825	0.734		
(c) Production							0.773	0.671		
Annual or quarterly income/cost targets							0.679	0.699		
Monthly income/cost targets							0.446	0.618		
Performance targets (4 items)										
Use of budget goals for the purposes of:										
(a) Selecting employees for promotion									0.518	0.779
(b) Determining employees' bonus pay									0.751	0.569
(c) Selecting employees for recognition									0.634	0.743
Merit-based compensation contracts									0.521	0.658
Eigenvalues	2.561	10.073	1.686	2.656	10.527	1.516	1.769	1.825	1.343	1.383

[a] 1 = Extremely informal—not documented, 4 = moderate formality, 7 = extremely formal—fully documented.
[b] 0 = N/A or not used, 1 = no effect or used to no effect, 4 = some effect or used to some effect, 7 = great effect or used to great effect.

each other. Forty-seven SOEs returned only one completed response each, despite repeated follow up communications. Thirty of these 47 responses were from functional managers. In conjunction with the two responses each from the remaining 35 SOEs, there were a total of 117 respondents, 65 of which were functional managers (representing a functional manager response rate of 79.27%). All respondents indicated that they had been at the SOE for at least several years.

Table 4
Factor analysis of influences on the use of management accounting/controls

	Factor 1	Factor 2	Factor 3	Factor 4
Government Influence (2 items)				
Government ministry representative on the board of directors	0.80			
Activities of government representative in your firm	0.90			
Market Competition (5 items)				
Increased competition from foreign (overseas) enterprises		0.78		
Increased competition from domestic enterprises		0.72		
Increased market size		0.73		
Company growth in sales		0.78		
Desire to achieve ISO9000 or similar quality certification		0.61		
Availability of Training (5 items)				
In-house or on-the-job training by Chinese managers			0.73	
Training provided in local schools			0.79	
Training provided by government officials			0.62	
Frequent communication, informal meetings with senior managers			0.75	
Sending Chinese managers overseas for training and development			0.55	
Chinese Management Norms (3 items)				
Employees' personal concern for security of employment				0.71
Employees' lack of trust in the senior management				0.75
Employees' concern for loss of power and influence associated with having a good relationship with immediate superiors				0.74
Eigenvalues	1.178	1.471	3.481	2.175

We ran an independent samples *t*-test of means between the two respondents from each SOE (for the 35 SOEs with two respondents) across all items, and found non-significant ($P > 0.05$) differences in all but one item (formalization of pricing decisions). The hypothesis test results were qualitatively identical between using the average of the two responses for these 35 SOEs and the single responses from the other 47 SOEs, and using only the functional level manager responses. For simplicity, only the latter results are presented below.

Table 5 presents summary demographic data on the survey sample. On average, the SOEs had 3014 employees, with 68.75% of managers and non-managers being on contract terms that averaged 5.31 years in duration. Forty-four (53.66%) of the SOEs were currently listed on a stock exchange with an average listing history of about four years.[9] Forty-eight (58.54%) SOEs had JV experience. During the 1990 reforms, larger SOEs were more likely to be selected for listing or participating in a joint venture (Chen, 1998). Hence, we tested whether there was a size difference between listed and non-listed SOEs and JV and non-JV SOEs. No significant differences were found. The average size of JV SOEs was 2682 employees, as compared to 3483 for non-JV SOEs. The average size of listed SOEs was 3323 employees, as compared to 2657 for non-listed SOEs.

The level of and influences on use of management accounting/controls

Factor analysis using the varimax rotation yielded five distinct management accounting/control mechanism groupings (formal procedures, approval procedures, total quality control, budget targets, and performance targets, see Table 3), and

[9] Four of the SOEs had only been listed during 1998 or 1999. Analyses were run with and without these particular SOEs and the results for employment contract term and stock exchange listing were unchanged.

Table 5
Summary statistics: influences on, and use of management accounting/controls

	Alpha	Mean	S.D.	Min.	Max.
Panel A—influences on change					
% on limited-term employment contract—managers and non-managers		68.75%	30.89%	0.00%	100.00%
Market Competition	0.67	23.75	5.31	5.00	35.00
Joint Venture Experience? 0 = No, 1 = Yes		58.54%	49.57%	0.00%	100.00%
Stock Exchange Listing? 0 = No, 1 = Yes		53.66%	50.02%	0.00%	100.00%
Government Influence		6.34	3.59	0.00	14.00
Enterprise Size– Full time equivalent employees		3014.37	4131.76	100.00	32250.00
Chinese Management Norms	0.66	12.21	3.65	3.00	19.00
Enterprise Age (years)		19.91	19.10	3.00	97.00
Availability of Training	0.75	17.75	6.06	5.00	29.00
	Alpha 1999 (1996)	Mean	S.D.	Min.	Max.
Panel B—management accounting/control (MAC) use—1999 (1996)					
Formal procedures	0.89 (0.89)	39.49 (31.70)	7.55 (7.51)	17 (15)	56 (56)
Approval procedures	0.87 (0.88)	21.14 (17.21)	5.39 (6.26)	1 (1)	28 (28)
Total quality control procedures	0.82 (0.87)	27.25 (21.49)	7.71 (8.86)	3 (0)	40 (39)
Budget targets	0.84 (0.89)	24.43 (19.57)	6.37 (7.26)	0 (0)	35 (35)
Performance targets	0.76 (0.74)	15.67 (12.55)	6.05 (5.47)	0 (0)	28 (28)
Aggregate level of use of MACs (27 items)	0.92	127.98 (102.52)	25.23 (27.62)	37.00 (27.00)	172.00 (172.00)
	Number of firms with 0 or (−) change	Mean	S.D.	Min.	Max.
Panel C—sign of change in management accounting/control use—1996–1999[a]					
Formal procedures	27	3.94	3.81	−6.00	8.00
Approval procedures	26	1.80	2.05	−4.00	4.00
Total quality control procedures	26	2.78	2.86	−6.00	6.00
Budget targets	23	2.51	2.50	−5.00	5.00
Performance targets	37	1.63	2.09	−4.00	4.00
Aggregate sign of MACs change (27 items, Alpha = 0.95)	18	12.67	11.88	−25.00	27.00

[a] The sign of the difference between 1996 and 1999 responses for each management accounting/control practice (−1, 0 or 1) is summed for an additive sign score for each control and for the overall MACs change.

four influences (government influence, market competition, availability of training, and Chinese management norms, see Table 4).[10] All of these aggregate measures had acceptable reliability, as indicated by Cronbach alphas above 0.60, the generally accepted range of construct reliability (Carmines & Zeller, 1979).

Table 5, Panel B shows that all of the management accounting/controls had moved towards greater formalisation and explicitness between 1996 and 1999.[11] Since our hypotheses had focused on levels, attribution of differences in 1999 must recognize that the SOEs in the sample probably differed on the focal characteristics at the beginning of our study period (i.e. 1996), and these characteristics could have affected their use

[10] As noted earlier, our interviews also indicated that manager ability was a possible influence on the adoption of management accounting/controls. However, our survey responses did not distinguish this measure from training. First, the factor analysis resulted in the reward system being agglomerated with manager ability, such that we do not have a pure measure of the ability construct. Second, a strong positive correlation ($P < 0.01$) existed between our measure of ability and training, indicating the possibility of a response set bias. Including the ability factor in the regressions results did not change the significance of the other factors. For these reasons, we left ability out of the analysis of hypotheses.

[11] For subsections two (management accounting controls) and three (influences on change), survey respondents had mean ratings of 4.98 and 4.80, respectively (on a scale of 1 = low to 7 = high) of their confidence that their answers accurately reflected the reality at their enterprises in 1999 and 1996.

of management accounting/controls at that point in time. A comparison of adoption levels for 1996 indicated that this was the case for two enterprise characteristics—use of TQC procedures was significantly ($P<0.10$) lower in those SOEs with greater use of limited-term employment contracts, while budgeting targets had significantly ($P<0.10$) higher use in younger SOEs.

Different starting points across SOEs suggests that if our hypotheses are to be supported, a larger number of enterprise characteristics had to be involved in significantly different management accounting/control uses in 1999. For preliminary insights into this issue, we conducted independent samples *t*-tests for each of the nine factors in the hypotheses. There were significantly higher levels of: formal procedures ($P<0.10$), TQC procedures ($P<0.10$) and budgeting targets ($P<0.05$) with respect to training; TQC procedures ($P<0.10$) and budgeting targets ($P<0.10$) with respect to market competition; formal procedures ($P<0.10$), TQC procedures ($P<0.10$) and budgeting targets ($P<0.05$) with respect to stock exchange listing; and approval procedures ($P<0.10$), TQC procedures ($P<0.05$) and performance targets ($P<0.05$) with respect to joint venture experience. In short, whereas there were two significant differences in 1996, eleven such differences were found in 1999.

Hypothesis tests

The hypotheses were tested with a multiple regression of the following form:

$$Y = B_0 + B_1X_1 + \ldots B_9X_9 + \varepsilon \tag{1}$$

where Y = the index of management accounting/control use, and
$X_{1\ldots9}$ represented the following environmental and organizational characteristics:

X_1 = % of employees on limited-term employment contracts
X_2 = market competition[12]
X_3 = JV experience (0 = no, 1 = yes)
X_4 = Stock exchange listing (0 = no, 1 = yes)
X_5 = Government influence
X_6 = Firm size (log of number of employees)
X_7 = Chinese management norms
X_8 = Firm age (log of firm age in years)
X_9 = Availability of training

Consistent with the idea that management accounting/control mechanisms act as a package (Chow et al., 1994), our hypotheses had not differentiated among the various mechanisms. Based on this reasoning, our primary dependent variable was the sum of the 27 separate mechanisms' levels of use in 1999. The Cronbach (1951) alpha of this aggregate measure is 0.924.

Because the level-of-use index excludes consideration of each SOE's starting point in 1996, we supplemented it with a change-based measure. The latter was computed by assigning a score of +1, 0 or −1 to each of the 27 management accounting/control mechanisms based on the sign of change between the 1996 and 1999 levels, and then summing the 27 separate scores.[13] Since use of each management accounting/control mechanism could have increased, decreased, or remained the same between 1996 and 1999, the theoretical range for this index was −27 to +27. As shown in Table 5 (Panel C), the actual range of this index was −25 to +27, and its mean value was 12.67. The Cronbach alpha was 0.955. Across the 82 SOEs, 12 had an index value of zero, six had a negative value, and 64 had a positive value. On the whole, these figures indicate a generally increased use of the various management accounting/controls. At the same time, the considerable divergence across the SOEs, and the presence of zero and negative values, provide some assurance against the survey responses being dominated by demand effects.

The motivation for using only the sign (i.e. direction) of change was to limit potential errors

[12] This variable, along with government influence, Chinese management norms and availability of training are aggregate measures of each construct identified in the factor analysis reported in Table 4.

[13] Thus, if a particular accounting/control mechanism's extent of use was rated a "3" in 1996 and a "5" for 1999, a score of +1 was entered to reflect an increase in use. Conversely, if the rating for 1999 was "1" or "2", then a score of −1 was assigned to that mechanism. A score of 0 was assigned if the levels of use were equal in 1996 and 1999.

Table 6
Pearson correlations among variables

	1	2	3	4	5	6	7	8	9	10
1.% Of employees on limited-term employment contract										
2. Market competition	−0.215[a]									
3. Joint venture experience	−0.031	0.026								
4. Stock exchange listing	0.208[a]	−0.066	0.137							
5. Government influence	−0.270[b]	−0.007	−0.006	0.031						
6. Enterprise size—employees (log)	−0.019	−0.110	−0.093	0.085	0.116					
7. Chinese management norms	0.066	0.235[b]	0.011	−0.146	−0.091	−0.076				
8. Enterprise age (log)	−0.259[b]	0.073	−0.189[a]	−0.151	−0.169	0.327[c]	−0.095			
9. Availability of training	−0.194[a]	0.359[c]	−0.011	−0.063	0.282[b]	0.088	0.107	−0.091		
10. Aggregate level of use of MACS in 1999	0.111	0.190[a]	0.260[b]	0.222[b]	0.186	0.118	0.039	−0.023	0.294[c]	
11. Aggregate sign of MACs change (1996–1999)	0.005	0.064	0.143	0.252[b]	0.056	−0.044	0.008	0.056	0.115	0.523[c]

[a] $P<0.10$.
[b] $P<0.05$.
[c] $P<0.01$.

from the respondents' judgments and/or answers. Because we were not granted access to the SOEs' internal documents, we could not validate the accuracy of the responses. But we surmised that even if the reported magnitudes of change were inaccurate (e.g. a change was rated as being from "3" to "5" when it really was from "3" to "4"), the reported signs of change should be less subject to error. Thus, only considering the sign of change represented a conservative test.[14]

Descriptive data for all the variables are included in Table 5, while Table 6 shows the Pearson correlations among the variables. None of the pair-wise correlations among the independent variables is high enough to suggest the existence of a multi-collinearity problem.

The regression results for the two aggregate indexes are reported in Table 7. No observations exhibited violations of multivariate normality.[15] While the regression model for the level of use index was significant at the $P<0.01$ level, the same model for the sign of change was significant at the $P<0.10$ level. Note that for the expected negative influence of Chinese management norms, the predicted sign of this variable for H7 is positive because the question had asked about the extent to which it had prevented or slowed down change in the SOE.[16]

Table 7 shows that six of the nine regression coefficients based on the level-of-use index had the predicted signs. Of these, four are statistically significant:% of employees on limited-term employment contracts, joint venture experience, stock exchange listing, and availability of training.

[14] Regressions also were run with an aggregated index based on the magnitude of change. This index standardized the magnitude of change by the feasible change (e.g. if a SOE's use of a particular mechanism was at level "3" in 1996, then the most it could increase was two points on the 5-point scale; thus its actual change between 1996 and 1999 was divided by the number "2"). The results based on this index were substantially the same as those for the two indices reported.

[15] A high variance inflation factor (VIF) of the regression coefficient upon the error term is one indication of multicollinearity. "For standardized data, $VIF_I>10$ indicates harmful collinearity" (Kennedy, 1992, p.183). The VIFs in all regressions (reported in Tables 7 and 8) were very low, ranging from 1.115 to 1.656. The condition indices ranged from 4.348 to 18.940 between independent variables, comfortably below the moderate dependency range of 30 to 100 suggested by Belsley (1991, p. 56).

[16] In hindsight, asking such a directional question could have created a demand effect which jeopardized the validity of hypothesis testing results. The question about availability of training likewise was phrased directionally: "...facilitated or increased the rate of change..." For these two variables, we are unable to dismiss the possibility of a demand effect, and would note this as a caveat in interpreting the results. However, concern for this issue may be mitigated by the finding that these two variables were not uniformly significant across all management accounting/controls, as one might expect if there was a major demand effect. We also should note that the questions about the other influences on management accounting/control practices were phrased neutrally ("How much influence has it had...") and thus not subject to this concern.

Table 7
OLS regression results for overall management accounting/controls (MACs)

Independent variables	Dependent variables		
	Hypotheses (predicted signs)	Aggregate level of use of MACs in 1999	Aggregate sign of MACs change, 1996–1999
% Of employees on limited-term employment contract	H1 (+)	0.295[b]	0.061
Market competition	H2 (+)	0.096	−0.152
Joint venture experience	H3 (+)	0.419[c]	0.355[b]
Stock exchange listing	H4 (+)	0.254[b]	0.277[b]
Government influence	H5 (−)	0.164	−0.049
Enterprise size—full time employees (log)	H6 (−)	0.055	−0.061
Chinese management norms	H7 (+)	0.039	−0.060
Enterprise age (log)	H8 (−)	0.304[b]	0.313[b]
Availability of training	H9 (+)	0.431[c]	0.414[b]
Multiple adjusted R^2		0.267[c]	0.110[a]

[a] $P<0.10$.
[b] $P<0.05$.
[c] $P<0.01$.

These results provide support for H1, H3, H4 and H9.[17] The coefficient for enterprise age also was significant, but it was opposite in sign to that predicted. Its positive, rather than negative, coefficient indicates that older SOEs had higher usage levels of Western management accounting/controls in 1999.

Results from the sign-of-change regression were substantially the same (except for % of employees on limited-term employment contracts) as those based on the level-of-use aggregate index, suggesting that the differences in 1999 were not due to the SOEs' having started from different usage levels. This regression yielded six coefficients of the predicted sign. Of these, three are statistically significant: joint venture experience (H3) stock exchange listing (H4) and availability of training (H9). Also like the former, the coefficient for enterprise age was significant and opposite in sign to that predicted. The data that we collected did not permit further exploration of the potential reasons for this finding (or for the lack of support for the remaining hypotheses). In the case of enterprise age, we do feel that it is possible to rule out the possibility of younger SOEs having experienced greater diffusion of management accounting/controls in an earlier reform period (for example, Firth, 1996). This possibility (or its opposite, that older SOEs had begun the 1996–1999 period with higher levels of adoption) would have been manifest in the regressions based on sign-of-change.

Additional analyses

As we had reported earlier, the factor analysis had identified five distinct management accounting/control groupings (Table 3). As such, the aggregate results could have obscured significant relationships that only held for specific accounting/control practices. To explore this possibility, we also computed the level and change indices for each of the five management accounting/controls groupings, and used them as alternate dependent variables in Eq. (1). Table 8 shows the eight regressions out of ten (five regressions for each index) that were statistically significant. The results reveal different patterns of relationship among management accounting/control practices and the factors in our hypotheses.

Considering level-of-use in 1999, use of limited-term employment contracts was significant for

[17] Since Firth (1996) had used the percentage of sales for export as a proxy for the market competition faced by a SOE, we also ran the regression with this alternate measure. The coefficient for market competition remained insignificant.

Table 8
Significant OLS regressions for different management accounting/control (MAC) groupings

Independent variables	Dependent variables				
	Formal procedures	Approval procedures	TQC procedures	Budget targets	Performance targets
Panel A: dependent variable—level of use of MACs in 1999					
% Of employees on limited-term employment contract	0.240	0.356[b]	0.261[a]	0.237	0.135
Market competition	0.108	−0.057	0.344[b]	0.149	−0.242
Joint venture experience	0.276[b]	0.457[c]	0.374[c]	0.348[b]	0.311[b]
Stock exchange listing	0.269[b]	0.089	0.258[b]	0.265[b]	0.142
Government influence	0.239	0.116	0.112	0.179	−0.065
Enterprise size—full time employees (log)	0.092	−0.071	0.137	0.022	−0.001
Chinese management norms	0.070	0.009	0.057	−0.083	0.086
Enterprise age (log)	0.213	0.282[a]	0.260[a]	0.275[a]	0.250
Availability of training	0.292[a]	0.561[c]	0.172	0.329[b]	0.533[c]
Multiple adjusted R^2	0.177[b]	0.260[c]	0.247[c]	0.153[a]	0.107[a]
Panel B: dependent variable—sign of MACs change, 1996–1999					
% Of employees on limited-term employment contract			0.054	0.011	0.118
Market competition			−0.153	−0.224	−0.273
Joint venture experience			0.480[c]	0.276[a]	0.339[b]
Stock exchange listing			0.273[b]	0.328[b]	0.148
Government influence			−0.003	−0.053	−0.021
Enterprise size—full time employees (log)			−0.102	0.023	−0.041
Chinese management norms			0.002	−0.117	0.045
Enterprise age (log)			0.389[b]	0.291[a]	0.401[b]
Availability of training			0.276[a]	0.422[b]	0.445[b]
Multiple adjusted R^2			0.199[b]	0.138[a]	0.105[a]

[a] $P<0.10$.
[b] $P<0.05$.
[c] $P<0.01$.

approval procedures and TQC procedures, while joint venture experience was significant for all five management accounting/controls groupings. Stock exchange listing was significant for formal procedures, TQC procedures and budget targets, while availability of training was significant for formal procedures, approval procedures, budget targets and performance targets. Fewer significant coefficients were found for the three significant regressions based on the sign-of-change index. Both joint venture experience and availability of training had significant coefficients for TQC procedures, budget targets and performance targets, while stock exchange listing was significant for TQC procedures and budget targets. Enterprise age was significant for TQC, budget targets and performance targets. But as is the case with the aggregate indices, all three coefficients were opposite in sign to that expected. Perhaps of greater interest, a significant coefficient emerged for market competition. Market competition was significant for the level of use of TQC procedures, perhaps reflecting their benefits to SOE competitiveness in the marketplace.

These results admittedly are ad hoc, and may be subject to alternate explanations to those given. Nevertheless, on the whole they do provide general support for the roles of limited-term employment contracts, joint venture experience, stock exchange listing, and availability of training. They also suggest the need for further analysis by showing that the relationship among SOE attributes and management accounting/control practices is not a constant across attributes and practices.

Summary, conclusions and suggestions

Using the notions of institutional and agency theory as a foundation, we hypothesized that the adoption of Western management accounting/controls by China's SOEs would be subject to nine factors. These encompassed ones at the macro-environmental level (market competition), the institutional level (limited-term employment contracts, joint venture experience, stock exchange listing and government influence), as well as the level of the organization (size, Chinese management norms, age and training). Findings from both interviews (focusing on 1995–1997) and a survey (focusing on 1996–1999) indicate that China's SOEs had increased their use of management accounting/controls in this recent period. These accounting/control mechanisms could be separated into five distinct groupings—approval procedures, formal procedures, TQC procedures, budget targets and performance targets. Interviews conducted at four SOEs suggested that this move towards more formal and transparent management accounting/controls was a purposeful one. The main objectives were to improve decision-making and to increase performance accountability. Generally consistent with our expectations, the interviews indicated that the change in accounting/control practices was a response to an increasingly competitive environment, and also influenced by institutional factors such as joint venture experience and stock exchange listing. The interviews also identified several obstacles to change, including government or holding company interference or withholding of decision rights, managers' lack of ability, and individual employees' resistance to erosion in job security and the ability to rely on informal business relationships.

Survey data from 82 SOEs permitted formal tests of nine hypothesized relationships. The directions of effects were mostly as predicted, but only a subset of the relationships was statistically significant at conventional levels. Consistent with the findings of Firth (1996) from an earlier period, joint venture experience was found to significantly increase the use of Western management accounting/controls. But unlike Firth (1996), the effect of market competition was not significant (except for the adoption of TQC procedures). Four other variables not in Firth's study were found to be significant. While percentage of employees on limited-term employment contracts, stock exchange listing and the availability of training enhanced the extent to which Western management accounting/controls were used, age of the SOE had a negative effect.

By focusing on a recent period, an expanded set of independent variables, and a comprehensive—if not exhaustive—set of management accounting/controls, this study has advanced understanding of recent developments in Chinese SOEs' management accounting/control practices. The findings indicate that such practices can be influenced by external forces and parties (e.g. limited-term employment contracts, joint ventures, stock exchange listing), as well as attributes of the organization and its individual constituents (e.g. availability of training and enterprise age). As such, they can be informative for policy-makers intent on reforming the management practices of China's business enterprises. Since some of the significant factors are likely to be within management's control (e.g. joint venturing and the provision of training), the findings also may assist SOE managers in promoting change. More broadly, the findings also shed light on factors influencing the diffusion of management accounting practices across national boundaries, and may be informative to policy-makers and managers of other nations seeking to promote the diffusion of more formal and transparent management accounting/controls.

Despite providing new insights, our study has only scratched the surface of this complex phenomenon. In particular, its findings are only based on managers' perceptions and what they had chosen to reveal of them in responding to a survey or interview. While the consistency among independent respondents within each SOE, in conjunction with the divergence across SOEs, provide some support for data reliability, there still exists a need to triangulate with other data collection techniques, such as examining the enterprises' procedure and policy manuals and other internal documents. Obtaining such access can be a daunting task, at least in the China context. Our request for access to such materials was declined by all four SOEs that we interviewed. And despite having a relatively lengthy instrument for a study of this type, our measures still only captured the variables of interest at highly aggregated levels (e.g. the nature of competition). We also were precluded from exploring interrelations among variables (e.g. how the nature of competition may affect the strengths of other influences of change, and how these interactively affect the extent of change) due to a high ratio of variables to number of observations.

This last-mentioned caveat is made more salient by the contrary findings between our study and that of Firth (1996), and between the interview and survey parts of our study. Relating to Firth (1996), our failure to find a similar significant effect due to market competition may be due to differences in the scope of our measures. But it also could reflect the ascendancy of other factors (e.g. stock market listing) in the more recent period that we study, especially given the reforms in this period. It also may be that market competition's effect is non-linear with respect to some threshold, and most or all of the SOEs in our sample were on the same side of this threshold level. A similar caveat applies to all of the other independent variables, with the general issue being the functional form of the relationship between independent and dependent variables: Is it discrete or continuous? And in the latter case, is it linear or exponential? Differentiating among these plausible alternatives requires both the ability to assess tradeoffs among causal factors, and a high level of variance in the independent variables.

Focusing on the divergence of findings between our interview study and survey, the much larger sample size for the latter would seem to lend its findings greater credence. Yet, as with other surveys, the findings are influenced by such factors as adequacy of the measurement scales (e.g. scope, convergent and divergent validity) and issues of response bias as discussed earlier in this section (Birnberg, Shields and Young, 1990). Also, for purposes of promoting change, it is important to gain insights into such questions as ''How do various factors (e.g. Chinese management norms, training) affect the extent of change and its course?'' ''What approaches were, or may be, effective at utilizing these factors in dealing with pressures for change?'' As compared to the interview approach, surveys are less effective at producing in-depth findings to questions of this type. In total, the preceding discussion suggests that future research should seek an expanded sample size and range of industries covered, and be open to alternate sets and definitions of variables. A multimethods approach (Birnberg et al., 1990) also should be a high priority. Such refinements are likely to be costly, yet worthwhile in view of the potential use and impact of the findings.

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Appendix A. Open-ended questions—questions for the senior manager[a]

1. Based on the questions that had been addressed up to this point, it seems that some of the management processes at your enterprise are more formalized than others. In addition, your enterprise may use other processes that were not included in our list, such as one-on-one meetings, and verbal instructions and directives given at meetings. In your assessment, what are the relative impacts of the formal processes versus informal processes on the decisions that you have made in managing your organizational unit? Please distribute 100 points between the two such that they sum to 100.

3 years ago	Formal processes	__________	**Present**	Formal Processes	__________
	Informal processes	__________		Informal processes	__________
	TOTAL:100			TOTAL:100	

2. Could you give some examples of how your decisions in managing your organizational unit had been affected by the change (presumably increase) in the formal component of your company's management systems and processes in the past three years?
3. Could you give some examples of how your decisions in managing your organizational unit had been affected by the change in the informal component of your company's management systems and processes in the past three years?
4. Please consider the mix of formal versus informal management processes currently applied by your enterprise to unit at your organizational level. Do you feel that the current mix is the one that the enterprise had wanted to change to? If not, in what major ways do you think the current mix diverges from what the enterprise had wanted it to be?
5. When your enterprise changed the mix of formal versus informal processes that it applies to your organizational unit level from three years ago to now, what were the most important factors that facilitated the change in the direction that the enterprise desired?
6. What were the most important obstacles that prevented the enterprise from changing as much as it had desired?
7. What were the main forces for the change in management processes?
8. Please think about the managers below your level who can be considered the first line of managers with authority over both revenues and costs, rather than just one or the other. Also, please refer back to our discussion of formal versus informal management processes, including the possibility of using other processes that were not included in our list, such as one-on-one meetings and verbal instructions and directives given at meetings. In your assessment, what are the relative impacts of the formal processes versus informal processes on the decisions that managers at that level have made in managing their organizational units? Please distribute 100 points between the two such that they sum to 100.

3 years ago	Formal processes		**Present**	Formal Processes	__________
	Informal processes	__________		Informal processes	__________
	TOTAL:	100		TOTAL:	100

9. Again, please think about the managers below your level who can be considered the first line of managers with authority over both revenues and costs, rather than just one or the other. Please consider the mix of formal versus informal management processes currently applied by your enterprise to how managers at that level manage their organizational units. Do you feel that the mix currently in use is what the enterprise had wanted for that level of the organization? If not, in what direction do you think the current mix diverges from what the enterprise would like?
10. Again, please think about the managers below your level who can be considered the first line of managers with authority over both revenues and costs, rather than just one or the other. When your enterprise changed the mix of formal versus informal processes at that organizational unit level from three years ago to now, what were the most important factors that facilitated the change in the direction that the enterprise desired?
11. What were the most important obstacles that prevented the enterprise from changing as much as it had desired?
12. What were the main forces for change in management processes below your level?

[a]Same questions were asked of the functional manager, except for the level to which 1, 8 and 9 were addressed.

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