The determinants of the discretionary purchase of property insurance by publicly listed companies in the People's Republic of China.

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THE DETERMINANTS OF THE DISCRETIONARY PURCHASE OF PROPERTY INSURANCE BY PUBLICLY LISTED COMPANIES IN THE PEOPLE'S REPUBLIC OF CHINA

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This study is dedicated to my wife, **Jenny**,
for her unwavering love and support.

DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 INTRODUCTION

1.1.1 Background

This study examines the determinants of the discretionary purchase of property insurance by publicly listed companies in the People's Republic of China (PRC)[1,2,3]. The necessity to research this subject is underpinned by prior studies conducted in developed insurance markets such as the United States (US) (e.g., Mayers and Smith, 1982, 1986; Davidson, Cross and Thornton, 1992; Hoyt and Khang 2000), Canada (e.g., Core, 1997), the United Kingdom (UK) (e.g., Ashby and Diacon, 1998; Main, 1983, 2000), and Japan (e.g., Yamori, 1999). These studies argue that risk aversion provides an economic rationale for both individuals and small and closely-held companies to purchase insurance where direct diversification of firm-specific (unsystematic) risks may not be

[1] The People's Republic of China (PRC) in this study refers to mainland China, but excluding Hong Kong, Macao and Taiwan. These Chinese territories are outside the scope of this study because they differ substantially from the PRC in terms of their legislative structures, western economic-based history, long established financial markets and company regulation (e.g., see Naser and Wallace, 1995; Cheung and Chow, 1999; Gul, 1999). The terms "China" and "PRC" are also used interchangeably in this study. Additionally, the Chinese Pinyin system of translation is used in this thesis, where necessary, to convert Chinese characters into the Roman alphabet.

[2] Rejda (1998, p.19) defines insurance as " . . . the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insured for such losses, to provide other pecuniary benefits on their occurrence, or to render services connected with risk". Article 2 of the Chinese *Insurance Law* (1995) also provides an equivalent definition of insurance. Therefore, the concept of insurance provides a similar, but nonetheless, distinct function from other risk transfer/hedging mechanisms such as tradable derivative instruments. Additionally, the term "property" used in this study relates to physical assets such as buildings and inventories rather than to intangible assets such as goodwill and brands.

[3] Companies in this thesis refer to those corporate bodies registered under China's *Companies Law* (1993). Also, the terms "company", "corporation", "firm", "enterprise", "entity" and "organization" are used interchangeably in this study. Additionally, publicly listed companies are defined as those joint-stock companies which satisfy the listing criteria determined in the *Companies Law* (1993) and the *Provisional Ordinance on the Issue and Trade of Shares* (1993) to list shares at the Shanghai Stock Exchange (SHSE), the Shenzhen Stock Exchange (SZSE), or at stock exchanges outside mainland China.

available – for example, due to insufficient financial resources, limited risk management expertise and so on. However, risk aversion by owners cannot by itself satisfactorily explain the large amount of insurance purchased by large and widely-held companies (Main 1982a, 1982b) [4] . For instance, neo-classical financial economics-based theories/models, such as the capital asset pricing model (CAPM) (Sharpe, 1964; Lintner, 1965; Mossin, 1966), predict that in efficient markets it is more cost-effective for investors to diversify unsystematic risks by holding balanced portfolios of investments than it is for them to purchase (potentially costly) commercial insurance. Although some kinds of insurable systematic risks (e.g., regional property damage arising from a severe earthquake or flood) are difficult to be diversified effectively by holding a balanced portfolios of investments, Main (1983, p.198) contends that in the presence of the loadings in insurance transaction (e.g., insurer's expenses and profit), ". . . the premiums charged for any available insurance against systematic risks will be high enough to deter corporate purchase." Thus, *prima facie*, the purchase of insurance by large and widely-held companies that seek to transfer unsystematic and systematic risks might not add value for shareholders (e.g., see Main, 1982a, 1982b, 1983).

Therefore, risk aversion by investors may not by itself be the main reason for the purchase of insurance by large and widely-held companies. Indeed, the modern firm can be viewed as a "nexus of contracts" among various constituents (e.g., owners, managers, creditors, employees) who may have incompatible and conflicting interests (e.g., see Jensen and Meckling, 1976). Therefore, it is not obvious which of the contracting parties in the firm would benefit from the corporate purchase of insurance. Moreover, many large corporations - often grown out of mergers and acquisitions (M&A) - may not only diversify their business across industries and/or geographically but also be able to self-retain a large portion of business risk. For instance, Doherty and Smith (1993) report that the large oil and gas conglomerate British Petroleum (BP) only insures externally against most relatively small exposures while large risks are self-insured.

[4] The criterion for "widely-held company" suggested by Mayers and Smith (1990) refers to a company with more than 100 shareholders. This criterion of the span of corporate ownership-control is commonly used in prior insurance-based research.

Therefore, an important question that emerges from the extant literature is this: what are the motives behind the corporate purchase of insurance? In attempt to address this question, a number of researchers (e.g., Main, 1982a, 1983; Mayers and Smith, 1982, 1987; Skogh, 1989, Davidson et al., 1992) have used financial economics-based theories, such as agency theory, to identify key motivating factors (other than the risk aversion of owners) to explain the decision of managers in large and widely-held companies to purchase insurance. For example, corporate insurance purchases may be explained by bondholders' "me-first" rules – that is, where corporations buy insurance as the result of creditors' demand for protection against financial losses in the event of bankruptcy. In turn, insurance could thus allow corporate lenders (e.g., banks) to lower their interest charges thereby increasing the value of the borrowing firm (e.g., see Davidson et al., 1992). Additionally, Main (1982b, 2000) argues that corporate insurance can help to assure customers and investors about an entity's ability to remain a going concern and avoid costly bankruptcy. Nonetheless, Yamori (1999, p.24) reports that to date a major limitation is that " . . . hypotheses have not been substantially tested by actual data . . . [thus] knowledge regarding whether previous theoretical predictions are valid is very limited." Clearly, therefore, more empirical tests of theoretically grounded hypotheses need to be carried out, particularly in large but under-researched emerging markets like China.

1.1.2 The Chinese Insurance Industry

The last twenty years or so have witnessed the exponential growth in the corporate purchase of insurance in the PRC. Indeed, Ma, Lin and Ma (1998) report that over the last two decades growth in insurance premiums in commercial lines has exceeded 30 percent per annum in China. In absolute terms, PRC-based companies accounted for annual premiums of approximately RMB 30 billion (US$ 3.6 billion) in 1999, representing over 70 percent of the non-motor general insurance market (People's Bank of China (PBOC), 2000)[5]. Despite such dynamic growth, many industry

[5] The Chinese currency is Renminbi (RMB). The exchange rate used in this study is US$ 1=RMB 8.3, which was the officially fixed exchange rate set by the central bank (the PBOC) during the period of empirical analysis (i.e., 1997-99).

commentators (e.g., Niu, 1995; Ma et al., 1998; A.M. Best, 1999; Shen, 2000) forecast that the corporate demand for insurance in the PRC will continue to increase in line with the country's rapidly expanding rate of inward investment and developing economic infrastructure. Furthermore, future growth in corporate insurance procurement is also likely to be encouraged by the ongoing reform of State-owned enterprises (SOEs) in the PRC and China's joining the World Trade Organization (WTO) (e.g., see Ma et al., 1998; Li, 1999; Shen, 2000; Xu, N., 2000). To date, empirical studies have not examined the determinants of corporate purchase of property insurance in the PRC as " . . . the scarcity of reliable data has long constituted a major obstacle for analyses of the Chinese business environment" (Luo and Sadrieh, 1995, p.24). However, emerging economies, such as China, are becoming progressively integrated into the global economic system and concomitantly adopting improved corporate reporting practices (Xiao, 1999; Shen, 2000). These changes are now providing a good opportunity for researchers to test further and/or refine financial economics-based theories that were primarily developed and tested in Western developed countries (e.g., see Shenkar and Von Glinow, 1994; Tan and Litschert, 1994; Luo, 1999).

1.2 AIM AND OBJECTIVES OF THE STUDY

Drawing a framework from the financial economics literature, this study examines empirically those factors that influence: (a) the managerial propensity to purchase property insurance (hereafter as "insurance participation decision"); and (b) the financial extent of property insurance use by publicly listed companies in the PRC (hereafter as "insurance volume decision"). To achieve this aim, the study has five specific objectives:

1. To analyze the institutional environment within which Chinese publicly listed companies operate. In particular, the unique setting of China's financial markets and the salient features of PRC-based publicly listed companies are examined.

2. To select an appropriate theoretical framework by means of an extensive review of the extant financial economics literature.

3. To develop hypotheses drawn from the selected theoretical framework, and test them empirically using statistical techniques.

4. To analyze and evaluate the empirical results.

5. To make conclusions and consider the implications for policymaking and future research.

1.3 CONTRIBUTION TO KNOWLEDGE

This research project contributes to the existing insurance and risk management literature and generates regulatory/practical implications in six principal ways as follows:

1. The pattern of economic reform in the PRC over the last two decades or so has been transitional; this contrasts sharply with the more revolutionary economic changes taking place in some former State-planned economies of Eastern Europe (e.g., see Booth and Stroinski, 1996; Qian, Roland and Xu, 1999; Tam, 2000). Therefore, the key determinants of the corporate purchase of insurance in the PRC might be similar to, or different from, those of developed market economies (e.g., the US), existing planned economies (e.g., Cuba), and the newly opened-up economies of Eastern Europe (e.g., Poland). This study, as the first of its kind, should thus contribute important insights into the nature of insurance decisions in newly/partially privatized publicly listed companies that are emerging in China's transitional economy. For example, the results of the research could highlight how different ownership structures in Chinese publicly listed companies might influence the extent to which property insurance is purchased.

2. This study uses firm-level panel data for 1997-99 to derive robust tests of formulated hypotheses on the corporate purchase of property insurance. Thus, some of the data limitations experienced in prior studies (e.g., the use of single-period data) are mitigated in this project[6]. Additionally, the tight control over property insurance pricing in the PRC during the research period 1997-99 is likely to avoid some potentially confounding effects caused, for example, by fluctuations in insurance pricing and changes in insurers' underwriting practices on corporate purchase of property insurance. Thus, the variations in the level of premiums paid by PRC-based publicly listed companies are more likely to reflect changes in managerial discretion rather than external factors such as volatile movements in market forces. It is considered that this attribute enables a more robust test of the research hypotheses to be performed. Moreover, by employing a two-stage analytical approach (i.e., analyzing the determinants of insurance participation and volume decisions separately), this study should be able to generate more informative insights into company managers' insurance decisions than previous studies (e.g., Yamori, 1999; Hoyt and Khang, 2000).

3. As noted in section 1.1.2, the study of a large emerging insurance market, such as China, provides an opportunity for testing and refining financial economics-based theories on the corporate purchase of insurance that have hitherto been tested in developed economies. The methodology and results of this study could thus act as a useful framework and benchmark for future insurance-based research in both the PRC and other Asian countries, particularly those with a similar economic structure and political history to China (e.g., Vietnam – see Bucheton and Cominh, 1995).

[6] Yamori (1999) is believed to be the first study that empirically investigates the purchase of insurance by non-financial corporations in a major non-Western economy, namely Japan. However, this and other prior studies have only used single-period data. It is argued by many researchers (e.g., see Hsiao, 1985; Solon, 1989; Baltagi, 1995) that analysis using panel data can have many advantages. For instance, panel data " . . . give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency" (Baltagi, 1995, p.4).

4. The research project could have important implications for policymakers and corporate stakeholders (e.g., shareholders and debtholders). For example, the extent to which the level of commercial property insurance complements or substitutes for other loss recovery mechanisms, such as State-funded contingent capital, could help policymakers to better identify and assess the adequacy, or otherwise, of current corporate risk management practices in PRC-based publicly listed companies. This could assist in the design of future economic (e.g., financial regulatory) reforms in the Chinese corporate sector. Additionally, the results from this study could help to answer key policy-related questions like whether corporate debtholders and/or shareholders need to monitor more closely the corporate risk management practices in China.

5. The present study could help to direct the marketing strategies and product innovation initiatives of insurance suppliers (including foreign insurers operating in the PRC) by shedding light on how they could better target potential customers. For instance, if the findings reveal that those companies with substantial foreign-invested capital are more likely to demand property insurance than majority Chinese-owned companies, then insurers may wish to develop their product strategies to better reflect on the risk management needs of multinational organizations.

6. The results from this study could be useful for Chinese company managers – for example, by enabling them to better understand the effects of insurance purchases on business operations. This could also help them improve their risk management practices in the future.

1.4 RESEARCH METHODS

To achieve the above stated aim and objectives of this project, a combination of literature-based and quantitative research methods are adopted in this study as follows:

1. A search and analysis of the relevant literature, leading to the selection of an appropriate theoretical framework to guide the empirical investigation.

2. The empirical component of this study involves a statistical analysis of firm-level panel data for the period 1997-99. Both univariate and multivariate statistical techniques (e.g., Heckman's two-stage sample selection analysis) are used. Data on firm-specific variables (i.e., the explanatory variables in this study) are extracted from two public databases (the *Genius Securities Information Database* (GSID) and *Hong Kong & Macao Securities Information System* (HKMSIS)), which contain details of the published annual financial statements of PRC-based publicly listed companies. The dependent variables (i.e., purchase/non-purchase dummy and corporate spending on property insurance) are identified either from voluntary disclosures in annual financial statements or directly from company Financial Directors/Treasurers through a telephone survey. (For further details, see section 5.3)

1.5 ASSUMPTIONS AND SCOPE

1.5.1 Assumptions

This study has six underlying assumptions as follows:

1. A high degree of managerial discretion over insurance decisions is assumed to exist in PRC-based companies. This assumption is deemed to be justified as several commentators have reported that considerable progress has been made in terms of the degree of autonomy given to company managers since China embarked on its reform programme in 1978 (e.g., see Ma, 1998; Chi, 1999; Tam, 2000). For instance, the decision-making rights of managers (e.g., on making insurance purchases) in publicly listed companies are empowered by Article 119 of China's *Companies Law* (1993). Additionally, the *Insurance Law* (1995) sets forth the voluntary basis for commercial insurance purchase decisions in the PRC

(Article 4 and 10). Thus, managers of publicly listed companies in the PRC are considered to be able to make insurance choice decisions independently of State officials.

2. Procurement of commercial property insurance is assumed to constitute one of the most important risk management mechanisms available to managers of publicly listed companies in the PRC. This assumption is believed to be reasonable because complete risk retention and self-insurance are normally impractical for most Chinese companies due to their limited assets size, insufficient accumulated reserves and the general lack of risk management expertise (e.g., see Graham, 1996; Tian, 2001)[7]. In addition, alternative risk management instruments (e.g., financial derivatives) are generally not available for most companies in the PRC due to the absence of locally developed derivatives markets and limited managerial expertise (e.g., see Karmel, 1996; Long, Payne and Feng, 1999).

3. This study is predicated on the notion that insurance suppliers in the PRC can satisfactorily meet the corporate demand for insurance. In other words, it is assumed that insurance demand is not severely restricted by an inadequate market supply of insurance. Indeed, the current availability of over 300 different kinds of commercial insurance products and 29 insurers in the Chinese market-place testifies to the reasonableness of this assumption (e.g., see Wu, 1996; Wei, Yu and Guo, 1999).

4. In this research project, variations in the level of corporate property insurance spending of Chinese publicly listed companies are deemed to mainly reflect the in-house demand for insurance coverage rather than changes in the market pricing of risks underwritten by insurance companies. This approach is consistent with that followed in prior studies (e.g., Yamori, 1999; Hoyt and Khang, 2000).

[7] By international standard, the size of publicly listed companies in the PRC is also fairly small in terms of the average total assets (around US$ 11million) and net assets (roughly US$ 5.5 million) in 1997 (CSRC database (2000)).

Moreover, this assumption is justified given the tight regulation of property insurance premiums and the observed insensitivity of insurance prices to market conditions in the PRC (e.g., see Wu, 1996; Shen, 2000; Wang, 2000). (For further details, see section 2.5)

5. Firm-specific data are obtained from two publicly available databases (i.e., the GSID and the HKMSIS) which, as mentioned earlier in section 1.4, are sourced from the audited annual financial statements of Chinese publicly listed companies. Details of discretionary premiums paid are derived by financial managers from in-house accounting systems that are also normally subject to independent audit review[8]. Thus, the data to be used in this study are assumed to be reliable.

6. In this study, it is assumed that there is a positive theoretical linkage between the decision to participate in insurance hedging and the decision on the financial extent of insurance use by publicly listed Chinese companies. Indeed, this assumption is implicit in previous studies of corporate hedging behavior such as Colquitt and Hoyt (1997) and Hardwick and Adams (1999)[9].

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[8] Graham (1996) reports that the audits of many publicly listed Chinese companies, in particular companies issuing shares to foreign investors, are often performed by international accounting firms, such as Price Waterhouse Coopers and KPMG Peat Marwick. Also, it is argued that the corporate accounting system in the PRC has since the 1990s moved closely towards international accounting practice (e.g., see Winkle, Huss and Chen, 1994; Gul, 1999). Additionally, DeFond, Wong and Li (2000) report improvements in auditor independence after China's new Auditing Standards, which are based on International Auditing Standards, came into effect in 1995. These observations of the increasing professional nature of external auditing in China further help to support the assumption that the data used in this study are reliable.

[9] However, Cummins, Phillips and Smith (2001) argue that interrelations between the hedging participation and volume decisions could be influenced by the differences in transaction costs. For example, they argue that in the case of derivatives hedging, the participation decision may be influenced by the large fixed costs associated with engaging such activity; in contrast, the volume decision can be influenced by differential risk tolerances and marginal cost considerations. Consequently, the hedging participation and volume decisions may not necessarily be positively related. However, a similar argument may not hold for insurance trading. This is because the purchase of commercial insurance is generally easier (and hence less costly) to establish compared with an in-house derivatives function. Indeed, Nance, Smith and Smithson (1993) argue that scale economies appear to be less pronounced in trading of insurance. Therefore, the assumption made here seems to be reasonable.

1.5.2 Scope of the Project

The scope of this project is defined in seven major respects as follows:

1. Only publicly listed companies are investigated in this project because the evidence obtained from such entities is likely to be more relevant in the PRC context[10]. Corporate forms in the PRC encompass non-company enterprises and companies; the latter include limited liability companies (LLCs) and joint-stock companies (referred to as "shareholding enterprises" in the PRC). Non-company SOEs and LLCs are not examined in this study. The former are essentially non-commercial entities whose existence derives from the old centrally planned economy and most of them (particularly those large SOEs) are scheduled to be restructured into publicly listed (joint-stock) companies in the near future (e.g., see Ma, 1998; Tam, 2000). The LLCs on the other hand, as mainly closely-held enterprises, do not satisfy the criterion of widely-held corporation (e.g., see Article 20 of *Companies Law* (1993)). As such, this project only focuses on publicly listed (joint-stock) companies, which the Chinese government deems to be the dominant form of "modern enterprise systems" [11]. In addition, under Article 156 of *Companies Law* (1993) only publicly listed companies are required to publish audited annual financial statements and make these available for public scrutiny.

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[10] Only those companies listed at the two main PRC-based stock exchanges - SHSE and SZSE - will be examined. The Beijing Stock Exchange, which currently has two automated price quotation systems for institutional holders of equity shares of 17 companies, is excluded from this project as this bourse is not substantive. Also, the 17 companies traded on these systems cannot be listed at the SHSE or SZSE (e.g., see Abdel-khalik, Wong and Wu, 1999; Xu and Wang, 1999).

[11] The basic notion of "modern enterprise system" as defined by China's *Companies Law* (1993) is that an enterprise should be an independent legal entity that is responsible for its operating performance and equipped with a governance structure that controls for the separation of ownership from management. To date, only joint-stock companies and LLCs have been installed with such a governance structure; the non-company SOEs have not had such a structure yet at the time this study was carried out. (See also section 2.3.3.1 of Chapter 2).

2. Only publicly listed companies incorporated in mainland China will be examined in this project. Publicly listed companies incorporated in other Chinese territories, namely Hong Kong, Macao and Taiwan, are excluded from this study. This is to avoid the potentially confounding effects that institutional differences (e.g., legal structures) could have on the empirical results (see also footnote 1).

3. As in previous studies (e.g., Xu and Wang, 1999), A-share companies listed at both the SHSE and the SZSE are included in the data set[12]. Gao (1997) and Tian (2001) report that there is no systematic difference between the A-share market indices of the SHSE and the SZSE in terms of market movements. One reason for this observation is that companies listed at the two stock exchanges are likely to be exposed to similar macro-economic and political influences. Thus, the results of this research study are unlikely to be biased by the inclusion of SHSE-listed A-share companies and SZSE-listed A-share companies. However, A-share and B-share markets are segmented and B-share prices are traded at a discount to A-share prices because they are strictly available to different investors (Gao, 1997; Mok and Hui, 1998). Nonetheless, B-share companies (at the SHSE and the SZSE) are included in this study. This is because B-share companies appear to be a potentially important component of publicly listed companies as the Chinese government encourages shareholding enterprises to issue B-shares in order to attract foreign investment (Gao, 1997; Chen, Firth and Kim, 2000) [13]. Additionally, it might be interesting to determine whether the degree of investment by foreign institutions in Chinese publicly listed companies influences corporate property insurance decisions.

4. Compulsory third party liability insurance, companies' statutory social insurance contribution (e.g., to employees' pension) and insurance payments made to

[12] A-shares are exclusively available to domestic investors; B-shares are foreign-owned shares listed at the SHSE and SZSE. H-shares are foreign-owned shares of Chinese companies listed at the Hong Kong Stock Exchange (see also section 2.2.3.2 of Chapter 2).

[13] Currently, B-share companies together represent about 15 percent of the total of publicly listed companies in China (CSRC database (2000)).

captive insurance operations (e.g., China Oil & Chemical group) are excluded from this study[14]. The former two types of insurance are mandated by government regulations, while insurance captives are not normally open-market commercial insurers with whom managers are free to make unrestricted insurance choices (e.g., see Adams and Hillier, 2000). However, collateralized-assets insurance coverage provided under the terms of debt covenants is considered to be within the ambit of this project. In the PRC, although debt-based insurance requirements are not statutorily prescribed, such covenants are increasingly being introduced through negotiation and the mutual agreement of the contracting parties (Li, 1999). Occasionally, companies may also purchase group insurance on behalf of their employees as a benefit-in-kind (e.g., personal injury insurance and house-content insurance) (Wu, 1996). Because this type of purchase is not primarily for the company itself and thus unlikely to correlate closely with firm-specific variables (e.g., assets size), it is excluded from this project.

5. Discretionary liability insurance (e.g., product and directors & officers' liability) is not an economically significant part of total corporate insurance procurement in the PRC (e.g., discretionary liability insurance only represented about 3 percent of the total general insurance premium in 1997) (PBOC, 1998). Furthermore, because of changing legal judgements (long-tail) liability risks are often difficult to ascertain accurately *ex-ante* (Doherty, 1997). Consequently, the levels of liability-based premiums are unlikely to correspond closely with currently measurable firm-specific factors such as the accounting value of total assets (i.e., size). As such, this form of insurance is deemed to be outside the scope of this study. In their US-based study, Hoyt and Khang (2000) also suggest that in addition to liability insurance, business interruption insurance should be excluded because revenue-expense structures vary from firm to firm. This approach is also followed in this study.

[14] Adams and Hillier (2000) report that a captive is a wholly-owned subsidiary insurance company of a non-insurance parent corporation whose primary purpose is to insure or reinsure risks within the group.

6. Property insurance in this study specifically includes insurance coverage of fixed assets (e.g., buildings, plants, equipments and vehicles), current non-financial assets (e.g., inventories) and other physical assets (e.g., office fittings). However, land is excluded from the ambit of this research project because in China it is State-owned and so considered not to be subject to prospective private damage claims. Hence, companies in China do not need, for example, to seek insurance cover for land damage due to pollution.

7. The time span of data in this study covers the three years 1997-99. The year 1997 is the earliest accounting period for which complete and accurate data on PRC-based publicly listed companies were available from public sources at the time this study was carried out. Firm-level insurance premium data, however, have to be collected mainly from each company, as it is often a voluntary disclosure item in the published annual accounts of PRC-based publicly listed companies. To ensure the project is completed in a timely manner, the latest complete year of data used is for 1999.

1.6 OUTLINE OF THE THESIS

This thesis is divided into seven chapters as follows:

Chapter 1: Overview of the Study. This chapter covers the justification for the choice of this research topic, the aim and objectives of the study, the contribution to knowledge, and a description of research methods employed. It also addresses the underlying assumptions and the scope of this study. Finally, an outline of thesis is provided.

Chapter 2: The Chinese Corporate and Insurance Environment. This chapter provides background information about the institutional environment in which both Chinese publicly listed companies and the domestic insurance market operate.

Additionally, the institutional merits of the PRC as a research environment are examined in this chapter.

Chapter 3: Literature Review and Theory Selection. This chapter identifies and reviews critically the various financial economics-based theories and hypotheses which have been advanced in the literature to explain the determinants of the corporate purchase of insurance. The purpose of this chapter is to select an appropriate theoretical framework within which to focus and conduct the empirical component of the study.

Chapter 4: Hypotheses Development. This chapter examines the main propositions of the selected theoretical framework and their implications for explaining the determinants of the purchase of property insurance by Chinese publicly listed companies. From this analysis, a number of testable hypotheses are formulated in order to facilitate empirical testing.

Chapter 5: Research Design. This chapter discusses the rationale for the statistical analysis techniques used in this study. The sources of data, the statistical procedures adopted and the measurement of variables are also described in this part of the thesis.

Chapter 6: Empirical Results and Evaluation. The chapter reports the statistical results derived from the analysis of the sample of Chinese public companies quoted at the SHSE and the SZSE over the period 1997-99, including relevant diagnostic statistics and sensitivity tests.

Chapter 7: Summary and Conclusions. A summary of the main findings and key conclusions regarding the determinants of the discretionary purchase of property insurance by publicly listed companies in the PRC are presented in this chapter. The contribution of this study is assessed and its implications for corporate stakeholders, insurance suppliers and other interested parties are also considered. Moreover, opportunities for future research are identified in this chapter.

CHAPTER 2: THE CHINESE CORPORATE AND INSURANCE ENVIRONMENT

2.1 INTRODUCTION

This chapter provides information on the institutional environment within which PRC-based publicly listed companies and the domestic insurance market operate. Specifically, the chapter examines the current regulatory and legislative framework in China, the features of domestic financial markets, and the key characteristics of publicly listed companies in the PRC. Additionally, the advantages of conducting an empirical study of the determinants of discretionary purchase of property insurance in the PRC's corporate sector are put forward in this chapter.

2.2 INSTITUTIONAL BACKGROUND

2.2.1 Key Features

China, with a population of more than 1.2 billion people and a landmass of 9.6 million square kilometres, has experienced the fastest rate of economic growth in the world over the last two decades (e.g., see Cao, Qian and Weingast, 1999; Dernberger, 1999; Smyth, 1999). Indeed, the national Gross Domestic Product (GDP) reached RMB 7,955 billion (US$ 959 billion) in 1998 thus making China the world's seventh largest economy. Additionally, the PRC has been the second largest recipient of foreign direct investment (FDI) in the world (behind the US) since 1993 (Sun, Tong and Yu, 2002). China's entry into the WTO should also enable the Chinese economy to become more open and closely integrated into the world economic system (Kynge, 2000; Shen, 2000). Not surprisingly, therefore, China as one of the largest and rapidly expanding developing economies in the world has attracted increasing research interest from scholars over the last twenty years (e.g., see Yao and Song, 1998; Cheung and Chow, 1999). Given the country's great commercial potential this academic interest is particularly evident in the field of corporate finance, including risk management (Xu, C.K., 2000).

2.2.2 Economic Reforms

China embarked on market-oriented economic reforms in late 1978 (Cao et al., 1999). The reform process prior to 1984, however, was mainly focused on restructuring the agricultural system (Dernberger, 1999); the emphasis was then shifted to the urban industrial sector (Ma, 1998). However, in contrast to the more radical corporate ownership privatization program followed in Russia and Eastern Europe, China's reform of SOEs has been a gradual and evolutionary process based on the experience of experimentation (e.g., see Qian et al., 1999; Tam, 2000). Until the early 1990s, economic reforms concentrated mainly on the managerial aspects of enterprises (e.g., decentralizing the decision-making process and expanding managerial autonomy in SOEs) without touching on the nature of ownership of SOEs (Huang and Duncan, 1997; Ma, 1998). Thereafter, the Chinese government began to partially privatize SOEs by restructuring them into publicly listed joint-stock companies (Sun and Tong, 2000). The corporatization process of SOEs in the PRC normally involves offering public investors the productive/profitable parts of business units, while leaving the non-productive/unprofitable parts (e.g., hospital and school for employees) either in the original state-owned entity (the parent company) or with local government (Aharony, Li and Wong, 2000). Following corporate restructuring, new shares are then issued to the public through an initial public offer (IPO) (Smyth, 1999; Chen et al., 2000). Publicly listed joint-stock companies are thus likely to become the dominant form of Chinese "modern enterprise system" as the government has decided to adopt the system of shareholdings as the main elements of its reform of large and medium-sized SOEs (e.g., see Ma, 1998; Tam, 2000).

2.2.3 Domestic Financial Markets

2.2.3.1 Debt Markets

The debt financing of PRC-based companies is predominantly facilitated through bank borrowings (Peng, 1999; Tian, 2001). The issue of company debentures is tightly controlled in China as the government sets an annual quota on the volume of total issues. Thus, debentures are not normally available for the majority of Chinese

enterprises (e.g., see Articles of 161-163 of China's *Companies Law* (1993)). In addition, State-owned banks, which are becoming more market oriented, are often cautious in granting loans to companies because of the high risk of financial losses (e.g., see Cao et al., 1999; McGregor, 2000). For instance, it is now common for banks to require sufficient asset collateral and insurance cover as a necessary condition for issuing commercial loans. So far, both the level of savings interest and the benchmark bank lending rate are rigorously controlled by the central bank – the PBOC. Since 1996, however, the PBOC has lowered the interest rate seven consecutive times in order to combat deflation in China. This policy has led to a decline in the cost of corporate borrowings and a concomitant increase in the volume of corporate lending, which has further resulted in an increase in the corporate demand for property insurance on collateralized assets (Peng, 1999).

2.2.3.2 Securities Markets

China's securities markets[15] have in recent years been substantially influenced by the government's efforts to restructure SOEs and transform them into publicly listed joint-stock companies (e.g., see Mills and Cao, 1996; Mok and Hui, 1998; Aharony et al., 2000). Although the first joint-stock company appeared in 1984, formal trading of shares did not start until the two national stock exchanges – the SHSE and the SZSE were established in December 1990 and April 1991, respectively. The total market capitalization of these two markets reached RMB 1,710 billion (US$ 206 billion) at the end of 1997, accounting for approximately 20 percent of the national GDP and roughly 10 percent of the total estimated value of emerging markets' capitalization (International Finance Corporation [IFC], 1998) [16]. Additionally, Lee and Rui (2000) report that in 1997 the combined daily trading volume of China's major two bourses averaged at about 750 million equity deals – slightly less than the estimated 900 million daily average share dealings of the London Stock Exchange over the same period. As at the end of 1999, there were 976

[15] The terms "securities markets", "share markets", "equity markets", and "stock markets" are used interchangeably in this chapter and elsewhere in this thesis.

[16] The total market capitalization in China may be overstated in that some types of equity (e.g., State-held shares) are not publicly tradable (e.g., see Xu and Wang, 1999).

Table 2.1

Summary of PRC-based Publicly Listed Companies by Share Categories

This table describes the numbers of PRC-based publicly listed companies by share types for the period 1997-99.

	Listed in the PRC (the SHSE and SZSE)						Listed outside the PRC		
	Total	Sub-total	A only	B only	A & B	A & H	Sub-total	H only	A & H
1997	787	745	627	25	76	17	42	25	17
1998	876	851	727	26	80	18	43	25	18
1999	976	949	822	26	82	19	46	27	19

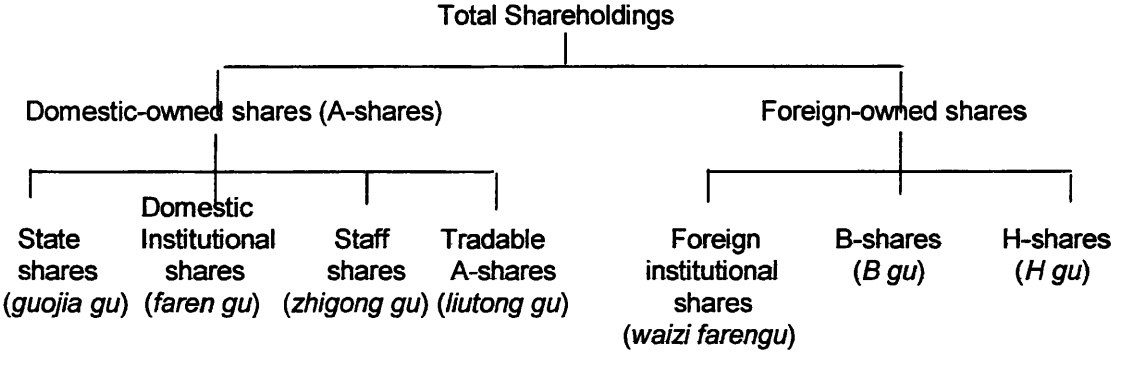
Source: derived from the CSRC database (2000)

Note:
1. A only: companies with A-shares only; B only: companies with B-shares only; H only: companies with H-shares only; A&B: companies with both A-shares and B-shares; A&H: companies with both A-shares and H-shares.
2. The overseas securities markets where Chinese companies are listed include HK (44 companies), New York (eight companies), London (two companies) and Singapore (one company). Because most of overseas listed Chinese companies are traded on the HK Stock Exchange, for simplicity, all the overseas listed Chinese companies are referred to as H-share companies in the official statistics of China Securities Regulatory Committee (CSRC).

Figure 2.1

Categories of Shares in the PRC-based Publicly Listed Companies

This figure illustrates the major categories of shares that are issued by Chinese publicly listed companies - namely, State shares, domestic institutional shares, staff shares, tradable A-shares, foreign institutional shares, B-shares and H-shares.



Source: Derived from various sources (e.g., Mok and Hui, 1998; Xu and Wang, 1999)

publicly listed companies in these two markets with slightly over half of these companies being listed at the SHSE (see Table 2.1).

PRC-based publicly listed companies are typically owned by five groups of shareholders: the State, domestic institutions, private individuals, company staff and foreign investors (see Figure 2.1). The main features of these categories of shares are further described in Table 2.2. The existence of varying levels of State-held shares in PRC-based publicly listed companies is due to the fact that most of them were transformed from former SOEs (Gul, 1999). As illustrated in Table 2.2, tradable A-shares, exclusively designated for domestic investors, are the only type of equity traded among domestic investors at the two stock exchanges in mainland China. It has been argued by some commentators (e.g., see Li and Deng, 1999; Xu and Wang, 1999) that staff-held shares are designed more as an employee benefit-in-kind rather than as an incentive device. Furthermore, the local currency (Renminbi) is not officially convertible; therefore while B-share prices are denominated in Renminbi, transactions are settled in US dollars at the SHSE and HK dollars at the SZSE. As the Figure 2.2 makes clear, most Chinese publicly listed companies are concentrated in the manufacturing and service (e.g., retail) sectors of the economy. These two sectors together account for approximately 80 percent of the total number of publicly listed companies in the PRC. Geographically, most Chinese publicly listed companies are located in the Eastern Coastal region (62 percent), followed by the Central region (20 percent) and the Western region (18 percent) (CSRC database (2000))[17]. In other words, the numbers of publicly listed companies in China appear to be closely related to the degree of regional economic development.

As noted in Chapter 1, tradable A-share markets and B-share markets in the PRC are segmented and they are strictly restricted to different investors so that arbitrage opportunities are likely to be limited (e.g., see Fleisher and Su, 1998; Mok

[17] The Eastern Coastal region includes three autonomous cities (Beijing, Shanghai, Tianjin) and nine provinces (Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi and Hainan). The Central region comprises the provinces of Shanxi, Inter Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan. The Western area consists of Sichuan, Guizhou, Yunnan, Shanxi, Gansu, Qinghai, Ningxia and Xinjiang. Generally speaking, the level of economic development is highest in the Coastal region due to the regional orientation of China's economic reform policies as well as its geographical advantages such as good economic infrastructure (e.g., see Sun, Hone, and Doucouliagos, 1999).

Table 2.2

Features of Different Types of Shares in PRC-based Publicly Listed Companies

This table describes the main features of each category of shares that are issued by Chinese publicly listed companies.

Share types	Shareholders	Tradability
State shares	Various government departments or their delegated bodies (e.g., Bureau of State Assets Management (BSAM) and state assets investing companies).	Not publicly tradable, but may be transferred to domestic institutions upon the approval of the Ministry of Finance and the CSRC (Article 94 of China's *Securities Law* (1998))
Domestic Institutional shares[1]	Corporate investors such as SOEs, non-State-owned companies, financial institutions (other than commercial banks)	Not publicly tradable (but may be sold to other domestic institutions by negotiation outside the stock exchanges upon approval). Sales of institutional shares to foreign investors were suspended in May 1996 in order to avoid foreign investors' dominance over the domestic companies.
Tradable A-shares[2]	Mainly private individuals (and some domestic institutions and securities investment funds)	Publicly tradable at the SHSE and the SZSE
Staff shares[3]	Company employees and managers.	Initially prohibited from trading for one year after allocation, and thereafter, may become tradable A-shares upon approval from the CSRC. Shares held by the senior management of listed companies may not be sold during their term of office with the company (Article 174 of China's *Companies Law* (1993)).
B-shares	Exclusively foreign investors (typically financial institutions)	Publicly tradable at the SHSE and the SZSE
H-shares (N-shares, S-shares)	Exclusively foreign investors	Publicly traded at overseas stock exchanges of Hong Kong (H-shares), New York (N-shares), Singapore (S-shares) and so on.
Foreign institutional shares	Foreign investors (these are institutional shares procured as founder shares or private placement shares)	Not publicly tradable (founder shares are not allowed to transfer within three years subsequent to the incorporation of company (Article 147 of the Chinese *Companies Law* (1993))

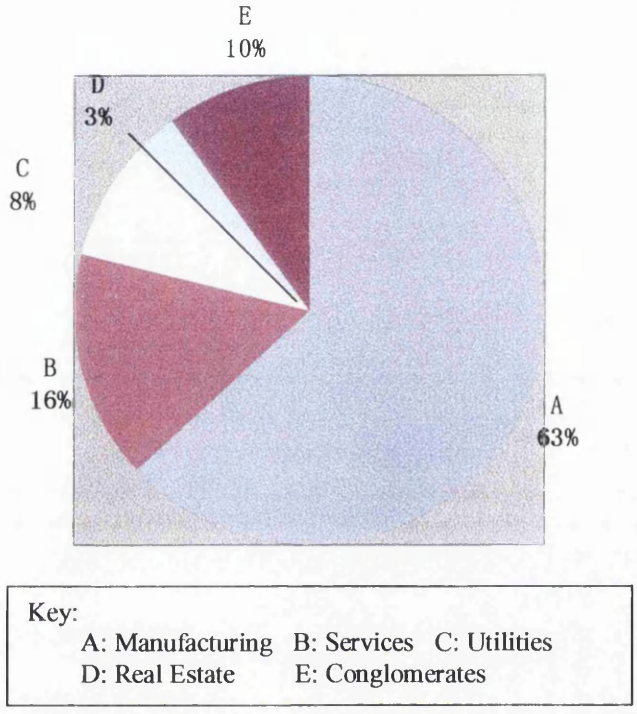
Source: Derived from various sources (e.g., Mok and Hui, 1998; Xu and Wang, 1999)

Notes:
1. Article 43 of China's *Commercial Bank Law* (1995) forbids commercial banks to hold company shares directly.
2. Tradable A-shares must represent more than 25% of the total shares in issue (Article 156 of China's *Companies Law* (1993)).
3. Issued only at the time of initial public offering.

Figure 2.2

PRC-based Publicly Listed Companies Categorized by Industry Sectors

This figure illustrates the classification of Chinese publicly listed companies by industrial sectors.



Source: CSRC database (2000)

and Hui, 1998; Poon, Firth and Fung, 1998). As a result, the prices of tradable A-shares and B-shares can differ dramatically – with companies' B-share prices often trading at a discount relative to their A-shares despite the same voting power and rights represented by both types of shareholdings (e.g., both shares receive the same dividends, albeit in a different currency) (Chen et al., 2000)[18]. Additionally, A-share markets are often highly volatile because tradable A-shareholders (mainly private individuals) seem to be speculators seeking short-term trading profit. In contrast, B-shareholders (typically foreign financial institutions) tend to be medium to long-term

[18] Sun and Tong (2000) find that the existence of the H-share and the "red-chip" markets in HK (i.e., HK incorporated and listed companies which are majority Chinese-owned) provide good substitutes for the B-share market because HK stock market seems to be more liquid and transparent. This provides another explanation for the significant discount of B-share prices relative to A-shares.

investors (i.e., typically with investment horizons of three years or more) with different risk-return utility preferences from short-term investors/speculators (Gao, 1997)[19]. Therefore, the risk management (and thus insurance) practices of Chinese publicly listed companies could reflect risk preference differences emanating from variations in their ownership structure.

2.2.3.3 Insurance Markets

Commercial insurance business in the PRC had been suspended between 1958 and 1979 as under the Maoist centrally planned economy insurance was deemed to be replaceable by State finance and so redundant (Niu, 1995). In 1980, however, the Chinese government resumed commercial insurance practices in order to support the process of economic reform (Ma et al., 1998). Since then, the Chinese insurance market has experienced an exponential growth in the demand for insurance with real premium growth rate exceeding 30 percent per annum (Ma et al., 1998). In 1999, the size of Chinese insurance market in terms of aggregate annual insurance premiums written was RMB 139 billion (US$ 16.8 billion), with general insurance accounting for about 37 percent of the total. At the same time, the total number of insurance suppliers increased from a single monopoly insurer in 1980 (i.e., the State-owned People's Insurance Company of China (PICC)), to 29 as at the end of 1999 (Xu, N., 2000). Currently, the PICC, China Pingan Insurance Company and China Pacific Insurance Company are the top three composite insurance suppliers in the PRC in terms of their market share of written premium income – amounting to 63 percent, 16 percent and 9 percent, respectively (Wei et al., 1999) [20]. Industry market commentators (e.g., see Chen, 1998; A.M. Best, 1999; Shen, 2000) argue that the Chinese insurance market has the potential for even greater growth and development. For example, the insurance density (i.e., premium per capita) of China in 1998 was only US$ 12 (ranking 78th in the world); while the degree of insurance penetration

[19] The reason why B-shares are normally held by institutional investors is that B-shares are usually issued through private placements (Gao, 1997; Mok and Hui, 1998).

[20] The Chinese *Insurance Law* (1995) requires the separation of life insurance operation from general insurance operation (Article 91). Thus, in 1996, the PICC was split into three separate companies, i.e., China Life, China Insurance and China Reinsurance. The other two composite insurers – China Pingan Insurance Company and China Pacific Insurance Company - are also disaggregating their life and general insurance business.

(i.e., annual written premiums as a percentage of GDP) was less than 2 percent, lagging far behind the average level of 4 percent in other developing countries (e.g., Thailand) and 7 percent in more established insurance markets (e.g., the UK) (PBOC, 1999)[21]. China's emerging insurance market has also attracted inward investment from foreign insurance companies. Indeed, by the end of 1998, 113 foreign insurance companies from 17 countries had set up 202 representative offices in China in attempt to obtain a licence to transact insurance business (Wei et al., 1999). As at the end of 1999, eight of these foreign insurers (including the UK's Royal Sun Alliance company) had been granted a licence to open a branch office and operate general insurance business, while eight multinational insurers (e.g., Canada's Manulife) had been approved to form life insurance joint-ventures with Chinese business partners.

For economic and political reasons (e.g., the comprehensive job security and welfare rights afforded to employees under the old planned economy), general insurance has been the dominant sector of the insurance market in the PRC prior to 1997 in terms of the volume of annual generated premium income. Indeed, as mentioned earlier in section 1.1.2, corporate property insurance is currently by far the largest class of general insurance business in China with generated premiums accounting for over 70 percent of the non-motor general insurance market (Xu, N., 2000). This indicates that corporations are important purchasers of property insurance in the PRC. At present, there are 14 general insurance suppliers (including eight foreign insurers) in China, offering more than 300 types of commercial products, ranging from property to liability insurance coverage (Wei et al., 1999). This degree of insurance supply enables managers of Chinese companies to have considerable choices of insurance products that are best suited to their needs. Liability insurance, in contrast, only contributed approximately 3 percent of total underwritten insurance premium in 1999 and thus represents only a small amount of corporate insurance procurement in the PRC.

In view of the foregoing it is not surprising that many industry commentators (e.g., Ma et al., 1998; A.M. Best, 1999; Shen, 2000) forecast that the corporate demand for insurance in the PRC will continue to increase in line with the country's

[21] The terms - insurance density and penetration - are often used to measure the degree of maturity of insurance markets and their potential for future growth (Falush, 1996).

rapidly expanding rate of inward investment and developing economic infrastructure. Indeed, investors (particularly foreign investors) are likely to be reluctant to commit funds to promising, but uncertain, emerging market-based projects without adequate insurance cover (e.g., see Beamish, 1993; Child and Markoczy, 1993; Falush, 1996). Furthermore, it is expected that future growth in corporate insurance procurement will emanate from the ongoing market reform of SOEs in the PRC and enhanced managerial awareness of business risk management (e.g., see Ma et al., 1998; Shen, 2000; Xu, N., 2000).

2.3 REGULATORY FRAMEWORK

2.3.1 Regulation of Securities Markets

The CSRC is the regulatory authority for securities markets in the PRC. Cross-listing between the SHSE and the SZSE is not allowed in China – thus a company can either apply to be listed at the SHSE or the SZSE, but not both markets concomitantly (Lee and Rui, 2000). Until 2000, China adopted a quota allocation system by setting an annual limit on new share issues (Aharony et al., 2000). Thus, if an enterprise wished to apply for IPO it must go through a rigorous and lengthy approval process covering such matters as the adequacy of business plans, managerial expertise and financial condition, amongst other things. This means that only a handful of applicants are likely to be approved to make an IPO, thus making corporate listing qualifications relatively rare events (Aharony et al., 2000). Consequently, many unlisted companies in the PRC may wish to gain access to the securities markets indirectly by acquiring a "shell company" rather than through a direct IPO (Chi and Ma, 2000)[22]. This factor, together with the absence of an enforceable bankruptcy law and the government's concern over social stability, means that the authorities are often reluctant to delist or liquidate a poorly performing company (Xu

[22] The term "shell company" in the PRC refers to those listed companies that are financially poorly performing and therefore disqualify themselves in raising additional financing from the stock market (Chi and Ma, 2000). According to the CSRC's requirements, in order to be entitled to raise additional capital after IPO, a publicly listed company must report a return of no less than ten percent on equity for three consecutive years (*Provisional Ordinance on the Issue and Trade of Shares*, 1993).

and Wang, 1999)[23]. Not surprisingly, for those financially poorly performing companies, local government often tries all means to rescue them through providing financial subsidies and/or coordinating asset reorganizations (Chi and Ma, 2000). Consequently, until 2000, no companies had been delisted permanently in the PRC. Companies that experienced material asset reorganizations during the research period (1997-99) may result in the problem of incomparable time-series data, thereby affecting the results of the present study. This potential problem will, however, be dealt with in the process of sample selection (see Chapter 5, section 5.3).

2.3.2 Insurance Regulation

Prior to November 1998, the insurance industry in China was regulated by the PBOC; thereafter, the industry has been administered by the China Insurance Regulatory Commission (CIRC). The *Insurance Law* (1995) is the first statute in the PRC that sets forth the basic principles of transacting commercial insurance and thus it acts as the "mother law" for other insurance related rule-making.

Property insurance prices in the PRC have long been tightly controlled compared with that of many established insurance markets (e.g., UK) (Wu, 1996; Shen, 2000; Wang, 2000). The important laws relating to property insurance pricing are the *Nationwide Insurance Clauses and Premium Rates* (1993), the *Insurance Law* (1995), the *Provisional Ordinance on Insurance Administration* (1996) and the *Clauses, Premium Rates of Property Basic Risks Covers and Property Comprehensive Risks Covers* (1996). Under these regulations, rates of insurance premium and basic contract terms for the majority of corporate insurance products are controlled by the CIRC (Shen, 2000). Only a limited fluctuation in premium rates (up to a maximum 30 percent) is allowed on intra-provincial business with the CIRC approval. Additionally, the risk rating practice of insurance companies is also unified by the *Clauses, Premium Rates of Property Basic Risks Covers and Property Comprehensive Risks Covers* (1996). This document contains guidelines covering the classification of insurable hazards and the scaling of industrial risks. Furthermore, the *Insurance Law*

[23] The existing *Bankruptcy Law* (1986) in the PRC only applies to wholly State-owned industrial enterprises. Gao and Yao (1999) report that this law has proven to be difficult to enforce as economic reform has meant that an all-embracing social security system no longer exists in China.

(1995) forbids insurers to compete by granting their customers premium rebates (Article 106). PRC-based insurers are also restricted (Article 101) in their ability to transfer assumed risks to the international reinsurance market (e.g., they have to give preference to PRC-based insurers/reinsurers) (Shen, 2000). The above-mentioned laws and regulations were in effect over the three-year period (1997-99) covered by the empirical component of this study (with no additional legislation and/or regulation affecting property insurance prices being enacted during this period). Consequently, property insurance prices in the Chinese market have been fairly stable in recent years thereby avoiding the possibility of premium level distortions due to extraneous environmental (e.g., regulatory) effects.

2.3.3 Corporate Regulation

2.3.3.1 Companies Law (1993)

China's *Companies Law* (1993) sets out the general requirements on company incorporation. The 1993 Law includes, amongst other things, matters such as corporate governance, the issue, listing and trading of shares, corporate accounting and reporting, dissolution and liquidation. The 1993 law further divides PRC-based companies into LLCs and joint-stock companies according to the number of shareholders and the divisionability of equity capital. The former are only allowed to have up to 50 shareholders and their equity capital cannot be divided into equal shares (Article 3). On the other hand, a joint-stock company can be incorporated through a combination of sponsor subscriptions and an IPO (termed *faqi sheli*)(Article 74). However, sponsors must subscribe no less than 35 percent of the total shares in issue and the proportion of shares for an IPO must be greater than 25 percent of total shares in issue (Articles 83 and 152). The *Companies Law* (1993) also mandates a corporate governance structure for companies incorporated in the PRC (see section 2.4.2). A joint-stock company applying for listing status must also report annual operating profits for each of the previous three years (Article 152). Publicly listed companies must further produce interim (six monthly) and audited annual financial statements and publish them in the public domain (Articles 156 and 175). Under the legislation, a Chinese company can also be delisted temporarily for a "period of improvement" if it

has been loss making over all the previous three years, and delisted permanently, if that losses persist upon the expiry of the improvement period agreed previously with the CSRC (Article 157).

2.3.3.2 Securities Law (1998)

Amongst other things, China's *Securities Law* (1998) dictates the procedures for share issuance, share transactions, information disclosure requirements of publicly listed companies, and the rules of corporate takeover. For instance, consistent with the *Companies Law* (1993), publicly listed companies are required to publish regular reports at least twice a year (i.e., the interim and annual reports). The annual report should incorporate a profile of the company, its audited annual financial statements (i.e., balance sheet, profit and loss account and cash flow statement), business review, senior management profile, and the number of outstanding shares and bonds (including the top ten shareholders and their respective holdings). Listed companies in the PRC are also required to publicly prepare occasional reports giving details of expected "material incidents" that may substantially affect their share prices. For example, the 1998 *Securities Law* regards the write-off and/or disposal of more than 30 percent of company's operating assets as "material incidents". Corporate takeover can take two forms – bidding purchase *(yaoyue shougou)* or a negotiation purchase (*xieyi shogou*). The former involves buying shares through stock exchanges; the latter is conducted in negotiation with the shareholders of the acquired company outside of the stock exchanges. Such arrangements should be approved by the CSRC and the Ministry of Finance if State-held shares are involved. The five percent of shareholding is the "cutting point" adopted by the 1998 Law to distinguish between large and small shareholders (Article 68). Therefore, investors need to report to the CSRC and the stock exchange authorities once they hold five percent of the total shares in issue of a publicly listed company through the stock exchanges and any five percent change onward.

2.3.3.3 Accounting and Financial Reporting Requirements

Currently, business accounting rules in the PRC consist of *Accounting Standards for Business Entities* (ASBE) and 13 industry-specific accounting

promulgations. These were introduced in 1993 and effectively constitute local generally accepted accounting practice (Chinese GAAP) (Lin and Chen, 1999; Xiao, 1999). In addition to the ASBE, publicly listed companies in China are required to comply with the *Accounting System for Joint-stock Companies* (1993) which is more conservative and thus much closer in format and content to international accounting standards (IAS). For financial disclosure, publicly listed companies have to abide by a standard format of annual disclosure as contained in the CSRC's *Contents and Formats of Annual Report for Joint-stock Companies* (1997-99). This format is also subject to annual review and improvement by the CSRC. Consequently, the nature and amount of information disclosure by publicly listed companies in their annual report and accounts over the last three years have become more detailed and transparent than was hitherto the case (Xiao, 1999).

There are some notable differences in accounting and financial reporting between A-share companies and companies with foreign investors (typically B-share companies and H-share companies, as referred to "foreign-invested companies" hereafter) (e.g., see Mok and Hui, 1998; Chen et al., 2000). For example, the latter should prepare two sets of financial statements in accordance with IAS (for foreign investors) and Chinese accounting standards (for domestic investors), respectively. Additionally, foreign-invested corporations normally employ international accounting firms (e.g., PriceWaterhouse Coopers) as auditors (Defond et al., 2000). Moreover, Mills and Cao (1996) and Mok and Hui (1998) report that there are more requirements on information disclosure for foreign-invested companies than A-share companies. For instance, in addition to the *Contents and Formats of Annual Report for Joint-stock Companies* (1997-99), H-share companies need to comply with the information disclosure requirements of Hong Kong Stock Exchange (HKSE).

2.3.3.4 Corporation Tax

China's tax reform in 1994, among other features, unifies the income taxation rate for non-foreign invested enterprises at nominally 33 percent of taxable income (Perotti, Sun and Zou, 1999). It also prescribes tax-deductible items (e.g., insurance premiums paid and losses incurred). Additionally, the Chinese income taxation law allows the operating losses of current year to be made up by the pre-tax operating

profits of next five years. In respect of the important roles played by publicly listed companies in the local economy and as a preferential tax policy, local government has discretion to partially exempt the income tax burden of publicly listed companies (e.g., through tax rebates). As Wang (1999) reports, this practice seems to bring the average rate of income tax of the majority of publicly listed companies down to about 15 percent of taxable annual profits. As a way to attract overseas investment, foreign-invested companies also normally enjoy various forms of tax preferential treatment. For example, in the first two operating years, newly founded foreign-invested companies can obtain a full tax exemption and a 50-percent exemption in the following three operating years.

The tax-induced explanation for corporate hedging holds that hedging can reduce the expected tax liability for a firm facing a convex effective tax schedule by reducing the volatility of the firm's expected taxable income stream (e.g., see Mayers and Smith, 1982; Main, 1983; Smith and Stulz, 1985). The convexity of effective tax schedule often results from both the statutory progressivity (e.g., in the US) and the presence of tax preferential items (e.g., tax-loss carry-forwards and investment tax credits) (e.g., see Nance et al., 1993; Mian, 1996). The existence of operating loss carry-forwards and some other tax concessions could introduce modest convexity in some Chinese firms' tax position, which could potentially affect the insurance decisions of Chinese managers. This possibility is examined further and controlled for in the model development section of this thesis (see section 4.4.5).

2.4 SALIENT FEATURES OF CHINESE PUBLICLY LISTED COMPANIES

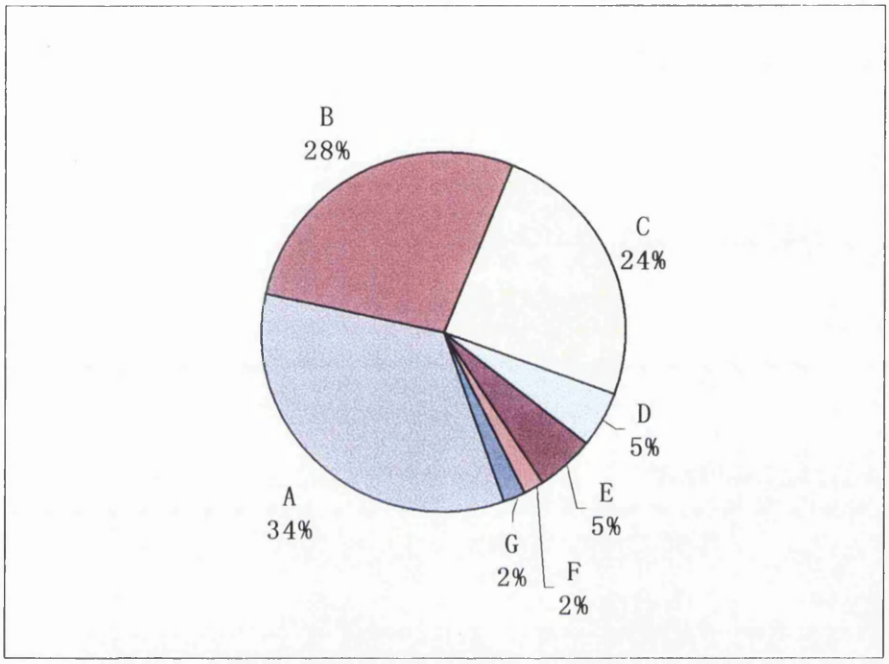
2.4.1 Ownership Structure

Most publicly listed Chinese companies have a mixed form of ownership structure (see Figure 2.3). Specifically, the State, domestic institutional investors and indigenous private individuals are the three dominant groups of shareholders. However, only about one-third of shares in issue are traded at the SHSE and the SZSE. As at the end of 1998, the State held stakes in more than 90 percent of publicly

Figure 2.3

The Average Ownership Structure of PRC-based Publicly Listed Companies (1998)

This figure describes the component of the ownership structure of a typical Chinese publicly listed company, including the categories of shares and their approximate proportions of total shareholdings.



Source: CSRC database (2000)

listed companies, retaining a controlling interest in about half of these entities (e.g., see Cheng, Zheng and Huang, 2000). A recent trend in the change of ownership structure is that the proportion of State-held shares is falling gradually in contrast to the slow rise in the fraction of tradable A-shares and institutional investor-owned shares. This is because the government often does not have the resources to exercise rights offerings and some State-held shareholdings have in recent years been sold out (Ma, 1998; Xu and Wang, 1999). Also, the average proportion of government-owned shares has declined from 51 percent in 1992 down to 34 percent at the end of 1998 suggesting a gradual privatization of Chinese publicly listed companies (Yuan and Wang, 1999). However, the ownership of publicly listed companies in the PRC is still highly concentrated (among the State and institutional shareholders) compared with the US and Japanese corporations (e.g., see Xu and Wang, 1999; Chen et al., 2000;

Tian, 2001). For instance, as at the end of 1998, the main, the largest three and five shareholders in the PRC-based publicly listed companies held 45 percent, 57 percent and 60 percent of the total shares in issue, respectively. This suggests that many PRC-based publicly listed companies are dominated by one or two large State/institutional shareholders. The closely-held nature of share ownership in the PRC and the concomitant concentrated business risk for owners could thus encourage managerial spending on property insurance to mitigate the systematic and unsystematic risks of investment (see Chapter 4, section 4.4.1).

2.4.2 Corporate Governance Structure

Since 1993, the Chinese government has made the establishment of a "modern enterprise system" the key focus of its SOE reform programme (Ma, 1998). The Anglo-American-type corporate governance model, as contained in China's *Companies Law* (1993), has also been installed in PRC-based publicly listed companies (Tam, 2000)[24]. Under this fabric, the annual general meeting of shareholders is the forum at which the board of directors (including the board chairman) and the supervisory board are appointed (Article 103 of China's *Companies Law* (1993)). Under Article 112 of the 1993 Law, the board of directors represents the interests of shareholders and has the right to make important corporate decisions such as the approval of investment plans, the appointment of management and the determination of managerial remuneration. Thus, the board of directors plays an important part in the corporate governance process of PRC-based publicly listed companies. Indeed, Xu and Wang (1999) argue that both the State and institutional investors rely heavily on the board of directors acting in a prudent and responsible manner. Many prior studies (e.g., see He, 1998; Li and Deng, 1999; Xu and Wang, 1999) also show that the board of directors in Chinese publicly listed companies is often dominated by large shareholders' representatives and/or (internal) executive directors[25]. Additionally, insider directorship normally accounts for over 40 percent of

[24] The term "Anglo-American" model of corporate governance refers to the arrangements usually found in the English-speaking mature market economies such as the US, the UK, Australia and Canada (Mayer, 1994; Tam, 2000).

[25] In this study, executive directors (or internal directors) refer to managerial board members, while external directors refer to those directors who are independent of both the company and its shareholders.

the board membership; in contrast, prior studies report that the proportion of non-executive external directors is typically less than 10 percent of the membership[26].

Another corporate governance feature provided by the 1993 Law (Article 124) is the appointment of a supervisory board, consisting of representatives of shareholders and employees. This body is empowered to monitor the economic behavior of company directors and managers. Ma (1998) and Li and Deng (1999) argue that as shareholder and employee representatives tend not to be independent of board directors and management, they frequently fail to discharge their duties in an independent and objective manner. Although company managers should be appointed by the board of directors, their appointment, particularly in publicly listed companies where the State remains as the majority shareholder, is often subject to government intervention (e.g., see Chi, 1999; Willhelm, 1999; Wu, G.S., 2000). In contrast, those publicly listed companies controlled by institutional shareholders tend to operate with less government interference. For instance, large institutional shareholders can nominate board members and choose managers at their will (Xu and Wang, 1999). Moreover, chief executive officer (CEO) duality (i.e., where the same person serves as both the board chairman and the CEO) is reported to be common to almost one-third of PRC-based publicly listed companies (e.g., see He, 1998; Wu, Bai and Xi, 1999; Li and Deng, 1999).

Prior studies also report that managers in many PRC-based listed companies either do not own company shares or their shareholdings are very minor (with each person normally holding less than 0.01 percent of total shares in issue) (e.g., see Li, 2000; Qi, Wu and Zhang, 2000; Sun, Tong and Tong, 2002). Some authors (e.g., see Li and Deng, 1999; Xu and Wang, 1999; Wei, 2000) also note that traditionally the allocation of shares to managers, where it existed, was introduced mainly as an employee benefit-in-kind rather than a specially designed incentive scheme (as, for example, with share option schemes in the US and UK corporations). In most

[26] The term "inside directors", as used in this project, is defined as company managers and executive directors. Also, the term of "insider control" in this study refers to the phenomenon that insiders may exercise control over the corporate governance process but not act in the interests of shareholders. This is different from the term that is often used in the analysis of the privatization of firms in Russia and former socialist countries in Eastern Europe. In those studies, the term refers to the capture of majority ownership by the incumbent directors, managers and workers in the company (e.g., see Wu, L.J., 2000).

instances, staff shares are allocated at the time of the IPO rather than as an annual reward for improved financial performance (Li and Deng, 1999; Xu and Wang, 1999). Wei (2000) also finds that in about 30 percent of Chinese publicly listed companies, the CEO and the board chairman are non-remunerative, as these positions are frequently held by government officials and/or representatives of the parent company on a part-time basis[27].

In view of the substantial insider directorship, the ill-functioned supervisory board and the lack of compensation incentive structures, agency problems between managers and shareholders/debtholders could be severe in Chinese publicly listed companies. This therefore could have important implications for corporate risk management policies. For instance, it could be interesting (e.g., from a public policymaking stand point) to examine the role played by company managers in corporate insurance decisions – either to deliver welfare gains for shareholders and/or to serve their own interest. These issues are examined and empirically tested in Chapters 4-6 of this thesis.

2.5 MERITS OF THE RESEARCH ENVIRONMENT

The forgoing institutional analysis indicates that the PRC is a large economy with growing financial markets and rapidly developing legislative and regulatory infrastructures. As several commentators (e.g., Shen, 2000) acknowledge, insurance will undoubtedly play a major role in the future development and growth of the Chinese corporate sector, particularly in alleviating financial uncertainty and enhancing risk management. More specifically, however, China is considered to be an interesting environment within which to conduct this study in four important regards as follows:

1. Ostensibly, insurance could be more important to the PRC-based corporations than to companies operating from more developed countries. For instance, as

[27] In October 1998, the CSRC issued a rule to require the separation of the management of listed companies from that of their parent companies. Thus, it is expected that the number of "dual positions" in PRC-based publicly listed companies will decrease over the next few years.

noted in section 2.4.1, it is not common for Chinese investors to hold well-diversified portfolios of investments as share ownership tends to be heavily concentrated in most PRC-based publicly listed companies. Additionally, shares held by the State and institutions are not publicly tradable (e.g., see Xu and Wang, 1999; Chen et al., 2000). Furthermore, as Tian (2001) notes, most Chinese publicly listed companies tend not to be sufficiently large (in terms of their total asset size) to self-retain insurable risks effectively and few of them can diversify their businesses geographically (e.g., most Chinese enterprises only operate in one business location - see Hussain and Zhuang, 1997). These observations thus underscore the need for Chinese companies to use property insurance to manage their asset-loss risk.

2. As noted earlier in section 2.3.2, as a result of regulatory control over property insurance premium rates and insurers' underwriting practice, property insurers operating in the PRC do not have much scope to vary policy contract conditions in order to protect themselves effectively against information asymmetries (between themselves and insureds). This inability of PRC-based insurers to charge risk-commensurate premium rates implies that, *prima facie*, high-risk companies are unlikely to be seriously deterred from purchasing property insurance[28]. This feature thus provides us with an unique opportunity to investigate differences in the insurance behavior of both low- and high-risk Chinese corporation.

3. As mentioned previously in section 2.3.2, property insurance prices are tightly regulated in the PRC, but the insurance purchase decisions of managers *per se* are not regulated (e.g., see Wu, 1996; Shen, 2000; Wang, 2000). In China, all insurance underwriters have to comply with the benchmark premium rates and the risk-rating rules set by the insurance regulatory authority. Only a limited range of premium-rate fluctuation is allowed by the insurance industry regulator to reflect short-term changes in market conditions. In addition, there were neither legislative changes nor regulatory alterations that could have

[28] However, managers in high (physical asset loss) risk companies will have the choice to adopt alternative risk management solutions to commercial insurance (e.g., self-insurance) if the premium rate offered in the market is deemed to be greater than the expected value of prospective losses.

substantially affected property insurance premium rates over the period 1997-99. Therefore, insurance premium rates in the PRC are expected to be influenced less by competitive market forces and differences in the risk-rating practices of underwriters than might be the case in some more developed countries (e.g., the UK). As a result, variations in the corporate spending on property insurance incurred by PRC-based publicly listed companies are more likely to reflect the changes in managerial discretion over insurance decisions rather than the confounding changes in insurance companies' underwriting practices and/or sharp movements in market prices. In other words, in China, annual total insurance premiums will primarily vary because of firm-specific differences in the volume of coverage[29]. It is considered that this feature constitutes an important institutional advantage for this project as it enables more robust test of the hypotheses derived in this thesis (Chapter 4) to be carried out.

4. As noted earlier in section 2.3.3.3, PRC-based publicly listed companies are required to comply with uniform and mandatory accounting practices (i.e., *Accounting System for Joint-stock Companies* (1993)) and financial information disclosure formats (i.e., *Contents and Formats of Annual Reports for Joint-stock Companies* (1997-99) (Lin and Chen, 1999; Xiao, 1999). Consequently, the research results reported in this thesis (Chapter 6) are unlikely to be adversely affected by major differences in accounting treatments and financial reporting practices among companies. Additionally, published data on PRC-based publicly listed companies should enable potentially interesting empirical tests of hypotheses to be carried out. For instance, the mix of the State, private and foreign ownership structures in the Chinese corporate sector could influence the extent to which companies are subject to the risk of financial distress. The desire to manage solvency risk could thus influence the corporate decision to purchase property insurance in the PRC.

[29] To some degree, the level of annual premiums paid by Chinese companies may also vary because of differences in expected claims costs arising from (omitted) firm-specific effects (e.g., in terms of potential adverse selection/moral hazard problems). However, using a fixed-effects panel design that allows the intercept to vary cross-sectionally, I am able to capture the potential influence of omitted variables (see section 5.5.4.2).

2.6 CONCLUSION AND SUMMARY

This chapter provides background information on the institutional environment within which this study is conducted and the salient traits of PRC-based publicly listed companies. Additionally, the chapter considers that the PRC provides a unique and interesting environment within which to study the determinants of corporate demand for property insurance. For example, the tightly controlled and generally stable property insurance pricing over the period 1997-99 means that corporate insurance spending could reflect on closely the managerial discretion over insurance decisions rather than the influence of external market conditions. It is considered that these attributes will enable a cleaner and more robust test of the research hypotheses to be carried out. The various theories and hypotheses that could help to identify the determinants of corporate purchase of property insurance are reviewed in the next chapter of this thesis.

CHAPTER 3: LITERATURE REVIEW AND THEORY SELECTION

3.1 INTRODUCTION

The extant academic literature contains several positive-descriptive theories and hypotheses that could usefully explain and predict the corporate purchase of insurance. The objectives of this chapter are two-fold. First, the chapter introduces the key features and main merits/criticisms of positive-descriptive theories. Second, the chapter reviews critically the relevant positive-descriptive literature in order to determine an appropriate theoretical framework within which the empirical part of this study can be carried out. The literature review encompasses the following theoretical frameworks.

(1) Expected-Utility Theory.
(2) Contingency Theory.
(3) Market Signalling Theory.
(4) Option Pricing Theory.
(5) Stakeholder Theory.
(6) Transaction Cost Economics.
(7) Agency Theory.

Table 3.1 summarizes the above-mentioned theories and hypotheses employed in the literature, together with their important characteristics. The extent to which each of these theories and hypotheses provides a tenable framework for the study of the determinants of the corporate purchase of property insurance is examined in sections 3.3.1 to 3.3.7 below.

Table 3.1

A Summary of Theories and Hypotheses Used in Prior Insurance Studies

This table summarizes the important features of the major strands of theories and hypotheses that have been used in prior studies to explain the corporate purchase of insurance.

Theory	Proponents (Example)	Main Aspects	Key Assumptions	Rationale for Insurance
• Expected-Utility Theory	· Mossin (1968) · Schlesinger (1981)	· Utility maximization · Risk aversion	· Positive marginal utility	· To reduce risk of shareholders and/or managers
• Contingency Theory	· Ashby and Diacon (1998) · Donaldson (2001)	· Environmental factors (e.g., competition) · Organizational factors (e.g., size)	· Managerial perceptions determine corporate behavior · Direct cause-effect relations exist	· To respond to environmental and organizational needs
• Market Signalling Theory	· Doherty (2000a) · Grace and Rebello (1993)	· Proprietary costs · Market benefits	· Information asymmetries between contracting parties	· To signal managerial ability · To signal the true firm value
• Option Pricing Theory	· Doherty (2000b) · Hsieh, Chen & Ferris (1994)	· Pricing of contingent claims · Default put option of owners	· Efficient markets	· To lower the value of the default put option and reduce the cost of debt capital
• Stakeholder Theory	· Cornell and Shapiro (1987) · Grillet (1992b, 1993)	· Explicit and implicit claims · Net organizational capital	· Rational behavior by stakeholders · Implicit claims matter	· To hedge the risk of implicit claimants and increase net organizational capital
• Transaction Cost Economics Theory	· Bjuggren (1995) · Grillet (1992a, 1993)	· Governance structures affect transactions costs	· Bounded rationality · Opportunism	· A "make or buy" decision · Induced by asset specificity · Economizing hedging costs
• Agency Theory	· Mayers and Smith (1982) · Smith (1986)	· Incentive conflicts between contracting groups · Conflict control through insurance	· Unlimited rationality · Utility maximizing · Self-interest behavior of contracting parties	· Monitoring role of insurers · Bonding role of insurance · Reducing residual loss

Source: Derived from the academic literature

3.2 POSITIVE-DESCRIPTIVE THEORIES

3.2.1 Key Features

There are two distinct types of economic theories - normative-prescriptive and positive-descriptive (e.g., see Jensen, 1983; Keita, 1997). The former utilizes researchers' value judgments (either explicitly or implicitly) to generate prescriptions of the best practice on "what ought to be". In contrast, the latter adopts an objective (i.e., "value-free") view to describe, explain and predict economic activities such as financial management behavior (e.g., see Leftwich, 1979; Watts and Zimmerman, 1990; Walton, 1991). In view of their different nature, researchers have suggested that normative-prescriptive and positive-descriptive theories should be investigated through the use of different research methods (e.g., see Mayers and Smith, 1981; Lipsey, 1989; Keita, 1997). For example, positive-descriptive prepositions can normally be confirmed/refuted by means of observation and/or empirical testing. Normative-prescriptive theories, however, are often interpreted using personal value judgments of observed phenomena (e.g., see Keita, 1997). Owing its philosophical and methodological allegiance to positivism, contemporary neoclassical economics that began to flourish in the 1950s is viewed by scholars to attain a cognitive status that qualifies itself "scientific" (e.g., see Keita, 1997). Since the mid-1950s, positive-descriptive research questions have also become the primary focus of finance and insurance research (e.g., see Smith, 1986). Indeed, as researchers (e.g., Jensen, 1983; Smith, 1986) claim, this research orientation is important because normative economic questions (e.g., what is the optimal action(s) in policymaking?) cannot be answered effectively without a correct understanding of how alternative actions might affect outcomes. This understanding, as such scholars contend, can only be established through the use of a positive-descriptive research paradigm. As a result, various positive-descriptive theories have been developed and advanced in the academic literature to explain observed economic phenomena including the corporate purchase of insurance (e.g., see Smith, 1986).

3.2.2 Main Criticisms and Merits

Debate continues in the academic literature regarding the relative criticisms and merits of the normative-prescriptive and positive-descriptive theories (e.g., see Keita, 1997). Positive-descriptive theories have tended to be subject to two major types of criticism - namely, the conceptual basis employed and the type of research methods used (e.g., see Watts and Zimmerman, 1990). For example, critics like Tinker, Merino and Neimark (1982) argue that positive-descriptive theories are value-laden on the grounds that academic research is not socially neutral. Indeed, proponents of positive economic theory (e.g., see Watts and Zimmerman, 1990) acknowledge the importance of values (e.g., researcher's and user's preferences) in aspects of research design, such as the choice of topics, methods, and assumptions. Positive-descriptive theories have also been criticized for research method-related issues such as the lack of explanatory power in empirical tests and the possibility that unstated "alternative hypotheses" (often socio-cultural-based) could be relevant to the phenomena under investigation (e.g., see Ball, Foster, Nicholas and Jensen, 1982). However, in their defense, advocates of positive-descriptive theories (e.g., see Christie and Richard, 1990; Watts and Zimmerman, 1990) maintain that these issues could arise from researchers' limited understanding of theory and the lack of econometric skills rather than due to shortcomings in positive-descriptive theories *per se*. They add that many procedural problems can be addressed by using alternative proxies, incorporating tests for omitted variable bias and improving the linkage between theory constructs and empirical tests through better variable definition and measurement. On the whole, Watts and Zimmerman, (1990, p.149) point out that " . . . [these] criticisms have failed in [practical] tests because they had little influence on research. Researchers have not changed their approach. Referees and editors of journals have not asked researchers to alter their methodology. [Thus] the debate . . . has been less useful than the discovery and explanation of empirical regularities".

A major attribute of positive-descriptive economic theories lies in the fact that they have been successful in discovering empirical systematic patterns in many complex economic activities, and providing explanations/predictions of them (Watts and Zimmerman, 1990). Therefore, positive-descriptive theories provide intuitively plausible frameworks to guide empirical research (e.g., see Demski, 1988; Watts and Zimmerman, 1990). The corporate purchase of insurance, as a part of the organization's managerial financial decision-making set, could thus be explained by the application of financial economics-based positive-descriptive theories (e.g., see Smith and Stulz, 1985; Smith, 1986; Caillaud, Dionne and Jullien, 2000; Doherty, 2000a). As such, the main positive-descriptive-type theories that have been used in prior insurance-based research are reviewed extensively in the remainder of this chapter. Normative-prescriptive-type theories (e.g., Marxist theory) that critique and prescribe improvements to corporate financial behavior, however, are deemed not to be appropriate for the stated purpose of this study. As such, this body of theoretical literature is considered to be outside of the ambit of the literature review in this study.

3.3 ANALYSIS OF POSITIVE-DESCRIPTIVE THEORIES

3.3.1 Expected-Utility Theory

Expected-utility theory, first developed by Von Neumann and Morgenstern (1947), postulates that investors are typically expected utility maximization agents and risk averters (i.e., with concave expected utility functions)[30]. Therefore, the decision rule under uncertainty for such an investor is to select a course of action that either maximizes the expected return for a given level of risk or minimizes risk for a given level of return (e.g., see Copeland and Weston, 1992). An important feature of this theory is that it incorporates individual risk preferences in decision-making under uncertainty. As a result, expected-utility theory has been widely used in the analysis of

[30] Utility is a scale of measurement of the satisfaction derived from having monetary wealth.

risk choice decisions in the neo-classical economics literature (e.g., see Doherty, 2000b).

Expected-utility theory also has implications for the analysis of insurance purchases, because it could help to reveal the propensity for an individual to insure (e.g., see Garven, 1996; Caillaud et al., 2000; Doherty, 2000b). For instance, Doherty (2000b) notes that an individual with a concave utility function is likely to insure either fully at actuarially fair prices or partially in the presence of the transaction costs of insurance. Additionally, risk aversion has long been regarded as the primary factor that motivates the insurance purchases by individuals and corporations in the insurance literature (e.g., see Mossin, 1968; Schlesinger, 1981; Szpiro, 1985). Therefore, the expected-utility framework provides important insights into risk decision-making and hence, could be a conceptually useful basis for the analysis of corporate hedging (e.g., insurance) by individuals, individual proprietorships, partnerships, or closely-held corporations (e.g., see Smith and Stulz, 1985; Smith, 1986).

However, expected-utility theory has been subject to extensive critique in the insurance literature. There are three main shortcomings that weaken substantially the application of expected-utility theory in this study. First, as Doherty (2000b) observes, a technical difficulty with applying the expected-utility theory is that researchers have to calculate the expected utility of the decision-maker according to the precise form of his/her utility function. However, this information is often unavailable to researchers. Second, expected-utility theory is frequently criticized for its failure to consider the influence of external factors, such as competitive markets and industry regulation, upon corporate insurance decisions (e.g., see Garven, 1987). Third, expected-utility theory cannot satisfactorily explain the purchase of insurance by large and widely-held companies (e.g., see Mayers and Smith, 1982, 1986; Main, 1982a, 1982b, 2000; Smith and Stulz, 1985; Garven, 1996). This is because, according to the CAPM (Sharpe, 1964; Lintner, 1965; Mossin, 1966) and its later variants, shareholders can

reduce diversifiable risk cost-effectively through the management of their personal investment portfolios in the capital markets. Therefore, on the surface, the reduction of diversifiable (firm-specific) risk through (actuarially unfair) insurance may not by itself add value for the shareholders of large and widely-held companies (e.g., see Mayers and Smith, 1982; Main, 1982a, 1982b; Doherty, 2000b)[31].

Additionally, Smith (1986) reports that the corporate risk management literature using the expected-utility framework has paid insufficient attention to the fundamental differences between individuals and large and widely-held corporations (e.g., in terms of multiple contracting parties). Consequently, many applications of expected-utility theory have been developed on the over-simplified assumption that a firm can be treated as a risk-averse individual that can be represented by a single utility function (e.g., see Borland and Garvey, 1994; Doherty, 2000b; Main, 2000). This treatment thus ignores the "nexus of contracts" nature of the firm and the role of insurance in controlling agency conflicts (e.g., between debtholders and shareholders) (e.g., see Garven, 1987; Mayers and Smith, 1990; Doherty, 2000b)[32]. Indeed, Doherty (2000b, p. 50) adds that " . . . corporate risk management is more complex [than an individual's] and [thus] requires a study of interaction between [its] stakeholders . . . the [appropriate] description process must reflect the mechanisms with which these claims [of stakeholders] are resolved and how this resolution affects the value of the firm".

While some researchers claim that risk aversion by stakeholders of a company - for example, managers (Tufano, 1996), bondholders (Davidson et al., 1992), and/or employees (Parry and Parry, 1991) - could to some extent induce the corporate purchase of insurance, it is in essence the application of risk aversion within the

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[31] In view of the significant premium loading factors in transacting insurance (e.g., insurer's expenses and profit), investors may be worse off as a result of insurance hedging (Main, 1982a).

[32] According to Jensen and Meckling (1976), a firm is a nexus of contracts among various constituents such as shareholders, bondholders, managers, employees and customers.

general context of agency perspective that is arguably more important. Brennan (1995) thus argues that to provide meaningful insights into the corporate purchase of insurance, the notion of risk aversion must incorporate contracting relationships in the modern corporation. As such, expected-utility theory is deemed not to be an appropriate framework for the present study.

3.3.2 Contingency Theory

Contingency theory derives from the organizational science discipline and is predicated largely on the notion that organizational structures and management systems are determined by a combination of external factors (e.g., market competition) and firm-specific characteristics (e.g., technology and size) (e.g., see Ginzberg, 1980; Anderson and Lanen, 1999; Donaldson, 2001). The extent to which organizations are influenced by such contingent factors is deemed to be reflected in their business performance/effectiveness – i.e., a close fit leads to high performance and misfit results in low performance (e.g., see Woodward, 1965; Van de Ven and Drazin, 1985; Donaldson, 2001). In contingency theory, managers are thus predicted to seek a fit and/or avoid misfit by adapting organizational structures and systems to accommodate environmental and firm-specific changes (e.g., see Astley and Van de Ven, 1983; Donaldson, 2001). As a result, Donaldson (2001) argues that organizational performance is dependent upon the effectiveness of organizational structure responding to key contingencies such as business cycles, market competition, investment diversification, and operational and financial risk. Reported financial performance, in turn, could drive and induce changes in organizational structure and management systems (e.g., through divestment strategies).

In the contingency theory literature, organizational performance/effectiveness is defined broadly to include financial profitability and operational efficiency (Child, 1975), stakeholders' satisfaction (Dewar and Werbel, 1979), and product and service quality (Argote, 1982). In contrast, organizational structures and systems invariably

incorporate various management functions, such as strategic decision-making processes (Frederickson, 1984), human resource management procedures (Delery and Doty, 1996), and corporate accounting and reporting systems (Nair and Frank, 1980; Cooke and Wallace, 1990; Anderson and Lanen, 1999). Important contingencies identified in prior studies embrace external influences (e.g., environmental uncertainties, market competition and industry regulation) and internal (firm-specific) factors such as firm size, the state of technology, form of strategy (e.g., diversification versus consolidation), operational and financial risks and so on (e.g., see Donaldson, 2001).

Proponents of contingency theory (e.g., Ginzberg, 1980; Anderson and Lanen, 1999) posit that the framework helps to promote one's understanding of complex organizational phenomena such as the inter-entity differences in organizational structure and management practices (e.g., corporate hedging). Indeed, Ashby and Diacon (1998) employ a contingency-type approach to examine the motives for companies to purchase insurance in an oligopolistic market, which is characterized by a small number of relatively large companies competing with each other. They argue that corporate hedging activities, such as the purchase of insurance, could be influenced by managers' strategic responses to external market competition. For instance, Ashby and Diacon (1998, p.45) show that to maximize profitability, market participants may collectively purchase insurance in order to reduce industry-wide business risks such as those affecting firms' outputs and prices. Additionally, Das and Teng (2001) point out that strategic risk management (including insurance) might vary across companies depending on managers' perceptions of contingent factors such as environmental uncertainty. Thus, contingency theory could be an intuitively attractive theoretical framework within which to examine the relation between the level of corporate insurance and contingency factors. For example, external (environmental) contingencies (e.g., market competition and industry regulation) and internal (firm-specific) characteristics (e.g., company size and leverage) could be important determinants of the corporate decision to purchase insurance.

Despite its conceptual appeal, contingency theory has been subject to extensive critique in the literature (e.g., see Waterhouse and Tiessen, 1978; Schoonhoven, 1981; Hopper and Powell, 1985; Donaldson, 2001; Speklé, 2001). In essence, there are three main shortcomings that weaken substantially the case for employing contingency theory in this study. First, Barney (1990) raises the criticism that contingency theory has traditionally drawn little inspiration from the economics of the firm and rather appears to be isolated from it. This means that economic motives for organizational change (e.g., managerial self-interest objectives) tend to have been underplayed conceptually and thus remain largely unaddressed in contingency theory literature. Second, as Waterhouse and Tiessen (1978) and Hopper and Powell (1985) argue, contingency theory is not based on a finite and clearly defined set of propositions that are easy to measure consistently and test empirically. Indeed, Speklé (2001, p.420) further adds that " . . . this approach is more a general idea than an articulated theory in the sense that it has no *a priori* intuition of its own as to what the pertinent factors are and as to their likely consequences . . . [thus] notions about the variables and their effects . . . [often] come from [diverse] sources outside contingency theory *per se*". Given the dynamic socio-economic environment facing companies in China (e.g., with regard to State policies), extreme complexity could arise from applying a contingency theory-based approach in this research project. Third, support for the propositions of contingency theory inevitably involves demonstrating empirically that the fit between organizational structure/management systems and contingencies can affect positively organizational (financial) performance. However, due to the lack of insurance-related empirical studies using contingency theory, the nature of the fit and the extent to which environmental and organizational factors underpin the corporate insurance decision is not clear from the literature (e.g., see Anderson and Lanen, 1999; Speklé, 2001). For these reasons, it is felt that contingency theory does not provide a sufficiently developed framework within which to conduct this research project.

3.3.3 Market Signalling Theory

Market signalling theory is predicated on the notion that there are information asymmetries between corporate insiders (e.g., company managers) and outsiders (e.g., investors) with the former possessing private firm-specific knowledge (e.g., regarding investment opportunities) that the latter does not have (see Ross, 1977; Miller and Rock, 1985; Levy and Lazarovich-Porat, 1995). Signalling theory posits that to reduce information asymmetries and distinguish a particular company from others in the market, managers have incentives to signal inside information to uninformed outsiders by various means such as the voluntary disclosure of "good news" and/or the withholding of "bad news" (e.g., see Verrechia, 1983; Dye, 1985)[33]. Signalling devices could also include dividend policy choice, capital structure mix and the type of hedging activities, amongst others (e.g., see Talmor, 1981; Darrough and Stoughton, 1986; Brennan, 1995). Although the signalling process may be costly, firms might benefit from it in that the public dissemination of information could help to reveal the true value of the firm to the market without their managers disclosing potentially costly proprietary (confidential) information (e.g., see Talmor, 1981).

Various signalling-type hypotheses have also been developed to explain the corporate purchase of insurance and other hedging activities (e.g., see Doherty, 2000a). For example, efficient managers might use insurance to signal their professionalism and managerial ability to outsiders (e.g., see DeMarzo and Duffie, 1995; Han, 1996; Tufano, 1996). This is because hedging can help to reduce the amount of "noise" in the reported annual financial performance of firms, thereby making reported performance a more credible signal of the efficiency of managers[34].

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[33] These incentives could include the desire to increase the traded value of the firm (Fishman and Hagerty, 1989), reduce the market cost of capital (Diamond and Verrechia, 1991), or enhance the corporate public image (Firth, 1979). "Good news", for example, could be the successful launch of a new product, while "bad news" may arise where annual earnings are worse than expected.

[34] "Noise" refers to exogenous factors that are outside management control such as accidental losses (e.g., due to flooding), economic cycles, business interruption and technical problems of production that could not have been foreseen.

Similarly, Doherty (2000a) contends that corporate insurance may also be used to hedge earnings risk arising out of transient events and so leave the remaining persistent earnings fluctuations as a better signal for the underlying value of the company[35]. Grace and Rebello (1993) and Rebello (1995) further argue that insurance can be used by company managers with private information on expected cash flows/insurable losses to signal the "quality" of the firm to financial markets. Additionally, the purchase of insurance by a highly levered firm may signal to bondholders that managers are serious about maximizing the total value for all stakeholders rather than shareholders only (e.g., see Thakor, 1982; Campbell and Kracaw, 1990; Han, 1996). Main (1982b, 2000) also suggests that management may use insurance as a signal of their financial expertise and as such, the true risk profile of the company will accordingly be revealed to markets through the process of commercial insurance underwriting.

Levy and Lazarovich-Porat (1995) argue that signalling theory, by providing a plausible explanation, has conceptual appeal in bridging the gap between theoretical predictions and firms' actual financial management practices. Paul (1992, p.483) further adds that " . . . investors are interested in a signal to the extent that it resolves uncertainty about the firm's ultimate payoffs. The more uncertainty it resolves about firm payoffs, the more weight the signal receives in the stock price". This view thus could provide useful explanation for observed corporate risk management activities such as the purchase of insurance. Indeed, managers of publicly listed companies operating in an uncertain emerging market, like China, might disclose insurance details to the business community both formally (e.g., via prospectuses and/or the published annual report and accounts) and/or informally (e.g., through private communication) in order to signal their underlying economic value to prospective

[35] The term "transient events" refers to events occurred accidentally (e.g., a fire damage) and contain little information of a company's future earnings potential. In contrast, "persistent events" (e.g., a product liability claim) often arise from inherent operational reasons (e.g., weakness in the product quality control system) and so are likely to have implications for future trends in annual earnings (Doherty, 2000a).

investors.

Signalling theory, nevertheless, has been subject to some controversy in the academic literature. First, some researchers (e.g., Teoh and Hwang, 1991; Skinner, 1994) contest that signalling could produce biased predictions in that managers will disclose only "good news" and withhold "bad news". In contrast, Skinner (1994) argues that managers may have incentives to disclose "bad news" in order to avoid possible litigation from investors. Second, the predictions of signalling theory are often difficult to test and so not surprisingly, the framework lacks widespread empirical support. Indeed, Levy and Lazarovich-Porat (1995, p.39) also observe that " . . . virtually all [extant] signalling studies are theoretical . . . however, it is difficult, if not possible, to test signalling effects empirically". Such difficulty can arise from the ambiguity of theoretical predictions (e.g., see Miller and Rock, 1985; Puelz, 1992; Brennan, 1995). For instance, Brennan (1995, p.13) claims that ".... [signalling models] generally fail to yield empirical predictions beyond the ones for which they were custom tailored . . . [and] fail to show why one [signalling] instrument should be chosen over another. Moreover, the choice of objective function for the informed insider in signalling models has remained a matter of *ad hoc* convenience, and sometimes controversy". Difficulties associated with the application of empirical tests can further arise from technical problems such as the inability to hold all other parameters constant (Levy and Lazarovich-Porat, 1995) or the lack of key information (Kidwell, Sorensen and Wachowicz, 1987). For example, testing the signalling effect of debt insurance could involve comparing the borrowing costs with insurance purchase (allowing for the cost of insurance) with the borrowing costs without insurance for an issuer. However, the latter form of information is " . . . often not directly observable and must be estimated for each insured bond issue" (Kidwell et al., 1987, p.304).

As Puelz (1992) notes, such limitations with the empirical testing of signalling theory have severely restricted its application in empirical studies and therefore,

signalling theory is not considered to be an appropriate framework for the stated purpose of this project.

3.3.4 Option Pricing Theory

Option pricing theory postulates that decision choices (options) are contingent claims on the value of an underlying asset whose value can be modelled by five factors – the price of the underlying asset, the risk of the underlying asset, the risk-free rate of return, the exercise price, and the time to maturity (e.g., see Black and Scholes, 1973; Brennan, 1979; Cox, Ross and Runbinstein, 1979)[36]. Option pricing theory is relevant to many areas of corporate finance as securities could be interpreted as portfolios of puts and calls on the firm (Cox et al., 1979). Copeland and Weston (1992, p.289) also note that " . . . almost all financial assets are really contingent claims . . . [common shares,] risky debt, insurance, warrants, and convertible debt may all be thought of as options". For instance, equity in a levered company can be interpreted as a call option on the market value of the firm with the striking price equal to the face value of debt (e.g., see Black and Scholes, 1973). Thus, rational shareholders should exercise the call option by paying off the debt and keep any excess for themselves when the firm value exceeds the debt payoff. In contrast, they may choose to let the option expire and pass the ownership of the firm to creditors when the value of the firm drops below the face value of debt. Doherty (2000b) terms the latter as "the default put option" of shareholders. He further suggests that the value of equity can be denoted as the value of the firm minus the face value of debt plus the value of default put option; while the value of debt can be determined as the face value of debt minus the value of default put option by shareholders. Such reasoning thus adds clear option-type characteristics to corporate financial structure and the claims of various stakeholders on the firm (e.g., see Copeland and Weston,

[36] Options are derivative instruments that give the holder the discretion to buy/sell an underlying asset at an agreed price before or at a future date. However, there is an obligation for the option writer to fulfill the contractual terms if the holder chooses to exercise the option (e.g., see Copeland and Weston, 1992).

1992; Doherty, 2000b).

Option pricing theory also has important implications for corporate risk management in at least three regards as follows. First, options can be used to form investment portfolios in order to hedge corporate risk. Second, option pricing theory can be applied to the economic analysis of insurance because insurance policies, as contracts contingent upon the occurrence of insured events, tend to have "forward-like" or "option-like" features (Doherty, 2000b). For example, Doherty (2000b) argues that to insured, an insurance contract (policy) with deductible is essentially a call option with an exercise price equal to the deductible. Indeed, Hsieh et al. (1994) argue from a different angle that purchasing insurance is similar to holding a put option written by an insurance company. Third, as Doherty (2000b) contends, managing the default put option held by shareholders can be perceived as being at the heart of corporate risk management. This is because rational stakeholders are expected to behave strategically to affect the value of the default put option to their respective advantages – for example, the shareholders to increase the value of the put option and the bondholders to reduce it. According to option pricing theory, the value of the default put option by shareholders is affected by the overall level of risk associated with total firm value. For instance, if a firm's activities become more risky, the value of default put option held by shareholders increases. This, in turn, should have a direct adverse effect on the value of debt and the market cost of capital. It may also cause distortions in investment decisions as a consequence of the asset substitution and underinvestment problems[37]. Thus, managing risk and lowering the value of default put option by shareholders could help to " . . . eliminate this opportunistic game playing and make everyone better off [through the saving in agency costs and the improved investment decision making]" (Doherty, 2000b, p.184).

[37] The asset substitution problem refers to the behavior for company managers to switch to a high-risk investment project after debt has been issued. In contrast, the underinvestment problem, first advanced by Myers (1977), refers to the possibility that after an event loss, projects with a positive net present value might be rejected by companies because their managers feel that the benefits of such investment will be realized mainly by debtholders rather than the shareholders with whom managers' economic interests may be aligned via share option plans (e.g., see Doherty, 2000b).

Therefore, option pricing theory could provide useful insights into the analysis of corporate risk management activities, including the purchase of insurance. Indeed, some prior studies have applied option pricing models to examine the demand and supply of insurance (e.g., see Hsieh et al., 1994; Doherty and Garven, 1996).

Some researchers (e.g., Rubinstein, 1974; Brennan, 1979) note, however, that the conceptual appeal of option pricing theory rests on the measurability of the value of the underlying assets on which an option is written. However, Doherty (2000b) observes that in contrast to an option that is written on another type of traded financial asset (e.g., shares), an insurance policy is written to cover an insured from accidental perils (e.g., a fire loss or liability suit). Therefore, he avers (p. 189) that " . . . it would be inappropriate to price the insurance policy using [the] Black-Scholes [option pricing model], because the probability distribution that underlies insurance losses is unlikely to be the same as that which is assumed to specify the movement of stock prices". Doherty and Garven (1996) apply a discrete-time option-pricing model to estimate the "fair" rate of return for a property-liability insurance company. But as they acknowledge (p.1048), " . . . the rationale for the use of this model is that the financial claims [of stakeholders] can be modelled as options written on the income generated by the insurer's asset portfolio. This portfolio consists mostly of traded financial assets and is therefore relatively easy to value. . . . [However,] such conditions do not necessarily prevail in other [non-financial] industries". It is felt that this major limitation thus inhibits the use of option pricing theory as a framework for the empirical test of the determinants of property insurance purchase in the Chinese corporate sector where the asset portfolios of many companies are likely to be extremely difficult to value from published sources of information.

3.3.5 Stakeholder Theory

Stakeholder theory, as mainly developed by Freeman (1984), postulates that various constituents, such as capital suppliers (i.e., shareholders, debtholders) and

non-investor stakeholders (e.g., managers, employees, customers), possess legitimate and equal claims on a modern corporation (e.g., see Donaldson and Preston, 1995)[38]. Legitimacy can be established either through explicit contractual obligations (e.g., debt covenants) and/or by unwritten implicit arrangements (e.g., continuing after-sale service promises to customers) (e.g., see Adams and Hardwick, 1998). Stakeholder theorists - Cornell and Shapiro (1987), amongst others - also develop the concept of net organizational capital as an analytical tool to link a firm's market value and its implicit claims[39]. Predicated on the notion that the market value of a firm depends on the price at which both its explicit and implicit claims can be sold, stakeholder theory posits that corporate management aims to strike a balance between the diverse legitimate claims of its stakeholders – both explicit and implicit claimants - in order to achieve better economic performance, *ceteris paribus* (e.g., see Cornell and Shapiro, 1987; Roberts, 1992; Donaldson and Preston, 1995). Stakeholder theory suggests that non-investor stakeholders also " . . . play an important role in corporate financial policy, and [thus] constitute a vital link between corporate strategy [e.g., hedging] and corporate finance . . . [this] leads to new interpretations of classic problems in finance" (Cornell and Shapiro, 1987, p.5). Therefore, proponents of stakeholder theory (e.g., Barton et al., 1989; Hill and Jones, 1992; Roberts, 1992) conclude that stakeholder theory provides a viable framework within which to examine management decision-making strategies[40].

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[38] As Freeman (1984, p.31) reports, a widely accepted definition of stakeholders is " . . . those groups without whose support the organization would cease to exist".

[39] Organizational assets represent intangible resources (e.g., reputation for prudent management) arising from the selling of implicit claims and equals the potential revenues from using these assets. Organizational liabilities equal the expected costs of honoring a firm's current and future implicit claims. The difference between such assets and liabilities thus represents the net organizational capital accruing to shareholders. Positive net organizational capital should increase the firm value (e.g., see Cornell and Shapiro, 1987; Barton, Hill and Sundaram, 1989).

[40] For instance, Cornell and Shapiro (1987) maintain that stakeholder theory can help to explain the cross-sectional variation of capital structure among companies. They hypothesize that firms with higher levels of net organizational capital are more likely to be predominantly financed by equity.

Cornell and Shapiro (1987) report that the relevance of stakeholder theory to explaining corporate behavior (e.g., hedging through insurance) lies in its ability to link firm value to the impact of corporate policy on the expected pay-offs to a firm's implicit claimants. Because the expected pay-offs on implicit claims are uncertain *ex-ante* and contingent on the future condition of the firm, tacit claimants thus run the default risk by the firm even when the possibility of bankruptcy is remote[41]. Therefore, the value of implicit claims (e.g., of customers) tends to be sensitive to information about the firm's financial condition, including its influential financial policy (e.g., capital structure and corporate hedging). For instance, an announcement of shocks, such as a major uninsured loss and/or product recall, should induce stakeholders to anticipate the possible reduction in the pay-offs on implicit claims. This expectation should thus reduce the prices of current and future implicit claims of the firm and often this tends to have a larger negative impact on the value of the firm than the actual cash outlays involved. Indeed, following such reasoning, some researchers (e.g., see Grillet, 1992b, 1993) have attempted to explain the motives for corporate purchase of insurance from a stakeholder perspective. For instance, Grillet (1992b, 1993) argues that insurance can help to reduce the uncertainty with the expected pay-offs on implicit claims by lowering the possibility of financial distress and reducing the cash flow volatility risk of a firm[42]. This, in turn, could raise the price at which a firm's future implicit claims can be sold, thereby boosting a firm's net organizational capital and market value.

Nevertheless, many researchers (e.g., Cornell and Shapiro, 1987; Barton et al., 1989) recognize the technical difficulties of testing empirically stakeholder theory. For example, Barton et al. (1989, p.37) recognize that " . . . the main obstacle . . . lies

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[41] Cornell and Shapiro (1987, p.6) argue that implicit claims are often " . . . too nebulous and state contingent to reduce to writing at a reasonable cost, [and thus,] they [normally] cannot be unbundled and traded independently from the goods and services the firm buys and sells". Therefore, implicit claims have little legal standing.

[42] Wruck (1990, p.421) defines financial distress as " . . . a situation where cash flow is insufficient to cover current obligations". Financial distress does not, therefore, necessarily lead to actual bankruptcy.

in the difficulty of operationalizing the net organizational capital construct and to assess the nature of the information possessed by the firm's stakeholders. . . [This is because] implicit organizational assets and claims are neither formally stated nor formally priced . . . [and] are not traded in any public market place. Hence the direct measurement of net organizational capital is problematic". As a result, stakeholder theory often lacks widespread empirical support (e.g., see Donaldson and Preston, 1995). It is considered that such limitation precludes the use of stakeholder theory in explaining insurance purchases in the developing Chinese corporate sector. The Chinese market is also one where the explicit and implicit claims of certain stakeholders (notably the State) predominate over the interests of others.

3.3.6 Transaction Cost Economics

Transaction cost economics (TCE) is predicated on two major assumptions of contracting bahavior – bounded rationality and opportunism (e.g., see Williamson, 1990)[43]. TCE also posits that economic transactions differ in three key regards - namely, asset specificity[44], uncertainty and frequency (e.g., see Williamson, 1985). Therefore, transaction costs can vary depending upon the interaction between bounded rationality, opportunism, and transaction-specific factors such as asset specificity (e.g., see Blair and Karserman, 1983). In addition, proponents of TCE (e.g., Williamson, 1985, 1988, 1990) argue that there is usually more than one form of institutional arrangement/governance structure available to organize economic

[43] Bounded rationality means that although economic agents intend to behave in a purely rational manner, they are limited by their inability to anticipate, describe, or pre-specify responses for all future contingencies involved in a contract (e.g., see Hart, 1995). Opportunism, which is similar to moral hazard, refers to self-interest seeking behavior with guile - i.e., the ability of contracting parties to use cunning to extract residual profits or quasi rents (e.g., see Williamson, 1990). Quasi rents are returns in excess of that required to maintain a resource's service, to recover sunk investment costs and short-run opportunity costs of the resources committed (e.g., see Jensen, 1986).

[44] Williamson (1990, p.12) defines asset specificity as " . . . the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value". Asset specificity can further be classified into site specificity, physical asset specificity, human asset specificity, and dedicated asset specificity. For a discussion of asset specificity in an insurance industry context, see Adams (1997).

transactions. Such structures may range from centralized hierarchies at one extreme to fragmented individual market contracting at the other, with mixed or intermediate modes (i.e., hybrids) in-between. However, these governance structures are expected to differ in both the type of control mechanisms that they employ and their relative efficiency (e.g., see Williamson, 1985). The main tenet of TCE is for managers and other parties to align contractual relationships with governance structures in a transaction cost economizing way (e.g., see Shelanski and Klein, 1995). Therefore, the likelihood of observing integrated governance structures (e.g., vertical integration/hierarchies) is expected to depend directly on the degree of asset specificity, the level of uncertainty, and the frequency of transactions (Coles and Hesterly, 1998). Indeed, Shelanski and Klein (1995, p. 336) note that TCE is " . . . now used to study a variety of economic relationships [in firms], ranging from vertical and lateral integration to transfer pricing, corporate finance, marketing, the organization of work, long-term commercial contracting, franchising, regulation, the multinational corporation, . . . and many other contractual relationships".

There are two main rationales for applying TCE to explain insurance purchasing decisions. First, Williamson (1988, 1990) contends that the notion of transaction includes the process of exchange between parties and the form of contract covering such aspects as product purchase, labor employment, finance and so on, with governance structures covering aspects such as transactional administration and organization. Therefore, by analogy, the exchange of risks between a firm and a commercial insurer formalized through an insurance policy could be regarded as a hedge transaction, while the risk pooling of a commercial insurer could be treated as a form of governance structure for multiple hedges. In other words, the decision to retain/self-insure or transfer corporate risks via insurance is essentially a kind of "make-or-buy" decision - the so-called "paradigm problem" of TCE (e.g., see Shelanski and Klein, 1995). Second, corporate insurance can be viewed as another type of financial contract - namely, a contingent post-loss financing mechanism (e.g., see Mayers and Smith, 1982; Caillaud et al., 2000; Doherty, 2000a). Indeed, Grillet

(1992a) suggests that effective property/liability risk management should be viewed as an integral part of capital structure optimization in that by reducing the expected costs of financial distress through insurance, a firm can expand its debt capacity. Therefore, a TCE framework could help to explain the economic rationale for the corporate purchase of insurance[45].

Some studies have indeed sought to analyze insurance purchases using concepts derived from the TCE. For example, Bjuggren (1995) argues that given the possible influence of asset specificity on the choice of capital structure and the inter-relation between capital structure, costs of financial distress and insurance, the degree of asset specificity of a firm may motivate the corporate purchase of insurance. Others (e.g., Grillet, 1992a, 1993; Main, 2000) maintain that insurance could enable firms to economize on the transaction costs of hedging because insurance companies are able to realize cost efficiencies by pooling low-frequency/high-loss risks. Such efficiencies could also arise from other factors such as insurers' expertise in risk pricing and loss prevention; their skills in writing, monitoring and enforcing contracts; their comparative advantages in areas of loss adjustment and claims handling. Additionally, insurance can help firms to cost-effectively reinvest after a major accidental loss at *a priori* fixed cost rather than seeking potentially costly external financing (e.g., see Froot, Scharfstein and Stein, 1993; Caillaud et al., 2000; Doherty, 2000b). Furthermore, Skogh (1989, 1991) contends that insurance underwriters could play an important external monitoring role in inhibiting opportunistic behavior by company managers (e.g., the passing up value-increasing safety project investments), thereby enhancing the degree of co-operation among company stakeholders and so further reducing frictional (e.g., monitoring) costs for firms. This is because writing insurance gives insurers incentives to screen policyholders' risk profile (adverse

[45] While commercial insurance may economize on the management of property/liability risk, it is not a panacea for all corporate risks. For instance, it may not be optimal for many core business risks (e.g., credit risk), wherein insurers do not possess comparative advantages in risk bearing, to be hedged through commercial insurance (e.g., see Sung, 1997; Doherty, 2000a).

selection) *ex-ante* and monitor policyholders' behavior (moral hazard) *ex-post* (e.g., see Grillet, 1993; Han, 1996). Grillet (1992a) also recognizes that the (social) costs of limited shareholder liability[46] can to some extent be internalized within firms through the purchase of insurance and this could help to enhance " . . . the optimal risk allocation for [and economization on the payouts to] the firm's [non-shareholder] claimants" (p. 245).

Despite its conceptual qualities, TCE has also been subject to extensive critique in the academic literature (e.g., see Kay, 1992; Shelanski and Klein, 1995; Speklé, 2001). Three major limitations, in particular, appear to hamper its application in this research project as follows. First, TCE has been charged with having a too narrow economic view of individual and firm behavior (e.g., see Shelanski and Klein, 1995; Speklé, 2001). TCE thus neglects some important factors on the corporate insurance decision such as the social satisficing behavior of managers, the risk alleviation effects arising from business diversification, and the regulatory status of firms. Second, Shelanski and Klein (1995) cite the technical problems in testing empirically TCE theory in multi-industry studies as key variables (e.g., asset specificity, uncertainty, frequency) are often hard to operationalize and measure consistently across firms and industries. As a result, " . . . the bulk of the empirical literature [in TCE] consists of case analyses [where variables] are estimated based on surveys or interviews [e.g., asset specificity is often measured by interviewee's ranking on the degree to which an investment has value in outside uses] . . . Such data are of course subject to the general limits of survey data [- for example,] . . . [subjective] valuations . . . [and] hard to compare [among industries]" (Shelanski and Klein, 1995, p.339). In the Chinese corporate sector, TCE-related information (e.g., the frequency of transactions) is neither always available from the public sources nor easily collectable through field research due to regulatory/legislative restrictions on data access. Third, Williamson (1988, p.589) admits that " . . . by contrast with the formal modelling apparatus associated with much of the financial economics literature, the [TCE] approach to corporate governance and corporate finance is of a relatively

[46] The costs of limited liability include the economic as well as the social costs (e.g., job losses) imposed on a firm's non-equity stakeholders when the shareholders default on the downside risk of firm value triggered by a major accidental loss (e.g., see Grillet, 1992a).

pre-formal kind". Main (2000, p.235), in reviewing the major arguments for applying TCE to corporate insurance, also notes that transaction cost is such a comprehensive concept that " . . . there remains substantial uncertainties over how wide or encompassing the notion of transaction cost is in its influence on the motivation for corporate insurance purchase, and hence there [is] substantial scope for more precise analysis". In view of the above limitations, TCE is not considered to be the best framework to guide the present study.

3.3.7 Agency Theory

Agency theory is predicated on the notion that economic groups are (unlimitedly) rational and self-interest utility maximizers, and that the agency relationships between such constituents (principals and agents) are established through contracts (e.g., see Eisenhardt, 1989; Baiman, 1990)[47]. Jensen and Meckling (1976) were amongst the first to advance the view that the modern corporation comprises a nexus of contracts among different interest groups. In the finance literature, two main types of agency problems/incentive conflicts tend to predominate when there is a separation of ownership from operational control – namely, manager-owner and debtholder-owner conflicts (e.g., see Fama and Jensen, 1983; Wong, 1988; Eisenhardt, 1989).

The interests of managers may diverge from shareholders' value-maximizing interests either because of their different utility functions (e.g., with regard to maximizing rewards) or risk aversion (e.g., due to their inability to diversify their human capital investment in the firm) (e.g., see Wong, 1988; Scordis and Porat, 1998;

[47] An agency relationship exists when one or more owners (called principals) employ others (called agents) in order to delegate some decision-making authority and responsibilities to the latter through contracts (either explicitly or implicitly). Agency costs are the sum of monitoring expenditures by the principals, bonding expenditure by the agents, and residual loss borne by the principals (e.g., see Jensen and Meckling, 1976). While both monitoring and bonding costs are out-of-pocket costs, the residual loss represents the potential decrease in the welfare of the principals resulting from the agent's deviation from the optimal behavior (e.g., see Smith, 1986).

Tihanyi and Ellstrand, 1998). Likewise, agency problems between managers, shareholders and debtholders can arise from differences in the nature of their economic claims (e.g., see Wong, 1988; Eisenhardt, 1989). For instance, in a firm with risky debt, managers (whose interests can be aligned with those of shareholders through share options) may act to increase the wealth of shareholders at the expense of debtholders via financing and investment decisions (e.g., see Wong, 1988; Doherty, 2000b). Typically, managers/owners are able to reduce debtholders' utility by means of asset substitution and/or underinvestment. Therefore, in situations where incentive conflicts can arise, contracting constituents have incentives to introduce monitoring mechanisms (e.g., audits) and contracts (e.g., insurance) to ensure that their economic interests are protected. Agents could also have incentives to engage in bonding activities in order to signal their integrity to the principals, because rational principals can anticipate and adjust for their potential opportunism in *ex-ante* pricing of payoffs to them.

Opponents of agency theory (e.g., see Kaplan, 1983; Baiman, 1990; Nilakant and Rao, 1994) criticize the key assumption of (unlimitedly) rational behavior on the grounds that it neglects human attributes of trust and fairness in business relationships. Agency theory has also been criticized for its highly stylized and simplified principal-agent models (e.g., see Baiman, 1990). For instance, most principal-agent models take a restricted view of the environment in which the firm operates. However, in response, proponents of agency theory (e.g., see Ross, 1987; Eisenhardt, 1989) argue that these criticisms do not reduce the empirical testability of the fundamental constructs of agency theory. They suggest that agency theory has, in fact, become the main framework in explaining managerial behavior in the financial-economics literature.

Many researchers (e.g., Mayers and Smith, 1982, 1986; Smith, 1986; Fields and Tirtiroglu, 1991; Pottier and Sommer, 1997) also argue that agency theory provides an appealing framework for insurance research. For example, Smith (1986,

p.699) notes that " . . . one example of an insurance application of agency analysis is the corporate demand for insurance [where] since the demand . . . arises, not from an individual but from a corporation, agency analysis [thus] offers a quite productive framework for analysis . . . In contrast, the [prior] insurance literature has paid insufficient attention to the fundamental differences between individual and corporate purchasers ". Indeed, a number of scholars have attempted to explain the motives for the corporate purchase of insurance using an agency theory perspective. For instance, several authors (e.g., see MacMinn, 1987; Mayers and Smith, 1987; MacMinn and Han, 1990; Garven and MacMinn, 1993; Doherty, 2000b) argue that commercial insurance can be used to mitigate asset substitution and underinvestment problems in firms, thereby reducing the risk of debt and ultimately lowering their market cost of capital. Other scholars (e.g., Campbell and Kracaw, 1987; Grillet, 1992a) also contend that insurance can help to control the manager-owner conflicts – for example, by helping to protect job security following a catastrophe[48]. This can be achieved as a result of the efficient monitoring role of insurance companies *vis-à-vis* outside shareholders (e.g., see Main, 1982; Mayers and Smith, 1982; Holderness, 1990)[49], insurance's bonding role for managers to signal their integrity (e.g., see Mayers and Smith, 1982), or insurance's function in facilitating the design of efficient incentive compensation that helps to align the interests of managers with those of shareholders (e.g., see Han, 1996; Sung, 1997; Doherty, 2000b). These analyses have yielded some testable hypotheses regarding the motivation for the corporate purchase of insurance Indeed, several studies (e.g., Mayers and Smith, 1990; Core, 1997; Hoyt and Khang, 2000) have tested empirically some of these agency-based hypotheses in developed markets such as the US. These studies could provide a useful benchmark against which the results of this study in an emerging market can be compared and evaluated.

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[48] However, Tufano (1998) reports that insurance purchases may under certain circumstances actually exacerbate manager-owner conflicts. For instance, while cash flow hedging through insurance allows firms to mitigate underinvestment problem, it may be misused by managers for their own benefits - for example, to reinvest in a non-economic project in order to protect their job security and/or promote their prestige.

[49] Insurance company's agreeing to compensate for potential loss automatically bonds the quality of such monitoring (e.g., see Grillet, 1993; Han, 1996).

Accordingly, it is considered that on balance, agency theory provides the most appropriate and viable framework within which to conduct the empirical part of this research project.

3.4 CONCLUSION AND SUMMARY

This chapter reviews critically the main extant positive-descriptive theories that have been advanced in the academic literature in order to explain the corporate purchase of insurance. Positive-descriptive theories and hypotheses are adjudged to be more compatible with the stated aim of explaining the determinants of discretionary purchase of property insurance by Chinese publicly traded companies than alternative normative-prescriptive approaches.

One appropriate and viable framework that can be utilized to explain corporate insurance purchase decisions is considered to be agency theory. The major thrust of agency theory is that it views the modern corporation as a nexus of contracts among various parties that have incompatible economic interests. The agency theory literature suggests that insurance is an important contracting mechanism that can help to resolve incentive conflicts between contracting constituents in firms - particularly managers, shareholders and debtholders. The results of prior agency theory-based insurance research also provide a useful comparative basis against which the findings of this China-based study can be evaluated. The major constructs of agency theory and their capacity for contributing insights into the determinants of insurance purchase by companies of diffuse ownership structure are examined in more detail in the next chapter of this thesis.

CHAPTER 4: HYPOTHESES DEVELOPMENT

4.1 INTRODUCTION

To explain the motives for the discretionary purchase of property insurance by publicly listed Chinese companies, a theoretical framework is utilized in order to direct the empirical part of this study. A search of the academic literature carried out in Chapter 3 identifies agency theory as the most appropriate framework that can be used to provide guidance on the empirical part of this study. This chapter thus puts forward five main hypotheses derived from agency theory in order to facilitate empirical testing. The motivations for seven key control variables and three interaction terms are also provided in this chapter of the thesis.

4.2 HYPOTHESES DEVELOPMENT

As Chapter 3 (section 3.3.7) makes clear, manager-owner and shareholder-debtholder conflicts are two important facets of agency theory. However, the purchase of insurance can help to mitigate such incentive conflicts between shareholders and managers and thereby reduce associated agency costs in four key regards as follows. First, by shifting business risk to insurance companies, a more efficient allocation of risk can be achieved – for example, by reducing the level of insolvency risk borne by managers, companies can reduce the risk premiums paid to them (e.g., see Mayers and Smith, 1982; Smith and Stulz, 1985). Second, insurance can play an important role in mitigating the asset substitution and underinvestment problems resulting from incentive conflicts between shareholders and debtholders (MacMinn, 1987; Mayers and Smith, 1987). Third, insurance companies have advantages over outside shareholders in controlling and monitoring managerial behavior. For example, insurance can help to facilitate value-adding investment through the specification of loss prevention measures and/or by providing safety advice (Mayers and Smith, 1982; Grillet, 1992b; Hoyt and Khang, 2000). Such measures also reduce the risk of value diluting opportunistic behavior by managers (Skogh, 1991). Fourth, by filtering out the adverse influence of incidental property/liability risks on company performance, not only can managers' risk-bearing be lowered, but also the observability of their

efforts and productivity can be improved. In this way, incentive-based compensation contracts can be closely tied to managerial performance (e.g., see Campbell and Kracaw, 1987; Han, 1996; Doherty, 2000b). Additionally, Stulz (1990) and Doherty (2000b) also note that manager-owner and shareholder-debtholder conflicts could vary among corporations of different organizational characteristics. As such, managerial decision to purchase property insurance and the extent to which it is used is also expected to vary amongst Chinese publicly listed companies depending upon their organizational features. Five hypotheses drawn from agency theory are thus put forward as follows.

4.2.1 Managerial Share Ownership

Chen, Steiner and White (2001) argue that corporate risk management decisions reflect not only organizational capital structure, but also firms' ownership structure. The academic literature (e.g., Smith and Stulz, 1985; Doherty, 2000b; Hoyt and Khang, 2000; Chen et al., 2001) has established that corporate hedging policy (e.g., through insurance) can be affected by the degree of managerial ownership. There are two competing hypotheses concerning the influence of managerial ownership on corporate risk management, namely, the *managerial incentive-alignment* and the *managerial risk-aversion* hypotheses.

Proponents of the *managerial incentive-alignment* hypothesis (e.g., Saunders, Strock and Travlos, 1990; Staking and Babbel, 1995) argue that the shareholders' ownership rights position can be viewed as a call option on the assets of a firm, and that the value of this call option can appreciate (depreciate) by increasing (decreasing) the risk of the underlying assets. Therefore, as the managers' ownership in the firm increases, their economic interests are expected to become more closely aligned with those of shareholders, thereby creating a strong agency incentive to maximize the value of their call options by increasing the level of risk (e.g., via investment strategy). Cummins and Sommer (1996), Core (1997), Hoyt and Khang (2000), and Chen et al. (2001) cite evidence supporting this hypothesis. On the other hand, the *managerial risk-aversion* hypothesis, advanced by Smith and Stulz (1985), posits that as their ownership increases managers are likely to become increasingly risk averse because they have a greater economic interest vested in the company. As a result,

managers are likely to pursue hedging (e.g., via insurance) and other risk management activities even if risk-taking could increase the market value of owners' equity. This is because optimizing their long-run compensation depends on the level of managerial job security and the survival of the company (DeMarzo and Duffie, 1995). Indeed, May (1995), Berkman and Bradbury (1996), and Chen et al. (1998) find evidence consistent with the *managerial risk-aversion* hypothesis.

Smith and Stulz (1985) and Doherty (2000b) further argue that the propensity for managers to engage in corporate risk management can be influenced by the nature of their compensation packages. More specifically, managers holding large blocks of ordinary shares would adopt hedging strategies, while those with substantial equity option rights would prefer a greater degree of risk taking, other things being equal. This is because the payoff of holding ordinary shares is expected to be linear function of firm value, whereas equity options provide managers with convex payoffs (Doherty, 2000b). Thus, hedging (e.g., through insurance) can reduce the downside payoffs related to ordinary shares and lower the value of equity options held. Smith and Stulz (1985) and Smith (1986) also contend that, in addition to equity options, other option-like compensation packages (e.g., bonuses based on the level of annual reported accounting earnings) that make manager's expected utility/end-of-period wealth a convex function of firm value, can also discourage corporate hedging. In contrast, company managers mainly rewarded with a flat-rate salary are less likely to hedge as they have no direct pecuniary interests in hedging (Doherty, 2000b). Consistent with the above prediction, Tufano (1996) finds that in the US gold mining industry, firms whose managers held ordinary shares are more likely to hedge gold price risk; in contrast, those firms whose managers held large equity options are less likely to hedge.

Wei (2000) reports that about 60 percent of managers in publicly listed Chinese companies owned ordinary shares at the end of 1998; however, the extent of managerial shareholdings are minor (typically less than 0.01 percent of total shares outstanding) (Sun et al., 2002). In addition, equity-option plans are still very rare in China. Therefore, I expect that the *managerial risk-aversion* hypothesis is likely to dominate over the *managerial incentive-alignment* hypothesis. In other words, I

expect a positive relation between managerial ownership and the incidence and level of corporate purchase of property insurance. Therefore:

Hypothesis 1a: Companies with high managerial share ownership are more likely to purchase property insurance than companies with low managerial share ownership (ceteris paribus).

Hypothesis 1b: If property insurance is purchased, companies with high managerial share ownership are likely to purchase greater amounts than companies with low managerial share ownership (ceteris paribus).

4.2.2 State Ownership

Shleifer and Vishny (1986) and Admati, Pfleiderer and Zechner (1994) argue that relative to small shareholders, large (institutional) shareholders are more likely to have the incentives and abilities to effectively monitor and control incumbent management. Consequently, the existence of a large shareholder in a firm's ownership structure could help to mitigate agency conflicts between shareholders and management. Tian (2001) notes that substantial State ownership is one of the main features associated with publicly listed Chinese companies. Indeed, the State (i.e., local and national government) is a major shareholder retaining a controlling interest in roughly 30 percent of publicly listed companies (Organization for Economic Cooperation and Development (OECD), 2000).

However, State ownership has traditionally been viewed as contributing to, if not causing, corporate inefficiency (Vickers and Yarrow, 1998). In China, while the ultimate ownership of State-held shares belongs to the central government, the "real" control rights and monitoring responsibilities are in practice delegated to government departments or their agencies (e.g., the Bureau of State-owned Assets Management (BSAM)). The official responsibility of these delegated bodies is defined as preserving and increasing the value of State-owned assets (Xu and Wang, 1999). However, as several scholars (e.g., see Jefferson, 1998; Perotti et al., 1999; Xu and Wang, 1999; Sun et al., 2002) observe, this unique institutional feature can lead to

severe manager-owner agency problems in State-controlled publicly listed Chinese companies for two main reasons. First, State ownership is reported to be ambiguously defined and hence akin to a public good (Jefferson, 1998). Second, the government departments and agencies that represent State interests often fail to effectively fulfil their ownership functions (Xu and Wang, 1999; Sun et al., 2002). The incentives for these State agencies to monitor closely management in the companies they oversee invariably do not exist in practice and would, in any case, be hampered by acute information asymmetries between the government body and incumbent management (Willhelm, 1999). Additionally, Gul (1999) notes that State-based policies (e.g., with respect to social welfare issues) may sacrifice firms' investment opportunities and adversely affect their prospects for long-term growth. Indeed, prior studies (e.g., Xu and Wang, 1999; Chen and Jiang, 2000; Qi et al., 2000) find evidence that the existence of a major State shareholder may have a deleterious impact on company financial performance. Gul (1999) further reports that in China State ownership tends to be negatively associated with corporate investment opportunity set. Therefore, it is unlikely that an inefficient State shareholder will encourage company managers to take out property insurance as a way of mitigating manager-owner conflicts. Nonetheless, Tian (2001) recognizes that the existence of a large State shareholding could be a positive influence on corporate value as the government may provide financial resources and other benefits (e.g., business contacts and subsidies). This suggests that where the State is a major shareholder, managerial incentives to purchase property insurance to hedge asset-loss risks (and control agency conflicts) could be reduced because of possible "charity hazard" effects (e.g., see Browne and Hoyt, 2000)[50]. Moreover, the greater the State's shareholding interest in companies the less likely it is (e.g., for social welfare reasons) that shareholders will exercise the default put option in the event of a severe fortuitous loss. In other words, the value of the default put option held by shareholders declines the greater the value of the State's interest in the total equity value of the firm. This implies that the underinvestment incentives following a major fortuitous loss could be reduced in State-owned companies. Therefore:

[50] "Charity hazard" refers to the situation when external (free) financial support is available in the event of a major catastrophic loss (e.g., from the government or other sources), the managerial incentives to manage such risks are reduced.

Hypothesis 2a: Companies with low State shareholdings are more likely to purchase property insurance than companies with high State shareholdings (ceteris paribus).

Hypothesis 2b: If property insurance is purchased, companies with low State shareholdings are likely to purchase greater amounts than companies with high State shareholdings (ceteris paribus).

4.2.3 Leverage

High leverage can be costly for corporate stakeholders because it can result in deadweight losses due to financial distress – be it direct (e.g., legal fees) or indirect costs (e.g., the loss of goodwill) (Warner, 1977; Grillet, 1992a). Indeed, Warner (1977) finds evidence that the indirect costs of financial distress are often greater than the direct costs. Financial distress (or insolvency) can arise following a major uninsured property/liability loss (MacMinn, 1987; Doherty, 2000b). The purchase of property insurance, however, can reduce the probability of financial distress triggered by uninsured accidental losses and hence reduce/eliminate the expected costs of financial distress (Mayers and Smith, 1982; Smith and Stulz, 1985). As a result, firm value could increase as a result of a reduction in financial distress costs and agency costs (e.g., monitoring expenditures) among corporate stakeholders and/or increased economic benefits (e.g., tax-related) associated with increased debt capacity (Main, 1983; Shapiro and Titman, 1986; Tufano, 1996). The magnitude of the costs of financial distress is expected to be a positive linear function of the probability of financial distress in the absence of hedging and the costs to be incurred if financial distress occurs (Smith and Stulz, 1985). The former is directly related to a company's financial leverage and hence, a highly indebted company is likely to have a greater possibility of financial distress compared with a lowly levered company (Mayers and Smith, 1982). In contrast, as suggested by Warner (1977) and Mayers and Smith (1990), the (direct) costs of financial distress are non-proportionally determined by company size, i.e., the direct costs of financial distress are likely to be more significant for small companies. In emerging markets, such as the PRC, economic uncertainties would also enhance the risk of debt default and so increase the market cost of capital for companies (Karmel, 1996; Xu and Wang, 1999). Although publicly

listed companies have until recently rarely become bankrupt in China (e.g., due to government intervention), this does not mean that such companies are free from the risk of financial distress. For them, such risks are mainly manifest in the high indirect distress costs – for example, the loss of goodwill and the difficulty in raising future external capital. Thus, the greater the expected costs of financial distress the greater the likelihood that a firm's managers will purchase property insurance, other things being equal.

Jensen and Meckling (1976) argue that company shareholders have incentives to transfer wealth from bondholders through excessive *ex-post* risk taking. Two dimensions of this wealth transfer are asset substitution and underinvestment problems (see Chapter 3, section 3.3.4). Realizing that shareholders/managers can behave opportunistically *ex-post*, rational bondholders will either charge a higher rate of interest or require insurance coverage to give them *ex-ante* protection. Indeed, Davidson et al. (1992) attribute the primary reason for the corporate purchase of insurance to bondholders' "me-first" rules that seek to protect them against insolvency risk.

MacMinn (1987) further shows that the corporate purchase of insurance can reduce the incentives for managers to substitute promised investment projects with risky ventures. This is because insurance makes debtholders' payoffs relatively independent of project selection and so limits the ability for the company to shift business risk onto bondholders. On the other hand, Mayers and Smith (1987), Schnabel and Roumi (1989), and Garven and MacMinn (1993) demonstrate that a property insurance contract can be used to mitigate the underinvestment problem and bond subsequent corporate investment decisions. As a result, shareholders can capture a gain in value that is equal to the agency costs (e.g., the reduction in the market cost of capital) minus the premium loading (Garven and MacMinn, 1993). Following another line of reasoning, Grace and Rebello (1993) contend that the voluntary purchase of insurance helps to reduce the information asymmetry (agency) costs that debtholders face in screening borrowers' creditworthiness *ex-ante* and monitoring their contractual compliance *ex-post*. Additionally, Doherty (2000b) suggests that hedging through insurance can reduce the level of business risk for a company and thus decrease the value of the default put option held by shareholders. Consequently,

distortions in investment decisions resulting from the asset substitution and underinvestment problems can be reduced by purchasing insurance. In this way, the purchase of property insurance can also act as an important signalling device about the quality of the future financial condition of firms and so help them to reduce their market cost of capital (Bessembinder, 1991). Moreover, the higher the degree of corporate leverage the greater the likelihood that debt default will result from cash flow volatility and the more valuable the default put option to shareholders (Doherty, 2000a). Therefore, the underinvestment problem is likely to be more acute in highly levered firms given a fixed level of investment opportunities (Nance et al., 1993). Indeed, prior studies (e.g., Mayers and Smith, 1990; Berkman and Bradbury, 1996; Core, 1997; Hoyt and Khang, 2000) find evidence supporting this contention. Consequently:

Hypothesis 3a: Highly levered companies are more likely to purchase property insurance than lowly levered companies (ceteris paribus).

Hypothesis 3b: If property insurance is purchased, highly levered companies are likely to purchase greater amounts than lowly levered companies (ceteris paribus).

4.2.4 Investment Opportunity Set (IOS)

Myers (1977) views the traded value of the modern firm as a combination of the value of tangible assets-in-place and (the present value of) profitable growth/investment opportunities whose value depends on future investment by managers[51]. The nature of a firm's IOS can affect the agency conflict between the firm's debtholders and shareholders (Smith and Watts, 1992; Nance et al., 1993; Berkman and Bradbury, 1996). For example, Smith and Watts (1992) and Gaver and Gaver (1993) argue that relative to firms with a low IOS, firms with a high IOS are riskier in that they invariably give managers more discretion over investment decisions. Indeed, Chung and Charoenwong (1991) find evidence that the more

[51] Smith and Watts (1992) interpret more growth options as greater access to positive net present value projects. They opine that firms with more growth options tend to have fewer assets-in-place. In contrast, Gaver and Gaver (1993) argue that the IOS is a broad concept and that virtually any discretionary expenditure item could be viewed as a growth option.

growth opportunities a firm has, the larger the portion of traded value represented by growth options and the higher its equity risk. Smith and Watts (1992) also suggest that as the proportion of a firm's total value represented by growth opportunities (as opposed to assets-in-place) increases, the tangibility/observability of managerial actions would decrease. This calls for more effective monitoring by shareholders and/or the adoption of incentive contracts that sufficiently motivate managers to act in owners' interests. In either case, insurance can be an effective mechanism *vis-à-vis* other means (e.g., costly external auditing) in monitoring opportunistic managerial behavior (Skogh, 1991; Grillet, 1992a; Main, 2000) and in shaping effective incentive-based schemes (Han, 1996; Sung, 1997; Doherty, 2000b). Additionally, intangible growth/investment opportunities are only valuable when a firm remains a going concern. As such, their value will drop dramatically if the firm faces bankruptcy, which suggests that the expected costs of financial distress for firms with greater growth opportunities are likely to be higher (e.g., see Myers, 1984; Williamson, 1988; Harris and Raviv, 1990). Larger expected costs of financial distress, in turn, imply an increasing need to use property insurance to mitigate the risk of financial distress in high growth firms. Thus, the above reasoning combines to suggest that managers of companies with more growth options are expected to have greater incentives to purchase insurance than their counterparts in low growth companies.

Stulz (1990), Shapiro and Titman (1986) and Froot et al. (1993) also posit a strong link between cash flow and investment in firms with a large IOS given market imperfections (e.g., information asymmetries)[52]. They argue that when firms' cash flows are low, obtaining external financing could become costly enough to force firms to scale down value-increasing investments. Thus, the underinvestment problem is likely to be particularly severe in firms with high growth options (Nance et al., 1993; Mian, 1996). Corporate hedging (e.g., through insurance), however, can reduce the variance of cash flow and so helps to avoid a shortfall in cash flow that could trigger a costly resort to the capital markets and/or a scaling down of investment in positive net present value projects (Froot et al., 1993). In this way, the purchase of property

[52] A reason why raising external finance by companies with a large IOS could be costly is that there appears to be more asymmetric information about the quality of new projects between outside investors and managers (Myers and Majluf, 1984). Further, growth options also do not normally provide good collateral for lenders of financial capital such as banks (Titman and Wessels, 1988).

insurance could provide post-loss financing at an *ex-ante* fixed cost (i.e., at a given rate of premiums), thereby enabling managers to continue value-increasing investments following a major accidental loss (Tufano, 1996; Core, 1997). Indeed, the results from several prior studies (e.g., Nance et al., 1993; Berkman and Bradbury, 1996; Gay and Nam, 1998; Hoyt and Khang, 2000) support this view. Hence:

Hypothesis 4a: Companies with high growth opportunities are more likely to purchase property insurance than companies with low growth opportunities (ceteris paribus).

Hypothesis 4b: If property insurance is purchased, companies with high growth opportunities are likely to purchase greater amounts than companies with low growth opportunities (ceteris paribus).

4.2.5 Company Size

Chung (1993) argues that large firms may have lower agency costs associated with the asset substitution and the underinvestment problems than small firms. This is because large firms normally have a more diffuse ownership structure comparing to small firms and hence the possibility of exploiting debtholders' wealth by shareholders is likely to be less. This line of reasoning suggests a decreased incentive/need for managers in large companies to purchase property insurance to mitigate agency conflicts between owners and debtholders.

The corporate purchase of insurance may also be motivated by the desire of managers to benefit from the efficiencies provided by the (real) services of insurance companies (e.g., Mayers and Smith, 1982, 1990; Hoyt and Khang, 2000; Main, 2000). These real service benefits derive from insurers' expertise in risk pricing and loss prevention; their specialization in writing, monitoring and enforcing contingent contracts; the comparative advantages in loss adjustment and claims handling; and economies of scale in risk pooling (Grillet, 1992a). Indeed, Shapiro and Titman (1986) interpret the corporate motivation for purchasing insurance as taking advantage of insurance companies' efficiency in claims processing and risk-bearing,

amongst other benefits. A typical example of this is the existence of "claims only" insurance polices where the insured bears the risk elements of the policy while the insurer provides claims management and other advisory services (Mayers and Smith, 1986). Also, combining insurance coverage with loss-prevention services (as is often the case with many commercial insurance policies) helps to guarantee the quality of such real services (Mayers and Smith, 1986). Mayers and Smith (1990) argue that insurers' services are likely to benefit small companies more than large companies as the former often have limited financial capacity and generally lack risk management expertise. Additionally, the non-proportionate direct cost of financial distress implies that the purchase of property insurance is relatively more attractive to small companies than large companies (Mayers and Smith, 1982). Mian (1996) further notes that the fixed costs associated with capital market visits are likely to make financing relatively more expensive for smaller firms. This suggests that small firms are more likely to hedge via insurance than large firms. In addition, insurance can act as an important signal for prospective investors of small companies concerning their future financial prospects.

However, some studies (e.g., Nance et al., 1993; Berkman and Bradbury, 1996; Mian, 1996) find contrary evidence suggesting that large companies are more likely to hedge than small companies (in derivatives trading). They attribute this evidence to the high information and transaction cost scale economies that exist in the hedging activities such as derivative trading. Nonetheless, Mayers and Smith (1990) argue that this relation is unlikely to persist in the transactions of property/liability insurance where similar scale economies may be less pronounced. Indeed, several insurance studies (e.g., Mayers and Smith, 1990; Yamori, 1999; Hoyt and Khang, 2000) report evidence that small companies tend to purchase relatively more insurance than their larger counterparts. Therefore:

Hypothesis 5a: Small companies are more likely to purchase property insurance than large companies (ceteris paribus).

Hypothesis 5b: If property insurance is purchased, small companies are likely to purchase proportionately greater amounts than large companies (ceteris paribus).

4.3 INTERACTION EFFECTS

In this section, possible interaction effects between key variables are examined.

4.3.1 Interaction Between Managerial Ownership and Leverage

The linkage between managerial ownership and the corporate purchase of insurance can be moderated by the level of leverage (Brewer, 1995; Knopf and Teall, 1996; Downs and Sommer, 1999). With high leverage, the asset value of the firm (i.e., the underlying assets of the default put option held by shareholders) is close to the face value of debt (i.e., the striking price of the put option) (Furlong and Keeley, 1989). Therefore, shareholders can benefit more from engaging in risk-taking activities when a company is highly levered since the value of default put option held by shareholders tends to appreciate with risk. Following this line of reasoning, Downs and Sommer (1999) argue that if the interests of shareholders and managers are aligned by managerial share ownership, company managers in highly levered companies are likely to be motivated to engage in risk-taking rather than risk-hedging. In other words, the relation between managerial ownership and corporate hedging is expected to be negative and the magnitude of this linkage should increase with the level of leverage. As a result, a multiplicative interaction term between managerial ownership and leverage is likely to have a negative influence on the corporate purchase of property insurance. Another line of reasoning raises doubts about whether the interests of shareholders and managers can be aligned effectively by managerial share ownership, particularly when the level of insider shareholding is low. As a result, managerial interests can diverge from that of shareholders (a feature referred to as *managerial entrenchment*). For example, company managers may be primarily concerned with the value of their human capital and job security rather than the maximization of shareholders' wealth (Smith and Stulz, 1985). The *managerial risk-aversion* hypothesis thus predicts a positive relation between managerial ownership and corporate hedging insurance. Also managerial risk aversion is hypothesized to increase with leverage because the risk of financial distress is growing as indebtedness increases. Consequently, the magnitude of the positive linkage between managerial ownership could increase as company leverage increases. As such, the

theoretical prediction of the influence of the (multiplicative) interaction term between managerial ownership and leverage is not clear from the extant literature. Nonetheless, as analyzed earlier in section 4.2.1, the generally low level of managerial share ownership is unlikely to effectively motivate Chinese company managers to act in the interests of shareholders. Therefore, consistent with the hypothesis of managerial ownership, I expect a multiplicative interaction term between managerial ownership and leverage to have a positive influence on the corporate purchase of property insurance.

4.3.2 Interaction Between Managerial Ownership and Company Size

Hoyt and Khang (2000) argue that the relation between managerial ownership and corporate hedging could also be moderated by company size. More specifically, they contend that for a given level of insider shareholdings, managers tend to become more risk averse as firm size declines. This is because managers of large companies are likely to be able to more effectively diversify their human capital and so reduce the risk of job security than managers of small firms. As a result, the linkage between managerial share ownership and corporate hedging through insurance could decrease in magnitude as the company size increases. In other words, a negative relation is expected to exist between the multiplicative interaction of managerial ownership and company size and corporate hedging through property insurance.

4.3.3 Interaction Between Leverage and Investment Opportunity Set

Many prior studies examining corporate capital structure have documented a negative relation between leverage and firms' growth options (e.g., see Smith and Watts, 1992; Gaver and Gaver 1993; Lang, Ofek and Stulz, 1996). This is because management tends to choose leverage levels based on its private information about future firm growth (Myers, 1977). Specifically, managers of firms with valuable growth opportunities would choose lower leverage because equity financing can help to control for the potential underinvestment problem associated with risky debt. Therefore, leverage and corporate growth options could interact each other and exert a conjoint influence on corporate hedging (e.g., Smith and Watts, 1992; Hoyt and Khang, 2000). Indeed, this is the case with the current data sample (see Table 6.3).

Sections 4.2.3 and 4.2.4 explain that when analyzed separately, both leverage and growth options are expected to be positively related to corporate hedging. However, the predicted negative relation between leverage and growth options could confound their respective effect on the corporate purchase of property insurance. To examine the possible conjoint effects of leverage and growth opportunities on managers' decision to purchase property insurance in the Chinese corporate sector, I include a multiplicative interaction term between leverage and growth options. However, the expected direction of such influence on the corporate purchase of property insurance is ambiguous.

4.4 CONTROL VARIABLES

In this section seven non-agency-theory-based factors that might influence the purchase of property insurance by Chinese publicly listed companies are considered.

4.4.1 Systematic and Unsystematic Risks

Doherty (1997) argues that companies are likely to have different levels of systematic risk because they have variable cross-sectional exposures to physical assets loss arising from property risks, environmental hazards, and so on. Indeed, some physical asset-based risks (e.g., regional property damage arising from earthquakes or floods – say on China's densely populated East coast) could have a direct adverse impact on movements in the market value of companies. On the other hand, as section 2.4.1 makes clear, Chinese investors' portfolios are likely to possess a high degree of unsystematic as well as systematic risks (Zhang, 1998). However, the lack of developed domestic derivative and captive insurance markets in the PRC thus suggests that publicly listed companies are likely to seek commercial insurance solutions to mitigate their systematic and unsystematic risks (Karmel, 1996; Adams and Hillier, 2000). In this study, the possible influences of systematic and unsystematic risks on the corporate purchase of property insurance are therefore controlled for.

4.4.2 Industry Type

Industrial sector might also be a factor that influences the managerial decision to purchase property insurance as business risk may vary between industries and/or because of the existence of different cross-industry regulations (Mayers and Smith, 1982; Hoyt and Khang, 2000). For example, Mayers and Smith (1982) predict that companies operating in a highly regulated industry (e.g., utilities) would tend to purchase more insurance than those entities operating in a relatively unregulated industry (e.g., retailing). This might be because industry regulators have public reputation protection-based incentives to compel companies to take out insurance in order to mitigate business risks (e.g., bankruptcy) and thereafter shift the transaction costs of hedging onto customers through market price rises. Mian (1996), however, argues that managers of firms in regulated industries are likely to have less discretion in their choice of investment policies; moreover, regulation could also makes it easier for debtholders to control aberrant managerial action *ex-post*. As a result, firms in regulated industries are likely to face lower contracting costs and so have less motivations to hedge through insurance than firms in less regulated sectors. Additionally, Hoyt and Khang (2000) contend that State-induced price controls might also help to reduce company risks thereby lowering managers' propensity to engage in insurance. Indeed, in the PRC, some sectors - notably the utilities industries (including water, electricity and gas) - are strictly price-regulated and protected by the State against business risks associated with free market competition. As such, managers in the PRC-based utility companies may not have sufficient incentives to hedge property risks through the purchase of insurance. Thus far prior empirical evidence on this possibility is inconclusive. For instance, Mian (1996) and Hoyt and Khang (2000) find that regulated utilities hedge less; in contrast, Core (1997) and Yamori (1999) find evidence to the contrary. Therefore, the influence of regulatory status on the corporate purchase of property insurance is an open empirical question.

Chen and Jiang (2000) report that in the PRC many manufacturing companies tend to be both more competitive than entities operating in other industries (e.g., utilities and real estate) and less diversified than conglomerates. Consequently, the need for managers of PRC-based manufacturing companies to hedge business risks via the purchase of property insurance might be greater than that of managers working

in other industries. The service firms in the current sample are mainly retailers. They might face severe asset-loss risk and thus have a greater propensity to purchase property insurance than other firms as they often have a large proportion of their assets as inventories and many of these firms often operate in a single business location (Hussain and Zhuang, 1997). In contrast, managers of real estate and conglomerate firms are likely to have less incentives to purchase property insurance because the former often has less insurable assets than firms in other industries, while the latter will probably be able to diversify their business risk by entering into multiple lines of business.

4.4.3 Geographical Location

As mentioned earlier in section 4.4.1, systematic/unsystematic risks (and hence the corporate purchase of property insurance) could vary across geographical regions. Additionally, Sun et al. (1999) report that the coastal areas of China have been more successful in attracting foreign capital than internal regions because they enjoy a preferential investment status under the State's current economic reform programme. As a result, industry commentators (e.g., Shi and Su, 2000) argue that the risk management awareness of company managers in China's economically more developed coastal zones is likely to be greater than elsewhere. This implies that managers of companies located in China's Eastern coastal regions are more likely to use property insurance than their counterparts in companies operating elsewhere in the country. However, the literature is not clear as to whether locational factors will influence the financial extent of property insurance. As such, geographical location is used as a selectivity bias identifier variable in the probit insurance participation decision model (e.g., see Ireland and Lennox, 2002).

4.4.4 Foreign Ownership

Foreign share ownership might also influence corporate insurance decisions. Companies with substantial foreign capital are more likely to procure property insurance than solely domestic-owned companies in order to alleviate the increased business risks associated with investing in a new and developing market (e.g., due to inadequate fire controls and safety procedures) (Falush, 1996). Lee and Rui (2000)

further report that compared with domestic investors, foreign investors are more likely to incur high information acquisition and assessment costs – for example, due to the different legislative and regulatory frameworks in the host country. These information asymmetries could thus motivate the managers of foreign-invested companies to purchase more property insurance than their counterparts in wholly domestic-owned companies.

4.4.5 Tax

The tax-induced explanation for corporate hedging holds that hedging can reduce the expected tax liability for a firm facing a convex effective tax schedule by reducing the volatility of the firm's expected taxable income stream (e.g., see Mayers and Smith, 1982; Main, 1983; Smith and Stulz, 1985). The convexity of effective tax schedule often results from both the statutory progressivity (e.g., in the US) and the presence of tax preferential items (e.g., tax-loss carry-forwards and investment tax credits) (e.g., see Nance et al., 1993; Mian, 1996). Main (1983) further shows that additional tax benefit can arise from the involuntary conversions/replacement of destroyed assets following an insured loss providing that the tax rate accruing to the involuntary conversion is less than that of corporate profit tax[53].

China does not have a (statutory) progressive corporate income tax schedule (Wang, 1999). The tax code, however, allows a maximum of five-year carry-forwards of the tax-loss arising from operating losses. Therefore, the effective tax schedule of firms with tax-loss carry-forwards can be somehow convex. These companies are likely to purchase property insurance to reduce the variability of their taxable income and maximize the present value of their tax shields (i.e., accumulated operating losses) (DeAngelo and Masulis, 1980; Berkman and Bradbury, 1996; Mian, 1996). Additionally, the tax code treats some types of companies (e.g., foreign-invested companies and government approved high-tech companies) favorably by allowing some tax exemptions or rebates. For example, the newly foreign-invested companies

[53] This additional tax benefit is equal to the insurance settlement less the book value of the asset at the time of loss multiplied by the difference between the corporate income tax and the tax rate applicable to this difference. Therefore, if the latter rate is lower than the former, additional tax benefits will arise (Main, 1983).

are exempt from tax for the first two operating years and are subject to a tax rate of 15 percent for three operating years thereafter. These tax concessions constitute a kind of "tax shield" for the companies involved. The purchase of property insurance can help to reduce the downside risk of taxable income stream and thereby enable companies with tax concessions to make full use of their tax shields. In this study, I control for the effects of both tax-loss carry-forwards and tax concessions on the corporate purchase of property insurance (see Chapter 5, section 5.4.3).

4.4.6 Hedging Substitutes

Instead of managing risk exclusively through insurance contracts, firms could pursue diversification strategies and/or adopt conservative financial policies (e.g., maintaining high liquidity) that substitute for insurance strategies (Smith and Stulz, 1985; Merton, 1993; Nance et al., 1993). Risk diversification can be achieved at the level of inter-company diversification (e.g., through mergers and acquisitions) and/or intra-company diversification (e.g., by entering different lines of business). However, few publicly listed Chinese companies in the current sample have experienced material asset reorganizations over the research period 1997-99 (see Chapter 5, section 5.3). As a consequence, cross-sectional differences in inter-firm-level diversification are unlikely to affect substantially companies' hedging strategies. Additionally, the unavailability of segmental accounting information in the Chinese corporate sector inhibits the analysis of intra-company diversification. The conservative financial policies that a firm could employ to substitute for the purchase of property insurance include high liquidity, low payout ratio of cash dividends, the use of convertible debt and preferred shares in the capital structure (Nance et al., 1993). Indeed, the results from prior studies (e.g., Nance et al., 1993; Berkman and Bradbury, 1996; Mian, 1996) support the substitutive relation between conservative financial policies and hedging via derivatives. However, according to the CSRC database (2000), convertible debt and preference shares are rarely used by Chinese publicly listed companies. Additionally, Peng (1999) and Gao (2000) report that most Chinese listed companies often prefer to use stock dividends and rights offerings rather than cash dividends as the major means of wealth distribution to shareholders. Therefore, it is unlikely that cross-sectional differences in corporate (cash) dividend policies will affect substantially the corporate property insurance decisions in Chinese

publicly listed companies. Nevertheless, as Chapter 1 (see section 1.3) notes, it is considered useful to investigate the extent to which the level of corporate property insurance purchases substitutes for (or complements) other loss recovery mechanisms, such as State funding. Therefore, this study controls for the possible influences of government subsidies and liquidity on the corporate purchase of property insurance (see Chapter 5, section 5.4.3).

4.5 CONCLUSION AND SUMMARY

Drawing a framework from agency theory, this chapter argues that variations in the corporate purchase of property insurance by Chinese publicly listed companies could be explained by differences in agency conflicts that manifest themselves through differences in firm-specific characteristics. In this regard, five testable hypotheses representing important constructs of agency theory – namely, managerial share ownership, State ownership, leverage, investment opportunity set and company size - are put forward in this chapter in order to facilitate empirical testing. Additionally, other factors (three interactive items and seven control variables) that might influence the corporate purchase of property insurance are identified in this chapter and tested in Chapter 6. The next chapter of this thesis discusses the research design of the study, including a description of data, the definitions of variables used, and the models employed.

CHAPTER 5: RESEARCH DESIGN

5.1 INTRODUCTION

This study uses statistical analysis methods to test empirically the five main hypotheses (and control variables/interactive terms) put forward in Chapter 4. This chapter discusses the rationale for such an approach and considers the manner in which it is implemented in this research project. The chapter also describes the data used in this study, defines and measures the variables, and specifies the models employed.

5.2 SELECTION OF RESEARCH METHOD

5.2.1 Statistical versus Field-based Methods

Among the battery of research methods, three – namely, statistical analysis, mail survey questionnaires and interviews - could potentially be used in order to achieve the stated aims of this study set forth in section 1.2[54]. Statistical analysis is essentially a quantitative approach, while the latter two field-based methods can promote both quantitative and qualitative analyses (Sarantakos, 1993). Table 5.1 summarizes the relative strengths of employing statistical techniques and field-based research through interviews and/or mail survey questionnaires. Statistical analysis is often adjudged by researchers to be "scientific" and appropriate for testing hypotheses drawn from a body of theory (i.e., using deductive reasoning). Additionally, statistical results are considered to be capable of generalization and reproduction, and thus more defensible than other research methods (Watts and Zimmerman, 1990; Sarantakos, 1993). In contrast, the data collected from mail survey questionnaires and/or personal interviews, for example, often suffer from response bias and measurement errors (Snow and Thomas, 1994). Moser (1968) also notes that mail survey questionnaires

[54] Case study and other observation techniques may also provide useful details on the insurance purchasing practices of individual companies (e.g., managerial perceptions). However, such methods typically lack cross-sectional variation and generalization qualities that are required in order to test rigorously the explanatory power of theories such as those concerning corporate hedging (Tufano, 1996).

Table 5.1

Key Characteristics of Statistical Analysis, Mail Survey Questionnaires and Interview Techniques

This table summarizes the important features of three commonly used methods in business research. The key advantages and limitations of each method are also summarized in the table.

Technique	Purpose	Main Attributes	Approach	Key Advantages	Key Disadvantages
• Statistical Analysis	· Description · Inference · Explanation · Prediction	· Quantitative · Hypothesis testing	· Computational · Analytical	· Scientific · Cost-efficient · Replicable · Generalizable	· Ignores the nature and impact of unique events (or outliers) which may be of research interest · Does not give a "rich picture" of phenomenon under investigation
• Mail Survey Questionnaires	· Description · Illumination	· Qualitative or Quantitative · Interpretative	· Documentary · Interpretative	· Time/cost-efficient · Illuminating	· Possible low response · Non-response bias · Response bias/error · Not suited to multi-purpose studies · May require formal approval in State-controlled environments
• Interviews	· Description · Illumination	· Mainly qualitative · Interpretative · Naturalistic	· Discursive · Interpretative	· Illuminating · Discoverability	· Response bias/error · Non-replicable · Often time-consuming · Non-generalizable · May require formal approval in State-controlled environments

Source: Derived from Moser (1968); Jick (1979); Patton (1990), Sarantakos (1993)

may also be afflicted by non-response bias. However, these field-based techniques can furnish a more detailed and in-depth picture of the phenomenon under investigation than statistical techniques if their application is managed well (Patton, 1990; Sarantakos, 1993). Therefore, supplementing statistical analysis with one or more field-based methods would be ideal if it could assist in providing additional explanations and understanding of the corporate insurance decisions in the PRC. However, data access limitations, together with the time and cost constraints, preclude the application and use of supplementary field-based techniques, such as mail survey questionnaires or personal interviews, in this study. Some China-specific constraints that arise in field-based research are outlined briefly in section 5.2.2 below.

5.2.2 Institutional Constraints in China

There are two main constraints affecting the application and use of field-based research methods in China. First, Roy, Walters and Luk (2001) report that statutory/regulatory constraints - for example, the requirement to obtain authorization from the relevant authorities prior to undertaking research work in locations and/or contexts that might be deemed to be politically sensitive - are important factors that greatly hamper the use of field-based research methods in State-controlled economies like the PRC. Indeed, in August 1999, China's State Statistical Bureau (SSB) issued a regulation that legally restricts formal field-based data collection to those users (e.g., market research and consulting companies) that are licensed by the SSB. Though the intent of this regulation is not clear, it can nonetheless hinder individuals from collecting data from PRC-based companies by means of mailed questionnaires and/or personal interviews[55]. Second, various socio-cultural features and traditions in China also constrain the use of field-based methods. For instance, Whitley (1992) notes that business systems in China are embedded in social and cultural settings that differ substantively from those of the Western economies. Indeed, while recent economic changes have influenced the ways of conducting business in China, many company managers are still unfamiliar with interviews and/or surveys-based data collection methods and often take a cautious, if not suspicious, attitude towards them (e.g., Roy et al., 2001). Roy et al. (2001) also report that many Chinese managers fear that

[55] Source: *People's Daily* (in Chinese), 2nd August 1999, p.2.

outsiders may uncover sensitive commercial information and that this feeling leads to a lack of co-operation or more commonly, a declination to participate in surveys/interviews carried out by outsiders. Other institutional factors noted by Roy et al. (2001), such as the regional diversities, a relatively high level of illiteracy, infrastructure inadequacies (e.g., regarding the national mail system), also pose potential difficulties to the successful implementation of field-based work in China. For these reasons, the use of field-based research techniques in the present study is deemed not to be feasible.

5.2.3 Advantages of Statistical Methods

In view of the above constraints, this study employs statistical analysis as the preferred empirical research method. The rationale for undertaking this approach is further motivated in two respects. First, hypotheses regarding the corporate purchase of property insurance can be efficiently and effectively tested using statistical techniques. Also, it is considered that the results generated from the statistical analysis of variations in the corporate purchase of property insurance by publicly listed Chinese companies can be more readily generalized to other non-sampled Chinese companies. Hence, the results of this study are considered to have wider academic and commercial appeal. Second, the use of accounting information from audited company accounts can help to minimize biases (e.g., response bias) and error (e.g., due to mis-measurement) that can sometimes afflict field-based data collection. This attribute thus helps to ensure that the results generated from the statistical analysis of data are robust and efficient (e.g., see Mian, 1996).

5.3 DATA DESCRIPTION

From the 745 companies listed at the SHSE and SZSE at the end of 1997, 87 companies that experienced material asset reorganizations between 1997-99 are excluded as it is felt that such activity could distort the interpretation of the results[56].

[56] In order to avoid the effect of structural changes before and after listing, each company in the sample has to be listed for two full accounting years during the research period (1997-99). The most prevalent forms of corporate structural reorganization in China include asset swaps and divestitures among associated companies. The materiality of such asset reorganization is determined in this study by

Additionally, six financial services companies (e.g., banks, investment companies) are not included in the research sample because they account and report under different rules from other companies and are active in the trading of risk management services. Moreover, 17 companies with dual listing status at both the SHSE/SZSE and the HKSE are also excluded in order to avoid the potentially confounding effects that institutional differences (e.g., with regard to legislation and degree of financial market development) could have on the empirical results (e.g., see Naser and Wallace, 1995). I then identified ninety-six companies that disclosed annual property insurance spending in their annual financial statements during 1997-99. A telephone-based survey was also conducted to obtain information on the discretionary property insurance spending from Financial Directors/Treasurers in the remaining 539 companies. This survey used a simple instrument developed with the assistance of a SSB approved user (see Appendix) and resulted in 146 responses[57]. A further seven companies with missing annual accounting data had to be excluded, resulting in cross-sectional/time-series panel data for 235 non-financial companies (approximately 32 percent of the population over the period of analysis)[58]. The period 1997-99 represents the earliest and latest years for which complete data were available at the time the study was carried out. Firm-specific non-insurance accounting data are obtained from the *Genius Securities Information Database* (GSID) and the *Hong Kong & Macao Securities Information System* (HKMSIS). In addition, measures of systematic risk (i.e., betas) are computed from financial markets information supplied by the *Huaxia Yirong Securities Information System*. Data on the GSID and the HKMSIS are derived from the audited annual financial statements of PRC-based publicly listed companies and so are assumed to be reliable (see Chapter 1, section 1.5.1). Furthermore, the share price data used in the calculation of company betas are adjusted for dividends, rights offerings and share splits over the period 1997-99 in order to make the time-series data more comparable. Finally, to eliminate variations

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applying the official criteria laid down by the CSRC – i.e., more than 30 percent change in the value of physical assets.

[57] The instrument only elicited financial information on annual corporate insurance spending. It was checked and piloted with the assistance of a China-based financial consulting firm. However, this instrument did not constitute a full questionnaire survey under the current SSB rules and as such, it did not infringe Chinese statutory requirements.

[58] The data set is an unbalanced panel of 668 company/year observations comprising 203 cases in 1997, 234 cases in 1998 and 231 cases in 1999.

due to annual price changes, all monetary values are adjusted by China's retail purchase index (RPI) (base year = 1997).

To examine the extent to which the sample of companies is representative of the population, I also collected data on company size and leverage for companies not included in the current sample. I then conducted a Mann-Whitney U-test to compare the medians of size and leverage between the sample companies and the non-included companies year by year (see Chapter 6, Table 6.1 Panel B). Clearly, no statistically significant differences in company size and capital structure were found between these two groups in two-tailed tests. However, it is not possible to obtain information on other firm-specific financial and operational characteristics (see section 5.4.2) for the non-included companies. Nonetheless, the average and median of State ownership in the current sample are both about 30 percent (see Chapter 6, Table 6.1 Panel A), which is similar to the reported average level of State shareholding for all companies listed at the SHSE and SZSE (CSRC database (2000)). Therefore, it appears that the ownership structure of the sample companies is representative of the total population.

5.4 VARIABLES AND PROXIES

5.4.1 Dependent Variables

In this study, two dependent variables are used in multivariate regression analyses. The first dependent variable (*INSCHO*) is a dummy that takes the value one if a company purchases property insurance in a certain year and zero otherwise. The second dependent variable (*INS*) is a continuous variable that denotes the financial extent of property insurance use by companies. *INS* is defined as the annual corporate spending on property insurance scaled by the total book value of insurable physical assets (which include buildings, plant, equipment and so on).

5.4.2 Independent Variables

The independent variables representing the main constructs of agency theory framework used in this study are as follows:

(1) Managerial Share Ownership (*MAN*)

As in Core (1997), Hoyt and Khang (2000) and Chen et al. (2001), managerial (inside) share ownership is measured by the fraction of the year-end value of total ordinary shares owned by company managers relative to the total value of shares in issue.

(2) State Ownership (*STATE*)

As in Gul (1999), the year-end proportion of the value of ordinary shares held by the State to the total value of ordinary shares in issue is used as a proxy for the State ownership.

(3) Leverage (*LEV*)

In the finance literature, leverage is commonly measured in two ways - the ratio of debt to equity/total assets (e.g., Yamori, 1999; Hoyt and Khang, 2000) and the ratio of financial expenses (i.e., interest) to earnings before interest and tax (EBIT) (e.g., Nance et al., 1993; Yamori, 1999). The interest-to-EBIT ratio could vary according to the fluctuations in the annual earnings of companies even when the debt policy remains unchanged. Therefore, the interest-to-EBIT ratio could be a "noisy" measure for financial leverage as it may also proxy for changes in companies' business risk profile. For this reason, only the debt-to-equity ratio is employed as the measure of financial leverage in this study. Both the book value and the market value of total assets can be used in constructing the debt-to-equity ratio. Given the nascent and volatile securities markets in the PRC (Karmel, 1996; Xu and Wang, 1999), I define the debt-to-equity ratio as the year-end total (long and short-term) debt divided by the book value of equity as the leverage measure.

(4) Investment Opportunity Set (*GROW*)

Market-based measures of a firm's investment opportunity set (IOS) often include the ratio of market-to-book value (e.g., Hoyt and Khang, 2000), Tobin's Q

(e.g., Gay and Nam, 1998), the ratio of research and development expenses (R&D) to firm value (e.g., Berkman and Bradley, 1996), and the price-earnings ratio (P/E ratio) (e.g., Berkman and Bradley, 1996). This study could not use R&D as an IOS measure because under existing accounting rules there is no requirement for this item to be disclosed in the annual reports of PRC-based publicly listed companies. Also, R&D expenditure may be an imprecise measure of a firm's IOS as it might proxy for costly external financing and/or financial distress costs (Froot et al., 1993; Gay and Nam, 1998). The P/E ratio is also considered to be inappropriate in this study because it can be distorted by small earnings. As in Gay and Nam (1998), this study therefore uses Tobin's Q to capture the IOS of firms. Tobin's Q is defined as the ratio of the sum of the book value of debt and market value of equity to the replacement cost of the firm's assets. To avoid the difficulties often associated with computing replacement costs noted in Lang et al. (1996) (e.g., due to the lack of replacement cost information), the approximate value of Q recommended in Chung and Pruitt (1994) is used. That is, Q = (MVE+PS+DEBT)/TA, where MVE is the product of a firm's share price and the number of common shares in issue; PS is the liquid value of a company's preference shares; DEBT is the book value of long-term debt plus short term liabilities; and TA is the book value of total assets. Since Chinese companies do not issue preference shares, the approximate value of Q is, in essence, equal to the market-to-book value ratio [59]. On the other hand, Pilotte (1992) argues that accounting-based indicators such as percentage growth in total assets and earnings could be used as *ex-post* proxies for IOS. However, Chung and Charoenwong (1991) contend that the essence of growth is not the expansion of assets and earnings but the existence of profitable investment opportunities. Therefore, an entity is not a growth firm merely because its assets and earnings are growing over time. As such, only the

[59] As Chapter 2 (section 2.2.3.2) makes clear, A-shares and B-shares are openly traded in China, but large blocks of equity held by the State and institutional investors (roughly 60 percent of total shares issued) are not openly and freely traded in order to avoid excessive volatility in local markets. Rather, these large blocks of equity can be transferred between parties through negotiation subject to the approval from the CSRC. The common practice is for such share interests to be exchanged at a price based on the RMB value of net assets per share plus a margin for traders' profit and expenses. Therefore, the market value of the equity of Chinese publicly listed companies can be substantially overstated using the figure of total shares in issue multiplied by the price of tradable A-shares and/or B-shares. In order to address this problem and as an improvement on Xu and Wang (1999), this study calculates the market value of equity as the sum of market value of tradable A-shares and/or B-shares plus the product of non-tradable shares and the year-end RMB value of net assets per share. As in Gaver and Gaver (1993), the average monthly price of tradable A-shares and/or B-shares are used in this study.

market-based measure of investment options (approximate Tobin's Q) is used in this study.

(5) Company Size (*SIZE*)

As in prior insurance-related studies (e.g., Hoyt and Khang, 2000), the (year-end) book value of total assets is used to represent company size. The natural logarithm of total assets is applied to reduce the potentially confounding effect of extreme values and mitigate potential heteroscedasticity.

5.4.3 Control Variables

In order to control for non-agency-theory-based factors that might influence the corporate purchase of property insurance, three interaction terms and seven control variables are used in this study and they are defined as follows:

(1) Interaction Terms (*LEVMAN*, *SIZEMAN* and *LEVGROW*)

Three multiplicative interaction terms – *LEVMAN* (i.e., *MAN***LEV*), *SIZEMAN* (i.e., *MAN***lnSIZE*) and *LEVGROW* (i.e., *LEV***GROW*) are included in the empirical models to capture the possible interaction effects between corresponding variables. However, Gordon (1986) notes that because multiplicative interaction terms often exhibit strong correlations with the component parts, the introduction of interaction terms could lead to high levels of multicollinearity in the regression models. To overcome this econometric problem, I employ the procedure recommended by Jaccard, Turrisi and Wan (1990). That is, for those components of the interaction terms, I first "center" these variables by subtracting their means from them before constructing the multiplicative interaction terms. The centered form of corresponding component variables is then used in the regression analysis. For example, for the interaction term between managerial ownership and leverage, I first center managerial ownership and leverage by subtracting their means. Then I computed the product of these centered variables as the multiplicative interaction effect. Such a "centering" transformation effectively reduces the correlation between the product terms and the component parts of the interactive effects.

(2) Corporate (Systematic (*SYS*) and Unsystematic(*UNSYS*)) Risks

Systematic risks (also referred to as non-firm-specific risks) are risks common to individual companies while unsystematic risks are risks specific to individual companies. By definition, unsystematic risks can be diversified by managing a balanced investment portfolio, whereas systematic risks are non-diversifiable (Coperland and Weston, 1992). Systematic risks that could lead to loss in physical assets might include regional floods, earthquakes and other environmental hazards. In contrast, unsystematic risks can relate to physical assets loss due to events like fire or theft.

In this study, systematic risk is measured by company beta (β_{is}) (s = 1997-99)[60]. This beta for company i in year s is computed by regressing the (monthly) total risk premium of company i on the (monthly) market risk premium in the manner prescribed by Berndt (1991, pp. 34-35) as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_{is} (R_{Mt} - R_{ft}) + \varepsilon_{it} \qquad [5.1]$$

In equation [5.1], R_{it} and R_{Mt} are the respective monthly return on the shares of company i and the market portfolio in period t (t = months 1-12 in year s)[61]. R_{ft} is the risk-free rate of return, as measured by the interest rate of three-month bank savings; α_i is the constant and ε_{it} is an error term, reflecting the effects of specific (unsystematic) risk[62].

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[60] In the PRC, share price volatility varies between shares held by domestic investors (i.e., A-shares) and those held by foreign investors (i.e., B-shares). The beta values for the 50 or so companies that issue both A-shares and B-shares in the period of analysis are computed from the monthly returns on the two types of shareholdings weighted by the proportion of registered equity capital. The SHSE and SZSE A-share indices are chosen as the market portfolio for A-share companies in these two markets, respectively. Also, the SHSE and SZSE composite indices (which include both A-share and B-share companies) are chosen as the market portfolio for B-share companies in the two markets.

[61] Due to the high cost and time involved in the collection of daily/weekly trading data, monthly share return data had to be used. As in Borde, Chambliss and Madura (1994), a beta for each company/year is computed using 12 months' market data.

[62] In the finance literature, returns on short-term Treasury Bonds are usually used as a measure of the risk-free rate of return. However, such measures are not available in the PRC due to the fact that government-issued treasury bonds are normally for mid-term or long-term (typically three to five

Unsystematic risk ($UNSYS_{is}$) is calculated as in Copeland and Weston (1992, pp. 198-199) as follows:

$$UNSYS_{is}^2 = \sigma_{is}^2 - \beta_{is}^2 \sigma_{Ms}^2 \qquad [5.2]$$

In equation [5.2], σ_{is}^2 is the computed variance of company i's monthly returns in year s (s = 1997-99) (i.e., total risk); β_{is}^2 represents the square of the computed beta for company i in year s (s = 1997-99) (as per equation 5.2); σ_{Ms}^2 is the computed variance of the market indices' monthly returns in year s (s = 1997-99).

(3) Industry Type (*INDU*)

A categorical variable - industry type (i.e., *INDU* - a value of 1, 2, . . ., 5 for services (mainly retail), real estate, utilities, conglomerates and manufacturers, respectively (see Chapter 6, section 6.6)) is used in the sub-group comparison of volume of property insurance purchased. Also, four industry dummies (*INDU1-4*, 1,0) are used in the regression analysis.

(4) Geographical Location (*GEOG*)

Geographical location is measured by a dummy variable that is coded as 1 for the Eastern coastal economic zone and 0 otherwise.

(5) Foreign Ownership (*FOWN*)

Foreign ownership is measured by the fraction of ordinary shares owned by foreign investors.

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years). Thus, the Chinese government guaranteed three-month interest rate for bank savings is used in this study. This rate of interest is also subject to frequent review and modification by the PBOC to reflect changing macroeconomic circumstances.

(6) Taxation (*TAXLOSS* and *TAXRATE*)

In order to capture the effect of the existence of tax-loss carry-forwards on the corporate purchase of insurance, some prior studies have used continuous measures, which are defined as the amount of tax-loss carry-forwards scaled by the book value of total assets (e.g., Nance et al., 1993), or firm value (e.g., Tufano, 1996; Gay and Nam, 1998). However, as noted by Nance et al. (1993), continuous tax measures might be "noisy" surrogates because of the scaling problem (i.e., these measures could also reflect the effects of company size). As a result, this problem could make the empirical results difficult to interpret and hence render the corresponding tests less powerful. In order to overcome the above scaling problem, others researchers have used a discrete measure (dummy variable) to capture the existence of tax-loss carry-forwards (e.g., Berkman and Bradbury, 1996; Mian, 1996; Colquitt and Hoyt, 1997). In the same spirit, a tax dummy (*TAXLOSS)*, with 1 indicating presence of tax-loss carry-forwards and 0 otherwise, is used in this study to capture the effect of the tax convexity introduced by the existence of tax-loss carry-forwards.

As China has a nominally uniform rate of corporation tax, the existence of tax concessions in some companies could result in lower effective tax rate *vis-à-vis* the higher (nominal) tax rates in other companies without tax concessions. To capture the effect of any "tax shield" arising from fiscal concessions, another variable (*TAXRATE*) – the effective tax rate – is used. *TAXRATE* is defined as the ratio of the actual corporate income tax to the taxable income in the current year. A negative relation between *TAXRATE* and the likelihood of insuring and the amount of property insurance purchased is predicted. This is because companies with various tax preferential items (and hence a lower effective tax rate) could be motivated to hedge (via insurance) to exploit fully such tax advantages.

(7) Hedging Substitutes (*SUBSIDY* and *LIQUID*)

Two measures of hedging substitutes are used in this study. Government subsidies (*SUBSIDY*) are measured by the total subsidies received from local/national government in the current accounting year scaled by the annual operating profit. As in Nance et al. (1993), liquidity (*LIQUID*) is measured by the ratio of liquid assets-to-

current liabilities. Where liquid assets are defined as the sum of cash and cash equivalents that can be easily transferred into cash (e.g., short-term bank savings and investments in publicly tradable shares).

The variables used in this study and their proxies are further summarized in Table 5.2.

5.5 STATISTICAL PROCEDURES

This study employs three main statistical procedures to analyze the data collected and test the direction and significance of causality predicted by the five hypotheses proposed in Chapter 4. These statistical procedures include univariate and bivariate analyses and multivariate regressions. The approach followed in each case is discussed in sections below.

5.5.1 Rank Transformations

The data are highly skewed; however, the existence of many zeros/negative values in the data set precludes me from taking log or square root transformations to mitigate the problem of skewness (see Chapter 6, Table 6.1). Therefore, as in Kane and Meade (1998) and Ireland and Lennox (2002), I take rank transformations of the metric variables (i.e., variables other than $INDU_{1-4}$, *GEOG*, *TAXLOSS* and $YEAR_{97-98}$) and replace them with their rank equivalents in the analysis[63].

[63] For the vector $[X_{t,1}, X_{t,2}, \ldots, X_{t,n}]$ of variable X for year t, I replace each value of X_t with its corresponding rank (ranging from 1 to n in ascending sequence) divided by n+1. Observations are then aggregated and result in pooled data that are uniformly distributed between zero and one. Kane and Meade (1998) demonstrate that rank transformations have advantages of preserving comparative information, avoiding arbitrary sample trimming and improving fit. As a result, rank transformations generally perform better than log or square root transformations in resolving the problem of skewed data.

Table 5.2

Summary of Variables and Proxies

This table describes the names, the definitions and the predicted signs of the variables used in this study.

	Variables	Proxies	Label	Sign (+/-)
Dependent variables				
1	Participation	*INSCHO*	Insurance participation decision dummy with one for purchasing insurance and zero otherwise	
2	Volume	*INS*	Corporate annual spending on property insurance scaled by total book value of insurable physical assets	
Independent variables				
1	Managerial ownership	*MAN*	The fraction of the year-end value of total shares owned by company managers relative to the total value of shares in issue	+
2	State ownership	*STATE*	The year-end proportion of the value of State shareholdings to the total value of shares in issue	-
3	Leverage	*LEV*	The ratio of year-end book value of debt to book value of equity	+
4	Investment opportunity set	*GROW*	Approximate Tobin's Q, which is equal to the sum of market value of equity, book value of debt and preference equity divided by book value of total assets (year-end)	+
5	Firm size	*SIZE*	Natural log of year-end book value of total assets	-
Control variables				
1	Interactions	*LEVMAN*	Multiplicative interaction term *MAN*LEV*	+
2	Interactions	*SIZEMAN*	Multiplicative interaction term *MAN* LnSIZE*	-
3	Interactions	*LEVGROW*	Multiplicative interaction term *LEV*GROW*	+/-
4	Systematic risk	*SYS*	Company betas	+
5	Unsystematic risk	*UNSYS*	The decomposed unsystematic portion in the total risk of a firm's share movements	+
6	Industry sector 1	$INDU_1$	One for service (retailing) firm and zero for otherwise	+
7	Industry sector 2	$INDU_2$	One for real estate firm and zero for otherwise	-
8	Industry sector 3	$INDU_3$	One for regulated (utilities) firm and zero for otherwise	+/-
9	Industry sector 4	$INDU_4$	One for conglomerate firm and zero for otherwise	-
10	Industry sector 5	$INDU_5$	One for manufacturing firm and zero for otherwise	+
11	Geographical location	*GEOG*	Dummy variable with one for coastal regions and zero for otherwise	+
12	Foreign ownership	*FOWN*	The fraction of shareholdings owned by foreign investors	+
13	Tax 1	*TAXLOSS*	Dummy variable with one for the existence of tax-loss carry-forwards at the beginning of each accounting year and zero for otherwise	+
14	Tax 2	*TAXRATE*	Effective tax rate, defined as the ratio of actual corporate income tax to the taxable income	-
15	Hedging substitutes	*SUBSIDY*	Total subsidies received from local government scaled by the annual operating profits	-
16	Hedging substitutes	*LIQUID*	The ratio of liquid assets to current liabilities	-

Source: Research Literature Review

5.5.2 Univariate Analysis

The cross-sectional and time-series data are first pooled and described using descriptive statistics including mean, median, standard deviation, skewness, kurtosis, minimum and maximum. This practice helps to summarize the overall characteristics of the dataset and ascertain the patterns (e.g., the distribution) for each variable. For example, a highly skewed variable could suggest that a natural logarithm transformation needs to be taken in order to reduce the variability and the influence of extreme values. Second, the means of firm-specific characteristics for insurance users and non-users are computed and the Student's t-tests for the significance of the differences between the means of these characteristics for users and non-users are conducted (see Chapter 6, section 6.2).

Finally, in order to determine whether statistical differences exist between the means/medians of the level of property insurance usage across sub-groups of time-invariant control variables (i.e., *GEOG* and *INDU*) that cannot be included in the volume decision model (see section 5.5.4), both parametric (i.e., Student's t-test) and non-parametric statistical tests (e.g., Mann-Whitney U-test) are performed. The rationale for using non-parametric tests as a supplement to their parametric equivalents is that such tests are less sensitive to the distributional differences (e.g., variance) between two or more sample groups and hence more likely to produce robust results (Bryman and Cramer, 1997). The results of these tests are reported in Chapter 6, section 6.6 (Table 6.7).

5.5.3 Bivariate Analysis

The bivariate analysis conducted in this study involves testing for associations between the dependent and independent variables. To achieve this aim, pair-wise correlation analyses are performed, where the correlation coefficients between metric variables are calculated using Pearson product-moment correlation coefficients, while those involved non-metric variables are computed using the non-parametric Spearman rank test. Indeed, Bryman and Cramer (1997) argue that the investigation of associations among variables through correlation analysis is an initial but important

step in explaining the underlying phenomena in which researchers are primarily interested. Chow (1982) further notes that from econometric point of view, correlation analysis should be performed prior to carrying out multivariate tests. He reasons that such an approach helps to minimize the risk that variable measurement errors and/or inter-correlated variables may remain undetected, and so distort the statistical significance of multivariate results. In addition, correlation analysis could reveal high and statistically significant collinarity between independent variables. Thus, additional diagnostic tests (e.g., variance inflation factors, VIFs) may have to be carried out in order to ascertain whether coefficient estimates derived in multivariate tests are rendered inefficient by multicollinearity (Belsley, Kuh and Welsch, 1980).

5.5.4 Multivariate Regressions

The relation between the dependent variables and independent variables detected from the bivariate correlation analysis can be spurious if they both interact with other variable(s). Therefore, in order to determine the "real" underlying relation between the corporate purchase of property insurance and firm-specific characteristics, multivariate analysis is carried out in addition to univariate /bivariate tests (Bryman and Cramer, 1997).

5.5.4.1 Insurance Participation Decision Model

As Chapter 1 (section 1.2) makes clear, the aims of this study are twofold, namely, to examine empirically the determinants of both the managerial propensity to purchase property insurance and the financial extent of property insurance use by publicly listed companies in the PRC. To achieve these aims, a Heckman's two-step sample selection procedure is employed to determine the linkage between the corporate purchase of property insurance and firm-specific characteristics. This approach is consistent with that taken in prior research into the derivatives hedging activities of companies (e.g., Colquitt and Hoyt, 1997; Hardwick and Adams, 1999). In the first stage of the analysis, a probit model with a binary dependent variable (*INSCHO*) is utilized to examine the effect of firm-specific characteristics on the probability of purchasing property insurance (i.e., the participation decision model).

The second stage of the multivariate analysis involves a panel model incorporating the sample selection correction (i.e., the inverse Mill's ratio) derived from the first-stage probit model. This procedure enables one to analyze the linkage between firm-specific characteristics and the financial extent of the use of property insurance (*INS*) (i.e., the volume decision model). The rationale for this approach is twofold. First, a conventional (ordinary least square (OLS)) linear regression model does not accommodate the binary nature of the decision-choice dependent variable (e.g., see Greene, 1999). Second, a single Tobit model is considered to be inappropriate, as it cannot achieve the stated aim of investigating both the determinants of the insurance participation and volume decisions. Indeed, both Colquitt and Hoyt (1997) and Haushalter (2000) acknowledge the importance of investigating the nature of these two types of managerial decision.

The probit insurance participation decision model used in this study is thus:

$$Y_{it}^{*} = \beta_0+\beta_1 MAN_{it}+\beta_2 STATE_{it}+\beta_3 LEV_{it}+\beta_4 GROW_{it}+\beta_5 SIZE_{it}+\beta_6 LEVMAN_{it} + \beta_7 SIZEMAN_{it}+ \beta_8 LEVGROW_{it} + \beta_9 SYS_{it} +\beta_{10} UNSYS_{it} + \beta_{11} INDU_{1,it}+ \ldots +\beta_{14} INDU_{4,it}+\beta_{15} GEOG_{it}+\beta_{16} FOWN_{it}+\beta_{17} TAXLOSS_{it}+\beta_{18} TAXRATE_{it}+ \beta_{19} SUBSIDY_{it}+ \beta_{20} LIQUID_{it} + \beta_{21} YEAR_{97} + \beta_{22} YEAR_{98} + \varepsilon_{it} \quad [5.3]$$

In equation [5.3], the latent variable, Y_{it}^{*}, is not observable; its observable counterpart is Y_{it} (*INSCHO*), which is equal to 1 if $Y_{it}^{*}>0$, denoting a company with insurance purchase; and 0 if $Y_{it}^{*} <= 0$, denoting a company without insurance purchase. The other variables are the same as what are defined previously in section 5.4.2-5.4.3 and Table 5.2. However, $YEAR_{97}$ and $YEAR_{98}$ are year dummy variables included in the regression to control for the possible time-related effects; $\varepsilon_{it} \sim N(0,1)$ is a disturbance term.

5.5.4.2 Insurance Volume Decision Model

The panel data design also controls for omitted/unobservable firm-specific effects (e.g., differences in inter-company risk management expertise) and/or period-specific effects (e.g., insurance underwriting cycles), thereby producing more informative and reliable parameter estimations than separate single period and/or simple pooled OLS analysis (Baltagi, 1995; Greene, 1999) (also see footnote 6).

Subject to the different assumptions made about the distribution of these effects, the main estimation techniques are usually the fixed-effects and random-effects (error components) models. The former model treats omitted firm-specific variables as constant over time and/or period-specific variables as invariant across companies. In contrast, the random-effects model treats firm and period-specific factors as random.

To determine the appropriate regression model for the volume decision model, a two-stage diagnostic procedure is followed (see Table 6.6). First, Wald and Breusch and Pagan Lagrange Multiplier (LM) tests are conducted to examine the relative efficiency of the heterogeneous fixed/random-effects estimation against the homogeneous pooled OLS model (e.g., Das and Srinivasan, 1999; Ragan, Warren and Bratsberg, 1999). The Wald F-statistic and the LM Chi-square value are both statistically significant at the level 0.01 (one-tailed). These results thus suggest that fixed/random-effects models are more efficient than the pooled cross-sectional OLS model. Second, the Hausman (1978) specification test, which is based on the differences between the coefficients estimated from fixed or random-effects models, is performed to determine which kind of panel model – fixed or random-effects – should be used in this study (Greene, 1999). The computed Chi-square statistic is also found to be statistically significant at the level 0.01 (one-tailed), indicating that the null hypothesis of zero correlation between the unobservable firm-specific effects and the explanatory variables in the model can be rejected. In this case, the fixed-effects model can still derive consistent estimates but the random-effects model cannot and so the former is used in this study. Additionally, because the data are not a random sample drawn from a large population, random-effects model is considered not to be appropriate and hence, a fixed-effects model is employed (Baltagi, 1995). However, the fixed-effects model could not produce parameter estimates for two time-invariant control variables (i.e., *GEOG* and *INDU*) because of the multicollinearity between them and the fixed-effects[64]. Instead, these time-invariant variables are analyzed separately using parametric and non-parametric statistics (see Chapter 6, section 6.6). The fixed-effects insurance volume decision model with Heckman's sample selection correction that is employed in this study can thus be expressed as:

[64] Though *GEOG* and $INDU_{1-4}$ are not included explicitly in the volume decision model, it is important to note that the use of firm-specific and time-invariant fixed-effects is able to control for the influence of *GEOG* and $INDU_{1-4}$ (e.g., see Sun et al., 2002).

$$INS_{it} = \alpha_0 + \alpha_i + \gamma_t + \beta_1 MAN_{it} + \beta_2 STATE_{it} + \beta_3 LEV_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 LEVMAN_{it} + \beta_7 SIZEMAN_{it} + \beta_8 LEVGROW_{it} + \beta_9 SYS_{it} + \beta_{10} UNSYS_{it} + \beta_{11} FOWN_{it} + \beta_{12} TAXLOSS_{it} + \beta_{13} TAXRATE_{it} + \beta_{14} SUBSIDY_{it} + \beta_{15} LIQUID_{it} + \beta_{16} \lambda_{it} + \delta_{it} \quad [5.4]$$

In equation [5.4], INS_{it}, the financial extent of property insurance use by Chinese listed companies, is defined as the annual corporate spending on property insurance scaled by the total book value of insurable physical assets. α_i represents the time-invariant firm-specific effect dummies that capture the unobservable differences among companies; γ_t is the firm-invariant period-specific effect dummies that capture the possible time-related changes; λ_{it} is the inverse Mill's ratio generated by the first-step probit decision model that controls for the possible sample selection bias in the volume model where only companies purchasing property insurance are selected; α_0 is the intercept; δ_{it} is an error term that is assumed to have a zero mean and constant variance; $_{it}$ are the company/year observations over the period 1997-99.

5.6 CONCLUSION AND SUMMARY

This chapter examines the rationale for using statistical analysis techniques in this study. The chapter also describes the research design, including the sources of data, definition and measurement of the variables used. The chapter suggests that due to the existence of regulatory and other institutional constraints, statistical analysis is the most appropriate and viable research method that can be employed in this study. The statistical procedures employed include univariate/bivariate techniques and multivariate tests. Parametric and non-parametric statistics are both deemed to be appropriate given the use of metric and non-metric variables in this study. A Heckman's two-step sample selection approach that consists of a probit participation decision model and a volume decision model with sample selection correction is adopted for the multivariate tests. The rationale for selecting these regression procedures is also outlined in this chapter. The empirical results obtained from these statistical analyses are analyzed and discussed in the next chapter of this thesis.

CHAPTER 6: EMPIRICAL RESULTS AND EVALUATION

6.1 INTROUDUCTION

The implications of agency theory for explaining the discretionary purchase of property insurance by publicly listed Chinese companies have been examined in Chapter 4 of this thesis. From this analysis, the five hypotheses, three interaction terms and seven control variables that are put forward in Chapter 4 (sections 4.2-4.4) are now tested using the statistical procedures described in Chapter 5.

6.2 UNIVARIATE RESULTS

Panel A of Table 6.1 gives the descriptive statistics for the dependent and explanatory variables for the pooled company/year sample of PRC-based publicly listed companies for the period 1997-99. Clearly, Panel A shows that many variables are highly skewed and have zero/negative values. As such, the use of rank transformations (section 5.5.1) appears to be justified. Additionally, *TAXRATE*, *TAXLOSS*, *FOWN*, *MAN* and *SIZE* vary more substantially than the other variables in the sample. This suggests that the sample of PRC-based publicly listed companies exhibits diverse firm-specific characteristics, thus implying possible differences in the use of property insurance. Panel C of Table 6.1 reveals that roughly 85 percent of the sampled companies purchased some amount of property insurance over the research period. However, amongst those insuring companies, about 95 percent spent less than one percent of the book value of insurable physical assets on property insurance. This level of property insurance expenditure is much lower compared with the figures reported in some more developed economies. For example, Hoyt and Khang (2000) report that in the US, the average annual value of property insurance premiums spent by publicly listed US corporations is roughly 5 percent of the book value of insurable assets. In China, the relatively low levels of property insurance purchased by publicly listed companies could reflect the substitutive

Table 6.1

235 Chinese Publicly Listed Companies – Descriptive Statistics

This table gives the descriptive statistics for the dependent and independent variables for the pooled firm/year observations for 235 Chinese publicly listed companies for 1997-99 (n=668). Supplementary information covering comparison with non-included firms and insurance spending groupings are also given in Panels B and C, respectively.

Panel A: Descriptive Statistics (*SIZE* is measured in RMB millions)

	Mean	Median	Std.Dev.	Skewness	Kurtosis	Minimum	Maximum
INSCHO	0.887	1.000	0.316	-2.454	7.023	0.000	1.000
INS	0.0026	0.0012	0.0044	3.7890	19.9404	0.0000	0.0330
MAN	0.0006	0.0003	0.0009	3.4010	18.0940	0.0000	0.0071
STATE	0.297	0.299	0.257	0.189	1.677	0.000	0.886
LEV	1.027	0.851	0.719	1.311	5.153	0.019	4.337
GROW	2.001	1.720	0.957	2.172	9.364	0.858	8.518
SIZE	127.867	80.223	134.689	2.676	12.106	11.928	1,034.040
LEVMAN	0.000	0.000	0.0005	0.052	18.539	-0.0038	0.0028
SIZEMAN	0.000	0.000	0.0007	-1.096	36.503	-0.0076	0.0051
LEVGROW	-0.227	-0.040	0.632	-1.852	10.938	-4.437	2.499
SYS	1.056	0.980	0.537	0.788	4.661	-0.930	3.740
UNSYS	9.875	9.362	3.924	1.484	7.574	0.228	36.071
$INDU_1$	0.617	1.000	0.487	-0.479	1.228	0.000	1.000
$INDU_2$	0.159	0.000	0.366	1.864	4.472	0.000	1.000
$INDU_3$	0.048	0.000	0.213	4.249	19.053	0.000	1.000
$INDU_4$	0.055	0.000	0.228	3.902	16.223	0.000	1.000
$INDU_5$	0.121	0.000	0.327	2.319	6.375	0.000	1.000
GEOG	0.634	0.000	0.482	-0.551	1.303	0.000	1.000
FOWN	0.076	0.000	0.147	1.686	4.537	0.000	0.664
TAXLOSS	0.106	0.000	0.308	2.553	7.516	0.000	1.000
TAXRATE	0.322	0.146	4.652	25.836	668.999	-0.797	120.812
SUBSIDY	0.098	0.000	0.445	9.825	116.049	-0.088	6.323
LIQUID	0.955	0.683	0.950	3.233	17.682	-0.051	8.681

Panel B: Comparison of Sample Firms with Non-included Firms (Mann-Whitney U test)

	Year	Sample		Non-included Firms		z-statistic
		No. of Firms	Median	No. of Firms	Median	(two-tailed)
lnSIZE	1997	203	11.180	542	11.080	1.304
	1998	234	11.310	651	11.280	0.471
	1999	231	11.400	745	11.380	0.308
LEV	1997	203	0.847	542	0.867	-0.291
	1998	234	0.836	651	0.825	0.144
	1999	231	0.859	745	0.844	0.156

Panel C: Insurance Spending (*INS*) Groupings

	***INS* Groups**							
	0	0.000-0.005	0.005-0.010	0.010-0.015	0.015-0.020	0.020-0.025	0.025-0.030	0.030-0.035
Frequency	75	512	48	12	9	5	4	3
Percent%	11.23	76.64	7.19	1.80	1.35	0.75	0.60	0.44

Source: Research Data

Notes:

INSCHO = insurance participation variable, 1 = insure and 0 = uninsure; ***INS*** = extent of property insurance use, defined as annual corporate property insurance spending scaled by total insurable physical assets; ***MAN*** = managerial ownership – measured by the proportion of the number of common shares held by company managers; ***STATE*** = State shareholdings, defined as the fraction of the number of State-held shares over the total shares in issue; ***LEV*** = financial leverage – represented by the ratio of debt (long-term plus short-term)-to-equity; ***GROW*** = Tobin's Q, defined as the ratio of the sum of the book value of debt and market value of equity to the replacement cost of the firm's assets; ***SIZE*** = company size – the book value of total assets; ***LEVMAN*** = multiplicative interaction term between ***LEV*** and ***MAN***; ***SIZEMAN*** = multiplicative interaction term between ***SIZE*** and ***MAN***; ***LEVGROW*** = multiplicative interaction term between ***LEV*** and ***GROW***; ***SYS*** = systematic risks, measured by company beta which is derived by regressing the monthly risk return of company shares on the market risk return; ***UNSYS*** = unsystematic risks, measured by the difference between the total risks (i.e., the standard deviation of share return) and systematic risks; $INDU_{1-5}$ = industry dummies with 1 for service, real estate, utilities, conglomerate and manufacturing firms, respectively, and 0 otherwise; ***GEOG*** = geographical location – dummy variable, coastal economic zones = 1, inland economic zones = 0; ***FOWN*** = foreign ownership – measured by the proportion of shareholdings held by foreign investors; ***TAXLOSS*** = tax-loss carry-forwards dummy, 1 = the existence of tax-loss carry-forwards in the beginning of an accounting year and 0 = otherwise; ***TAXRATE*** = effective tax rate, measured by corporate income tax scaled by taxable income in the current year; ***SUBSIDY*** = government subsidies, measured by the total subsidies received from the local government scaled by the annual operating profit in the current accounting year; ***LIQUID*** = liquidity, measured by the ratio of liquid assets-to-current liabilities, where liquid assets are defined as the sum of cash and cash equivalents that can be easily transferred into cash (e.g., short-term bank savings and investments in publicly tradable shares).

protectionist role still played by the State in the national economy (producing the so-called State "charity hazard" effects – e.g., see Browne and Hoyt, 2000).

Panel A of Table 6.2 reports the means of explanatory variables for insurance users/non-users as well as Student's t-tests of differences in the means of continuous variables between the insurance users/non-users. These parametric tests suggest that consistent with what was hypothesized, property insurance users tend to have higher leverage and generally lower liquidity than non-users. However, property insurance users are unexpectedly large companies with low Tobin's Q values (*GROW*). Additionally, statistically significant differences in *LEVMAN* and *LEVGROW* are found between

Table 6.2

Comparison of Firm Characteristics Between Insurance Users and Nonusers

This table presents the results of Student's t and χ^2 tests of differences in the firm-specific characteristics between insurance users and nonusers from the pooled and rank transformed data (n=668).

Panel A: Student's t-tests Using Metric Variables

Variables	Predicted Sign	Users (n1=593)		Non-users (n2=75)		t-stat
		Mean	Std. Dev.	Mean	Std. Dev.	
MAN	Users>Non-users	0.497	0.283	0.523	0.319	-0.674
STATE	Users<Non-users	0.504	0.284	0.471	0.275	0.982
LEV	Users>Non-users	0.515	0.280	0.379	0.318	3.519***
GROW	Users>Non-users	0.490	0.288	0.580	0.277	-2.590***
SIZE	Users<Non-users	0.510	0.287	0.414	0.279	2.756***
LEVMAN	Users>Non-users	0.519	0.282	0.346	0.286	4.987***
SIZEMAN	Users<Non-users	0.505	0.283	0.457	0.318	1.239
LEVGROW	Indeterminate	0.507	0.285	0.442	0.300	1.834**
SYS	Users>Non-users	0.501	0.286	0.494	0.302	0.173
UNSYS	Users>Non-users	0.500	0.286	0.501	0.299	-0.006
FOWN	Users>Non-users	0.502	0.217	0.482	0.199	0.817
TAXRATE	Users<Non-users	0.497	0.287	0.523	0.292	-0.751
SUBSIDY	Users<Non-users	0.507	0.257	0.541	0.246	-1.120
LIQUID	Users<Non-users	0.487	0.284	0.602	0.297	-3.280***

Panel B: χ^2 Tests of Independence Between Non-Metric Variables and Insurance Participation

Variables	χ^2 Stat	d.f.	p-value (one-tailed)
GEOG	3.853	1	0.050**
$INDU_1$	0.453	1	0.501
$INDU_2$	1.908	1	0.167
$INDU_3$	0.320	1	0.572
$INDU_4$	19.980	1	0.000***
$INDU_5$	8.053	1	0.005***
TAXLOSS	5.746	1	0.017**

Source: Research Data

Note:

1. ***INSCHO*** = insurance participation variable, 1 = insure and 0 = uninsure; ***INS*** = extent of property insurance use, defined as annual corporate property insurance spending scaled by total insurable physical assets; ***MAN*** = managerial ownership – measured by the proportion of the number of common shares held by company managers; ***STATE*** = State shareholdings, defined as the fraction of the number of State-held shares over the total shares in issue; ***LEV*** = financial leverage – represented by the ratio of debt (long-term plus short-term)-to-equity; ***GROW*** = Tobin's Q, defined as the ratio of the sum of the book value of debt and market value of equity to the replacement cost of the firm's assets; ***SIZE*** = company size – the book value of total assets; ***LEVMAN*** = multiplicative interaction term between ***LEV*** and ***MAN***; ***SIZEMAN*** = multiplicative interaction term between ***SIZE*** and ***MAN***; ***LEVGROW*** = multiplicative interaction term

between ***LEV*** and ***GROW***; ***SYS*** = systematic risks, measured by company beta which is derived by regressing the monthly risk return of company shares on the market risk return; ***UNSYS*** = unsystematic risks, measured by the difference between the total risks (i.e., the standard deviation of share return) and systematic risks; $INDU_{1\text{-}5}$ = industry dummies with 1 for service, real estate, utilities, conglomerate and manufacturing firms, respectively, and 0 otherwise; ***GEOG*** = geographical location – dummy variable, coastal economic zones = 1, inland economic zones = 0; ***FOWN*** = foreign ownership – measured by the proportion of shareholdings held by foreign investors; ***TAXLOSS*** = tax-loss carry-forwards dummy, 1 = the existence of tax-loss carry-forwards in the beginning of an accounting year and 0 = otherwise; ***TAXRATE*** = effective tax rate, measured by corporate income tax scaled by taxable income in the current year; ***SUBSIDY*** = government subsidies, measured by the total subsidies received from the local government scaled by the annual operating profit in the current accounting year; ***LIQUID*** = liquidity, measured by the ratio of liquid assets-to-current liabilities, where liquid assets are defined as the sum of cash and cash equivalents that can be easily transferred into cash (e.g., short-term bank savings and investments in publicly tradable shares). The rank-transformed equivalents of these variables are used.

2. *** Statistically significant at the 0.01 level ** Statistically significant at the 0.05 level * Statistically significant at the 0.10 level. Reported p-values are one-tailed unless a variable is not uni-directionally predicted.

property insurance users and non-users. This finding suggests that leverage and managerial ownership, leverage and growth options could interact to influence the corporate property insurance decision. Otherwise, no statistically significant differences in *MAN*, *STATE*, *SYS*, *UNSYS*, *FOWN*, *SUBSIDY* and *TAXRATE* are found between property insurance users and non-users. Panel B of Table 6.2 reports the results of non-parametric χ^2 test of independence between the insuring decision and the non-metric variables. The results reveal that there are geographical (*GEOG*) and industrial ($INDU_4$ and $INDU_5$) differences in the insuring behavior of sample companies. The existence of tax-loss carry-forwards (*TAXLOSS*) also appears to influence the corporate insuring decision. While these χ^2 tests are indicative of a possible linkage between the insuring decision and corresponding independent variables, they do not indicate the direction of such relations.

Table 6.3
Correlation Coefficients Matrix

This table presents the correlation coefficients between variables.

	INSCHO	INS	MAN	STATE	LEV	GROW	SIZE	LEVMAN	SIZEMAN	LEVGROW	SYS	UNSYS
INSCHO	-											
INS	-	-										
MAN	-0.029	0.021	-									
STATE	0.035	0.004	-0.167***	-								
LEV	0.149***	-0.076*	-0.089**	0.012	-							
GROW	-0.100***	0.105***	0.298***	-0.168***	-0.406***	-						
SIZE	0.106***	-0.089**	-0.059	0.073*	0.301***	-0.455***	-					
LEVMAN	0.190***	0.007	-0.011	0.138***	0.086**	-0.087**	0.054	-				
SIZEMAN	0.053	-0.030	0.023	-0.073*	0.051	0.089**	0.002	0.215***	-			
LEVGROW	0.071*	0.046	-0.060	0.041	0.017	-0.087**	0.008	0.247***	0.048	-		
SYS	0.007	-0.073*	0.070*	-0.019	-0.026	0.046	0.024	-0.017	0.015	-0.061	-	
UNSYS	0.005	0.038	-0.047	-0.025	0.076*	0.063	-0.104***	0.053	-0.039	0.048	0.051	-
$INDU_1$	0.025	-0.051	0.096**	0.027	0.012	-0.040	-0.084**	0.021	-0.081**	0.042	0.089**	-0.100**
$INDU_2$	-0.054	-0.204***	0.071*	0.105***	0.168***	-0.062	0.178***	0.110***	-0.002	0.027	-0.006	-0.009
$INDU_3$	0.023	0.060	0.002	0.007	-0.072*	0.013	0.013	0.026	-0.034	0.057	-0.037	-0.092**
$INDU_4$	-0.171***	-0.126***	0.013	-0.158***	-0.034	0.093**	-0.093**	-0.129***	-0.020	-0.113***	-0.011	0.040
$INDU_5$	0.109***	0.176***	-0.114***	0.036	-0.026	-0.011	0.041	0.011	0.059	0.006	-0.040	0.095**
GEOG	-0.080**	-0.212***	-0.019	-0.197***	0.131***	-0.173***	0.273***	-0.039	-0.093**	-0.059	0.008	-0.047
FOWN	0.060	-0.006	-0.111***	-0.118***	0.066*	-0.304***	0.305***	-0.033	0.014	-0.004	-0.088**	0.096**
SUBSIDY	0.080**	0.013	-0.003	0.036	0.101***	-0.043	0.115***	-0.002	-0.058	-0.011	-0.008	-0.029
TAXLOSS	-0.093**	-0.130***	-0.129***	0.007	0.148***	-0.104***	-0.029	-0.076*	0.031	-0.041	-0.032	0.131***
TAXRATE	-0.029	0.030	-0.044	0.134***	-0.080**	-0.029	0.113***	0.032	-0.037	-0.030	0.057	-0.128***
LIQUID	-0.126***	0.060	0.036	0.001	-0.474***	0.314***	-0.123***	-0.075	0.004	-0.136***	-0.004	-0.041

(Cont.)

Table 6.3 (Cont.)
Correlation Coefficients Matrix

	$INDU_1$	$INDU_2$	$INDU_3$	$INDU_4$	$INDU_5$	GEOG	FOWN	SUBSIDY	TAXLOSS	TAXRATE	LIQUID
$INDU_1$	-										
$INDU_2$	-0.098**	-									
$INDU_3$	-0.104***	-0.054	-								
$INDU_4$	-0.162***	-0.083**	-0.089**	-							
$INDU_5$	-0.554***	-0.285***	-0.303***	-0.113***	-						
GEOG	-0.082**	0.128***	0.144***	0.069*	-0.108***	-					
FOWN	-0.121***	0.030	-0.065*	-0.051	0.143***	0.236***	-				
SUBSIDY	-0.105***	0.002	-0.025	-0.057	0.128***	0.060	-0.091**	-			
TAXLOSS	-0.033	0.123***	-0.061	0.043	-0.029	0.203***	0.108***	-0.041	-		
TAXRATE	0.112***	-0.001	-0.037	-0.100***	0.001	-0.103***	-0.109***	0.202***	0.114***	-	
LIQUID	-0.305***	-0.178***	0.024	-0.073*	0.346***	-0.078**	0.005	0.018	-0.185***	-0.217***	-

Source: Research Data

Note:

1. ***INSCHO*** = insurance participation variable, 1 = insure and 0 = uninsure; ***INS*** = extent of property insurance use, defined as annual corporate property insurance spending scaled by total insurable physical assets; ***MAN*** = managerial ownership – measured by the proportion of the number of common shares held by company managers; ***STATE*** = State shareholdings, defined as the fraction of the number of State-held shares over the total shares in issue; ***LEV*** = financial leverage – represented by the ratio of debt (long-term plus short-term)-to-equity; ***GROW*** = Tobin's Q, defined as the ratio of the sum of the book value of debt and market value of equity to the replacement cost of the firm's assets; ***SIZE*** = company size – the book value of total assets; ***LEVMAN*** = multiplicative interaction term between ***LEV*** and ***MAN***; ***SIZEMAN*** = multiplicative interaction term between ***SIZE*** and ***MAN***; ***LEVGROW***= multiplicative interaction term between ***LEV*** and ***GROW***; ***SYS*** = systematic risks, measured by company beta which is derived by regressing the monthly risk return of company shares on the market risk return; ***UNSYS*** = unsystematic risks, measured by the difference between the total risks (i.e., the standard deviation of share return) and systematic risks; $INDU_{1\text{-}5}$ = industry dummies with 1 for service, real estate, utilities, conglomerate and manufacturing firms, respectively, and 0 otherwise; ***GEOG*** = geographical location – dummy variable, coastal economic zones = 1, inland economic zones = 0; ***FOWN*** = foreign ownership – measured by the proportion of shareholdings held by foreign investors; ***TAXLOSS*** = tax-loss carry-forwards dummy, 1 = the existence of tax-loss carry-forwards in the beginning of an accounting year and 0 = otherwise; ***TAXRATE*** = effective tax rate, measured by corporate income tax scaled by taxable income in the current year; ***SUBSIDY*** = government subsidies, measured by the total subsidies received from the local government scaled by the annual operating profit in the current accounting year; ***LIQUID*** = liquidity, measured by the ratio of liquid assets-to-current liabilities, where liquid assets are defined as the sum of cash and cash equivalents that can be easily transferred into cash (e.g., short-term bank savings and investments in publicly tradable shares).

2. Reported correlations were computed using the Spearman rank test among the rank-transformed equivalents of corresponding variables (except for the non-metric variables). The number of cases involved in the calculation of correlation with *INS* is 593 observations; otherwise it is 668 observations.

3. *** Statistically significant at the 0.01 (two-tailed) ** Statistically significant at the 0.05 (two-tailed) * Statistically significant at the 0.10 (two-tailed).

6.3 BIVARIATE RESULTS

Table 6.3 presents the correlation coefficients between the dependent and explanatory variables for the pooled firm/year observations for 1997-99. The pair-wise correlation coefficients (Spearman rank) reveal statistically significant positive associations between the insurance participation decision variable (*INSCHO*) and *LEV* and *SIZE* (though the latter is inconsistent with expectations) ($p \leq 0.01$, two-tailed). These results suggest that large and highly levered Chinese companies are more likely to insure than small and lowly levered companies. As expected, the insuring propensity of managers appears to vary from industry to industry – for example, manufacturing firms are more likely to insure than other types of firms; whereas conglomerate firms appear to be less likely to insure than firms in other industries. Among the hedging substitutes, only *LIQUID* seems to have an expected (and statistically significant) correlation with the corporate insurance decision ($p \leq 0.01$, two-tailed). That is, the higher a company's liquidity, the less likely managers are to purchase property insurance. Contrary to hypothesis (H4a), *GROW* is found to be inversely related to *INSCHO*. Also different what was expected, *GEOG* is found to be negatively associated with *INSCHO*, implying that companies incorporated in economically more developed Eastern coastal regions are less likely to purchase property insurance than inland-based companies. The correlation analysis results provide little support for taxation-induced explanation for the corporate purchase of insurance. Again, the significant correlation between some of interactions terms (e.g., *LEVMAN*) and *INSCHO* suggests that some key variables could have joint influence on the corporate decision to participate into property insurance use.

Turning to the extent to which property insurance is used, it is interesting to note that consistent with what was expected, large companies appear to insure to a relatively lesser extent than small companies - though the former seems more likely to take out property insurance in the first place. Additionally, as predicted, *GROW* is found to be positively and significantly related to *INS* ($p \leq 0.01$, two-tailed). However, inconsistent with what was hypothesized, highly levered companies tend to buy less property insurance than their lowly levered counterparts despite the formers' greater likelihood to insure. The correlation results regarding the impact of industry and geographical factors on the volume of insurance purchased are generally consistent

with those of insurance participation. *TAXLOSS* is found to be unexpectedly and negatively related to both the likelihood and extent of property insurance usage. No other explanatory variables are found to exhibit predicted and statistically significant correlations with *INS*. It is worth noting, however, that some independent variables (e.g., *LEV* and *SIZE*) appear to have different directional of influences on the insurance participation and volume decisions, respectively. Thus, the determinants of these two decisions could be different, thereby justifying the need for a two-stage multivariate analysis in this study (Haushalter, 2000).

The statistically significant correlation between some of the explanatory variables also raises the possibility of multicollinearity. However, the correlation coefficients between pairs of independent variables are generally low (all less than 0.6), suggesting that a serious collinearity problem is unlikely (e.g., see Judge, Hill, Griffiths, Lutkepohl and Lee, 1982, p.620). On the other hand, collinearity can be present between more than two independent variables. To test for this, variance inflation factors (VIFs) for each independent variable and condition indices for each regression model are computed (see Table 6.4)[65]. The calculated VIFs of independent variables in both participation and volume models were all less than 2.5 and the (largest) condition index in each model was about 11. Therefore, it is felt that multicollinearity is unlikely to be a severe problem in this study (e.g., see Kennedy, 1998, p.190).

6.4 MULTIVARIATE RESULTS

To allow for potential interactions among the independent variables, two multivariate regression models - the probit participation decision model and the fixed-effects volume decision model - are estimated. The results (including diagnostics) are analyzed in sections 6.4.1 and 6.4.2 below.

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[65] VIF is calculated by regressing each independent variable in turn on all other independent variables and then calculating $1/(1-R^2)$. Condition indices are the square roots of the ratios of the largest eignvalue to each successive eignvalue. According to Kennedy (1998, p. 190), a condition index greater than 15 indicates a possible collinearity problem and an index greater than 30 suggests a potentially serious collinearity problem.

6.4.1 Participation Decision Model Results

Equation [5.3] (see Chapter 5, section 5.5.4) is estimated and several diagnostic statistics are calculated. The parameter estimates and relevant test statistics are shown in Table 6.5. The coefficients for *LEV* are found to be positive and statistically significant ($p \leq 0.05$, one-tailed). This is consistent with the univariate and bivariate results. As mentioned in Chapter 4, section 4.2.3, managers of highly levered companies are motivated to purchase property insurance in order to reduce the costs of financial distress and/or control for agency problems (e.g., the underinvestment problem) associated with the use of debt. Therefore, this finding supports the hypothesis (H3a) that highly levered companies are more likely to use property insurance than companies with less debt in their capital structure in order to mitigate shareholder-debtholder incentive conflicts. Indeed, Ma et al. (1998) report that in China it is becoming increasingly common for major creditors to request collateralized assets-related insurance coverage to give them *ex-ante* protection against *ex-post* losses.

Consistent with what was hypothesized (H1a), *MAN* is found to have positive influence on a company's propensity to purchase property insurance (despite its insignificance). As noted earlier (section 4.3), the linkage between managerial share ownership and the corporate purchase of property insurance in China needs to be considered jointly with two interactive terms – *LEVMAN* and *SIZEMAN*. The former is found to be positive and statistically significant ($p \leq 0.01$, one-tailed), suggesting that for given levels of insider ownership, the managerial propensity to purchase property insurance increases with leverage[66]. This finding is consistent with the *managerial risk-aversion* hypothesis of Smith and Stulz (1985), but runs counter to the *managerial incentive-alignment* hypothesis (e.g., see Downs and Sommer, 1999). This is because when company leverage increases, the risk of financial distress becomes higher thus enhancing the equity price risk of managers' shareholdings and

[66] To see this, the partial derivative of Y^* with respect to *MAN* is calculated to derive the relation between *MAN* and property insurance participation decision. This relation is $0.026+0.151*LEV+0.026*SIZE$. Clearly, the relation between *MAN* and property insurance participation decision is positively moderated by *LEV*.

Table 6.5
Multivariate Results of the Probit Participation Decision Model (pooled data – 668 company/year observations)

This table presents the regression results of the probit participation decision model.

	Predicted Signs (+/-)	Coefficient Estimate	Standard Errors	t-stat	p-value
Intercept	+/-	0.048	0.105	0.455	0.649
MAN	+	0.026	0.039	0.673	0.250
STATE	-	-0.030	0.040	-0.751	0.226
LEV	+	0.118	0.053	2.195	0.014**
GROW	+	0.005	0.048	0.112	0.455
SIZE	-	0.069	0.043	1.589	0.056*
LEVMAN	+	0.151	0.039	3.861	0.000***
SIZEMAN	-	0.026	0.036	0.732	0.232
LEVGROW	+/-	-0.036	0.038	-0.931	0.352
SYS	+	0.005	0.034	0.133	0.447
UNSYS	+	-0.013	0.036	-0.369	0.356
$INDU_1$	+	-0.015	0.036	-0.424	0.335
$INDU_2$	-	-0.178	0.102	-1.736	0.041**
$INDU_3$	+/-	0.019	0.040	0.469	0.638
$INDU_4$	-	-0.115	0.050	-2.301	0.010***
GEOG	+	-0.051	0.023	-2.252	0.012**
FOWN	+	0.021	0.062	0.346	0.364
TAXLOSS	+	-0.078	0.050	-1.563	0.059*
TAXRATE	-	-0.079	0.038	-2.085	0.018**
SUBSIDY	-	-0.091	0.098	-0.925	0.177
LIQUID	-	-0.013	0.059	-0.214	0.415
$YEAR_{97}$	+/-	-0.040	0.028	-1.425	0.154
$YEAR_{98}$	+/-	-0.008	0.025	-0.308	0.758

Diagnostics	
χ^2 test that parameters are jointly zero	$\chi^2_{(22)}$ = 82.52, p-value=0.000***
Pseudo-R^2	0.466
LM test for hetroscedasticity	$\chi^2_{(1)}$ = 0.144, p-value=0.704

Source: Research Data

Note:

1. The univariate probit participation decision model estimated is:

$Y_{it}^* = \beta_0+\beta_1 MAN_{it} + \beta_2 STATE_{it} + \beta_3 LEV_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 LEVMAN_{it} + \beta_7 SIZEMAN_{it} + \beta_8 LEVGROW_{it} + \beta_9 SYS_{it} + \beta_{10} UNSYS_{it} + \beta_{11} INDU_{1,it} +...+ \beta_{14} INDU_{4,it} + \beta_{15} GEOG_{it} + \beta_{16} FOWN_{it} + \beta_{17} TAXLOSS_{it} + \beta_{18} TAXRATE_{it} + \beta_{19} SUBSIDY_{it} + \beta_{20} LIQUID_{it} + \beta_{21} YEAR_{97} + \beta_{22} YEAR_{98} + \varepsilon_{it}$

Where the observable dummy variable $INSCHO_i$ is equal to 1 if the latent variable, $Y_i^*>0$, denoting a company with an insurance purchase; and 0 if $Y_i^* <=0$, denoting a company without an insurance purchase. Other variables are defined as previous.

2. Reported in the column of coefficient estimates in Table 3 are marginal effects of corresponding variable that are computed at the means of all observations (see LIMDEP version 7.0).

3. *** Statistically significant at the 0.01 ** Statistically significant at the 0.05. Where the predicted sign of a variable is uni-directional, one-tailed p-value is calculated; otherwise two-tailed p-value is reported.

potentially adversely affecting their job security. As a result, managers are more likely to purchase property insurance in highly indebted corporate states than would otherwise be the case when leverage is low. However, *SIZEMAN* is not statistically significant at conventional levels, suggesting that company size does not significantly affect the relation between managerial share ownership and property insurance participation decisions in the Chinese corporate sector.

As predicted, *TAXRATE* is found to be negative and statistically significant ($p \leq 0.05$, one-tailed). This appears to support the view that companies with more tax credits (and hence lower effective tax rate) are more likely to use property insurance in order to make full use of existing tax shields. Interestingly, *TAXLOSS*, however, is found to be unexpectedly related to the likelihood of insurance purchase ($p \leq 0.10$, one-tailed). This suggests that the convexity of tax position arising from the tax-loss carry-forwards does not effectively motivate the managerial purchase of property insurance in Chinese companies. One possible reason for this might be that Chinese managers are failing to recognize the existence of cumulative operating losses as a tax shield and the potential taxation advantages associated with hedging (in terms of the effective use of such tax shield). Alternatively, this negative relation between the existence of cumulative operating losses and property insurance participation could reflect that Chinese managers in (financially) poorly performing companies might be under pressure (e.g., from shareholders) to curtail business expenses including insurance.

Contrary to expectations (but consistent with the results of the correlation analysis), company size is found to have a positive and significant influence on a company's probability to purchase property insurance ($p \leq 0.10$, one-tailed). At first sight, this is counter-intuitive, as unlike hedging through derivatives trading, information and transaction cost-based scale economies are reported not to be pronounced in insurance transactions (Mayers and Smith, 1990). A possible explanation for this observation is that given the strong market competition and the

drive for market shares of premiums income in China, large companies could be more likely to be targeted by insurers than small companies.

Additionally, the insurance participation decisions of Chinese managers appear to vary according to industrial sector. Specifically, real estate ($INDU_2$) and conglomerate companies ($INDU_4$) are found to be less likely to purchase property insurance than companies from other industries ($p \leq 0.05$, one-tailed). This is not surprising because a large proportion of the assets of Chinese real estate companies are (statutorily) uninsurable land. Additionally, conglomerate firms can achieve risk diversification through multi-line business operation and thus, have less need for property insurance compared with other companies, all else being equal.

Also different from previously expected, *GEOG* is found to be negatively associated with property insurance participation decision, implying that Chinese publicly listed companies incorporated in inland regions have greater propensity to use property insurance than their counterparts in coastal areas. One possible reason is that compared with managers in companies located in the economically more developed Eastern costal regions, inland-based company managers might have few risk hedging alternatives to insurance (e.g., financial derivatives) and less expertise in risk management. Alternatively, in-land based companies may face a greater risk of asset loss – for example, due to generally poor loss prevention and/or inadequate safety systems. As a result, they tend to be more likely to rely on the usage of (potentially expensive) commercial insurance to manage asset-loss risk than other forms of hedging. Therefore, it is felt that this does not necessarily constitute counter-intuitive evidence for the reported greater risk management awareness of company managers in the coastal regions (Shi and Su, 2000).

While *STATE* and *GROW* are "correctly" signed, they are not statistically significant. Thus, there is no evidence to support the notion that State ownership could reduce the likelihood that company managers purchase property insurance. This could reflect the possibility that while delegating business operations to management, the State has neither the incentives nor the capability (e.g., due to information asymmetry) to monitor and effectively influence corporate risk management, including insurance

decisions (e.g., see Xu and Wang, 1999). Alternatively, the available financial assistance from the government may not be sufficient enough to effectively substitute for the use of commercial property insurance in managing asset-loss risks. Indeed, this is evidenced by the negative, but insignificant parameter estimation for *SUBSIDY*. Otherwise, corporate systematic and unsystematic risks and hedging substitutes are not found to have significant impacts on the propensity of Chinese listed companies to use property insurance. The insignificance of year dummies further suggests that there have not been (material) time-related changes regarding the managerial decision to participate into property insurance amongst the current sample of publicly listed Chinese companies.

The diagnostics presented in Table 6.5 include a χ^2 statistic for testing the null hypothesis that regression coefficients (excluding the intercept) are jointly zero. The computed χ^2 statistic allows one to reject this null hypothesis. A second χ^2 statistic is calculated using a Lagrange Multiplier (LM) test for heteroscedasticity that compares the estimated model with an alternative model that allows for multiplicative heteroscedasticity regarding *lnSIZE* in the disturbance term. The calculated χ^2 and associated p-values reject the null hypothesis, implying that heteroscedasticity is unlikely a severe problem in the probit model. Additionally, the calculated pseudo-R^2 values are around 0.50 indicating the limited predictive power of the probit models[67].

6.4.2 Volume Decision Model Results

The empirical linkage between the financial extent of property insurance use and the hypothesized firm-specific characteristics (i.e., equation 5.4 in Chapter 5, section 5.5.4) is examined by estimating a (two-way) fixed-effects panel model with Heckman's sample selection correction. Only those sample companies that purchased property insurance are included in this model (n = 593). The results are presented in Table 6.6.

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[67] The computed pseudo-R^2 measures the goodness of fit of the probit model (Zavoina and McElvey, 1975). That is, $R^2=var(Y_f)/[1+var(Y_f)]$, where $Y_f=E[Y^*|Y]$. Out of 593 company/year cases purchasing property insurance, 588 are correctly predicted; in contrast, out of 75 company/year cases not purchasing property insurance, 12 are correctly predicted. Therefore, the probit model is deemed to be quite successful in predicting the probability of purchasing property insurance; but it has limited predictive power in estimating the likelihood of not purchasing property insurance.

Table 6.6
Multivariate Results of Two-way Fixed-Effects Volume Decision Model with Heckman's Sample Selection Correction (panel data - 593 company/year observations)

This table presents the regression results of the volume model and associated diagnostics.

Panel A: Estimation Results

	Predicted Signs (+/-)	Coefficient Estimate	Standard Errors	t-stat	p-value
MAN	+	0.172	0.041	4.188	0.000***
STATE	-	0.039	0.050	0.784	0.216
LEV	+	0.043	0.048	0.890	0.187
GROW	+	0.081	0.032	2.553	0.005***
SIZE	-	-0.304	0.058	-5.226	0.000***
LEVMAN	+	-0.047	0.035	-1.351	0.088*
SIZEMAN	-	-0.056	0.030	-1.778	0.037**
LEVGROW	+/-	-0.028	0.022	-1.294	0.196
SYS	+	0.029	0.015	1.933	0.027**
UNSYS	+	-0.026	0.013	-2.035	0.021**
FOWN	+	0.508	0.225	2.260	0.012**
TAXLOSS	+	0.024	0.026	0.936	0.174
TAXRATE	-	0.023	0.024	0.960	0.168
SUBSIDY	-	-0.002	0.021	-0.073	0.470
LIQUID	-	0.001	0.035	0.033	0.486
λ	+/-	-0.073	0.102	-0.715	0.474
$YEAR_{97}$	+/-	-0.021	0.009	-2.439	0.015**
$YEAR_{98}$	+/-	-0.002	0.007	-0.333	0.739

Panel B: Diagnostics

Testing parameters are jointly zero: $F_{231,361} = 17.95$, p-value=0.000*** (one-tailed) Adjusted $R^2 = 0.87$

Wald test for a pooled OLS model versus a fixed-effects model, $F_{212,364} = 16.76$, is significant at 0.01 level (one-tailed), suggesting a heterogeneous fixed-effects model is superior to the pooled OLS model.

A LM test for a pooled OLS model versus a random-effects model, $\chi^2_{(2)} = 350.67$, is significant at 0.01 level (one-tailed), supporting that a heterogeneous random-effects model is superior to the pooled OLS model.

A Hausman test for a random-effects model versus a fixed-effects model, $\chi^2_{(16)} = 34.02$, is significant at 0.01 level (one-tailed), indicating that the unobservable firm-specific effects are correlated with the explanatory variables. Thus a fixed-effects model is better than a random-effects model.

White test of heteroscedasticity: $\chi^2_{(244)} = 392 > 298$ (critical value at 0.01 level, one-tailed), suggesting the presence of heteroscedasticity in the disturbance term. Consequently, the standard errors reported are computed using White's correction for heteroscedasticity.

Test for normality of residuals: Jarque-Bera test: $\chi^2_{(2)} = 51.00$, p-value = 0.000, indicating that normality is rejected.

Ramsey's RESET test for functional misspecification error for the volume decision model (order 3): $F_{2,360} = 1.040$, p-value = 0.356, indicating that no misspecification error cannot be rejected.

Source: Research Data

Notes:
1. The two-way fixed-effects model estimated in this study is:
$INS_{it} = \alpha_0 + \alpha_i + \gamma_t + \beta_1 MAN_{it} + \beta_2 STATE_{it} + \beta_3 LEV_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 LEVMAN_{it} + \beta_7 SIZEMAN_{it} + \beta_8 LEVGROW_{it} + \beta_9 SYS_{it} + \beta_{10} UNSYS_{it} + \beta_{11} FOWN_{it} + \beta_{12} TAXLOSS_{it} + \beta_{13} TAXRATE_{it} + \beta_{14} SUBSIDY_{it} + \beta_{15} LIQUID_{it} + \beta_{16} \lambda_{it} + \delta_{it}$
Where, α_i is time-invariant firm-specific effect dummies to capture the unobservable differences among companies; γ_t is firm-invariant period-specific effect dummies to capture any time-related changes; λ_{it} is the inverse Mill's ratio generated by the first-stage probit decision model to control for the possible sample selection bias in the volume decision model where only companies purchasing insurance are selected; δ_{it} is an error term that is assumed to have a zero mean and constant variance; $_{it}$ are the company/year observations over 1997-99. Other variables are defined in Table 5.2.
2. *** Statistically significant at the 0.01 ** Statistically significant at the 0.05 * Statistically significant at the 0.10. Where the predicted sign of a variable is uni-directional, one-tailed p-value is calculated; otherwise two-tailed p-value is reported.
3. Standard errors reported in the table are heteroscedasticity-consistent standard errors computed using White's correction for heteroscedaticity.
4. This high value of the adjusted R^2 is attributable to the inclusion of group-effects dummies. Dropping these dummies reduces the adjusted R^2 to roughly 0.20.

First, White's test is conducted to test for the presence of heteroscedasticity in equation 5.4. The computed χ^2 value (d.f. = 244) is statistically significant ($p \leq 0.01$, one-tailed), indicating the presence of heteroscedasticity in the volume decision model. Thus, the two-way fixed-effects model is re-estimated and reported using White's (1980) heteroscedasticity corrected covariance matrix in order to derive consistent parameter estimates.

Consistent with what was hypothesized (H1b), the coefficient for *MAN* is found to be positive and statistically significant in the volume model ($p \leq 0.01$, one-tailed). This finding suggests that managers with relatively high levels of (insider) share ownership are more likely to be engaged in hedging company asset risks via the use of property insurance than their counterparts with relatively low levels of insider ownership. This observation is also consistent with Smith and Stulz (1985)'s *managerial risk-aversion* hypothesis, but inconsistent with the *managerial incentive-alignment* hypothesis reported in Chen et al. (2001). Moreover, it is worth noting that, however, this result is contrary to the evidence documented in some prior US-based studies (e.g., Hoyt and Khang, 2000). This is not necessarily surprising because with the generally low levels of insider ownership in publicly listed Chinese companies (Sun et al., 2002), managerial interests may not be effectively aligned with those of shareholders. This is because relative to their Western counterparts, Chinese managers tend to have less diversified personal wealth outside firms (Sun et al., 2002). They are

therefore likely to be more risk averse when their economic interests are heavily vested in firms compared with managers in Western companies. As a result, Chinese managers are likely to purchase property insurance to reduce potential asset losses and decrease the risk of financial distress (thereby enhancing their future job security).

The negative and statistically significant ($p \leq 0.10$, one-tailed) interaction term between *MAN* and *LEV* indicates that the relation between *MAN* and the volume of property insurance purchased appears to decrease as *LEV* increases. This finding suggests that even if a company manager has decided to purchase property insurance (e.g., because he/she is risk averse), the decision regarding the amount of property insurance purchased can be affected by other factors (e.g., the severe cash flow constraints facing by highly levered companies) (Haushalter, 2000). As a result, it is plausible for managers in highly levered companies (despite any possible insider shareholdings) to curtail operating expenses (including insurance) in order to meet their obligations under debt contracts. As such, the negative coefficient for interaction between *MAN* and *LEV* does not necessarily run contrary to the *managerial risk-aversion* hypothesis. Consistent with Hoyt and Khang (2000), *SIZEMAN* is found to be negative and statistically significant ($p \leq 0.05$, one-tailed). This implies that the relation between managerial ownership and the volume of property insurance purchased appears to decline as companies grow in size. This observation provides some support for the notion that managers in small companies are likely to face greater business risks because it is more difficult for them to diversify their human capital compared with their counterparts in large companies. This result is thus interpreted to be consistent with the *managerial risk-aversion* hypothesis.

Contrary to hypothesis H3b, the coefficient for *LEV* is not statistically significant in the volume decision model. This implies that though major creditors (e.g., commercial banks) may require collaterized assets to be insured, the level of property insurance coverage does not appear to give them adequate *ex-ante* protection against *ex-post* asset losses. Therefore, it is plausible that in China neither creditors nor company managers are able to use property insurance to mitigate effectively agency problems (e.g., underinvestment and asset substitution problems) between debtholders and shareholders/managers. This could reflect that company managers

and/or those banks providing commercial loans may be under-estimating the probability/magnitude of potential asset losses (e.g., because of a lack of information and/or inadequate expertise in risk assessment). Indeed, Leung and Young (2002) report that Chinese banks are only recently starting to introduce sound risk assessment/management procedures on credit exposures. Additionally, the observed insignificance of *LEV* could be due to the possibility that managers in companies with high default risk may seek to reduce expenditure on insurance in order to generate sufficient cash flow to pay debt obligations (Whited, 1992; Haushalter, 2000). Browne and Hoyt (2000) further report that the "charity hazard" phenomenon could explain why insureds do not fully insure against fortuitous losses given that financial support can be obtained from other sources (e.g., the government). Indeed, given the substantial presence of State ownership in the current sample of Chinese firms and the key economic role played by publicly listed companies in national/local economy, "charity hazard" effects are possible. The negative relations between *STATE*, *SUBSIDY* and the likelihood of purchasing property insurance seem to be consistent with this explanation (e.g., see Table 6.5). However, I did not find statistically significant evidence on this substitutive effect.

Consistent with hypothesis (H4b), *GROW* is found to be positive and statistically significant ($p \leq 0.01$, one-tailed). This result suggests that companies with high growth opportunities appear to use more property insurance in order to mitigate severe agency problems arising from high growth opportunities between debtholders, shareholder and managers.

It is interesting to note that *SIZE*, which appears to have a positive influence on the insurance participation decision, is now negative and statistically significant as expected ($p \leq 0.01$, one-tailed). This finding is consistent with the findings of prior studies (e.g., Hoyt and Khang, 2000), thus suggesting that small Chinese companies appear to purchase relatively greater amounts of property insurance coverage than their large counterparts given their potentially greater susceptibility to business risks. In contrast, large Chinese companies could be realizing economies by selectively retaining some (e.g., high frequency/low magnitude) risks and insuring other (e.g., low frequency/high magnitude) risks via the commercial insurance market.

Of the control variables used in this study, *SYS* is now positive and significant ($p \leq 0.05$, one-tailed). This indicates that Chinese companies facing greater systematic risk – for example, from flood, earthquake and other environmental catastrophe risks – appear to buy more property insurance than companies with low systematic risk. Therefore, Chinese managers could perceive that increasing property insurance coverage is a cost-effective solution to potentially severe market risk exposure (such as a severe flood in the environmentally high-risk Yangtze River basin). Also consistent with what was expected, *FOWN* is positive and statistically significant ($p \leq 0.05$, one-tailed). This implies that companies with a (relatively) greater degree of foreign ownership tend to purchase more property insurance than domestically owned companies. This could reflect differences in the risk/return preferences of foreign shareholders and domestic investors. However, *UNSYS* is unexpectedly negative and statistically significant at the 0.05 level (one-tailed). This implies that managers in many Chinese companies might be under-insuring unsystematic (asset-loss) risks (e.g., fire damage) through risk retention strategies rather than using (potentially costly) commercial property insurance solutions. Indeed, Browne and Hoyt (2000) recognize that managerial perceptions of risk and insurance (and even the severity of past loss) could have an important impact on the demand for flood insurance in the US. Similarly, in emerging economies such as China, problems associated with company managers' (accurately) assessing risk exposure and recognizing the post-loss financing capabilities of property insurance could be exacerbated by generally low entrepreneurial ability/and risk management expertise.

Different from what was hypothesized (H2b), State ownership was not found to have statistically significant influences on the volume decision of property insurance usage. Therefore, I find no support for the possible substitutive linkage between the level of State ownership and the use of property insurance. The taxation variables and hedging substitutes were also found not to be significant determinants of the amount of property insurance purchased by Chinese publicly listed companies. Finally, the negative and statistically significant $YEAR_{97}$ ($p \leq 0.05$, two-tailed) could reflect economic difficulties experienced by Chinese companies at the time of the

Asian financial crisis in 1997 and the resultant decline in the amount of property insurance purchased.

6.5 SENSITIVITY TESTS AND FURTHER DIAGNOSTICS

This section of the thesis examines the efficiency of the property insurance participation and volume decision models to various sensitivity tests and a battery of diagnostics checks.

6.5.1 Sensitivity Tests

First, I examine the sensitivity of *SIZE* by replacing the book value of total assets with annual sales income; the results are similar and so they are reported separately.

Next I test for the possibility that the extent of property insurance usage in the current sample of Chinese companies could be affected by their cash flow situation. I partition the sample of insuring companies into two groups – those with and without cash flow constraints. A company is defined as having constrained cash flow if it is above the 75 percentile of the sample leverage (i.e., 1.40) and concomitantly below the 25 percentile of internal cash balance (i.e., 0.16). A company's internal cash balance is measured by the amount of year-end cash and cash equivalents (e.g., short-term bank deposits) scaled by total assets. I then conduct both a Student's t-test and a Mann-Whitney U-test to compare the level of *INS* between the above two groups. In both tests, the computed t- and z- statistics are negatively significant at the 0.01 level (one-tailed), thus implying that Chinese companies with cash flow constraints tend to purchase property insurance to a lesser extent than companies without cash flow constraints. This finding thus lends some support for the notion that while facing severe cash-flow constraints, managers might cut back business expenditure (including insurance premiums) in order to meet obligations under debt contracts (Haushalter, 2000). It could also help to explain the observed non-proportionate relation between leverage and the amount of property insurance usage in the Chinese corporate sector.

6.5.2 Diagnostics

In addition to the diagnostics reported in Tables 6.5 and 6.6, some other diagnostic checks are also performed.

The use of property insurance as a risk management mechanism may change simultaneously a company's risk-profile – that is, there might be a two-way causal linkage between *INS* and *SYS*, *UNSYS* and *LEV*. If this is the case, then the derived regression estimates reported in section 6.4 could be biased and inconsistent. Therefore, as suggested in Maddala (1992, p.395), I perform an omitted-variable version of the Hausman specification test to investigate the endogeneity of the three corporate risk measures (i.e., *SYS*, *UNSYS* and *LEV*) used in the analysis. First, I introduce three instrument variables - *MARSD* (the annual standard deviation of market return), *PHY* (the proportion of physical assets in total assets) and *INTCOV* (interest cover - the ratio of annual interest expenses incurred to earnings before interest and tax (EBIT)) - as correlated variables for the systematic, unsystematic and insolvency risks (i.e., measured by *LEV*), respectively. However, these instrument variables are not directly influenced by property insurance usage[68]. Second, I replace these three risk measures with their instruments in the probit model to re-generate the inverse Mill's ratio for the use in the volume decision model. Third, I regress the three risk measures on all the exogenous variables (i.e., *MARSD*, *PHY*, *INTCOV*, the inverse Mill's ratio, fixed-effects and all other variables previously included in the model) to derive fitted values as their refined instruments. Fourth, the volume decision model is re-estimated by regressing *INS* on the three corporate risks measures, their refined instrument variables and all other variables. A F-test, with the null hypothesis that the coefficients of three instrument variables are jointly zero, is then conducted. The computed F-statistic ($F_{3, 359}$ = 1.427) is insignificant at the 0.10 level (one-tailed). Therefore, no evidence is found to reject the null hypothesis that

[68] *MARSTD* is the benchmark for computing company betas; *PHY* could proxy for a firm's unsystematic risk related to potential physical asset losses; *INTCOV* could proxy for a firm's insolvency risk. Both *MARSTD* and *PHY* are exogenous relative to corporate property insurance usage. While property insurance may (potentially) increase debt and thereby increasing interest expenses, the presence of insurance may also lead creditors to lower the rate of interest charged. Additionally, *INTCOV* is also affected by EBIT. Therefore, the relation between *INTCOV* and insurance usage is unwarranted and so I feel that it is reasonable to assume that *INTCOV* is contemporaneously uncorrelated with the error term.

SYS, *UNSYS* and *LEV* are contemporaneously uncorrelated with the error term. In other words, simultaneous-equation (endogeneity) bias is unlikely to be a serious problem in this study.

Second, the normality of residuals for the volume decision model is tested using the Jarque-Bera (J-B) statistic and the null hypothesis of normally distributed errors is rejected (χ^2 = 51.0, p≤0.01, d.f.=2) (see Table 6.6). Visual inspection of the distribution of residuals suggests that the main problem is kurtosis (peakedness) rather than skewness. Non-normality (kurtosis) thus remains as unavoidable limitation with the research design employed.

As recommended by Kennedy (1998, p.98), I further perform a Ramsey's regression specification error test (RESET) to examine whether the multivariate modeling procedure suffers from functional misspecification error and/or omitted variable bias. I regress the residuals from the volume decision model on the independent variables and the square/cubic of the fitted dependent variable. The null hypothesis of no omitted variables cannot be rejected at the 0.10 level or less ($F_{2,360}$ = 1.04, one-tailed). Kennedy (1998) further reports that the RESET test is useful for detecting non-linearity in the data. The lack of significance of the RESET statistic, however, suggests that the linear specification adopted in this study is appropriate.

6.6 LINKAGE BETWEEN THE VOLUME DECISION AND NON-METRIC CONTROL VARIABLES

I also perform a series of two-sample parametric/non-parametric tests to determine the empirical linkage between the extent to which companies use property insurance and the time-invariant control variables (*GEOG* and *INDU*) that are not included in the fixed-effects volume decision model.

First, a Student's t-test (one-tailed) is performed to compare the means of *INS* among companies grouped by *GEOG* (see Table 6.7). Consistent with the results shown in Table 6.3, it is found that managers of companies located in China's Eastern coastal regions appear to purchase less amount of property insurance than their

counterparts of companies incorporated in inland regions ($p \leq 0.05$, one-tailed). However, to avoid the undue influence of possible extreme values on test results, a non-parametric Mann-Whitney U-test is also conducted to compare the medians of the volume of property insurance spending (*INS*) across sub-groups that are classified by *GEOG*. The results are consistent with the t-test results ($p \leq 0.01$, one-tailed) (see Table 6.7). Again, this suggests that managers in economically less developed inland-based Chinese companies may be less aware of risk management alternatives to insurance (e.g., financial derivatives) than their counterparts in more developed coastal locations such as Beijing and Shanghai.

Table 6.7
Inter-Group Comparison of Volume of Property Insurance Use (*INS*)
(pooled data – 593 company/year observations)

This table gives the results of inter-group comparison of the volume of property insurance use for non-metric *GEOG* and *INDU*.

Panel A: Volume of Property Insurance Use (*INS*) Across Subgroups

VARIABLES		Cases	Mean %	Std. Dev.
GEOG	0	227	0.342	0.004
	1	366	0.262	0.005
INDU	1	97	0.207	0.003
	2	26	0.067	0.001
	3	33	0.436	0.007
	4	60	0.178	0.004
	5	377	0.326	0.005

Panel B: Independent Sample t-tests of Mean Difference and Mann-Whitney U-tests of Median Difference Between Subgroups

VARIABLE PAIRS		t-test				Mann-Whitney U Test
		Mean Difference%	Std. Dev. Difference	t-ratio	p-value	z-statistic
GEOG	0-1	0.079	0.0004	2.069	0.020**	5.155***
INDU	1-2	0.139	0.0003	4.313	0.000***	4.417***
	1-3	-0.229	0.0012	-1.924	0.031**	-1.848**
	1-4	0.029	0.0005	0.580	0.281	1.933
	1-5	-0.119	0.0004	-3.162	0.001***	-2.342***
	2-3	-0.369	0.0012	-3.166	0.001***	-4.260***
	2-4	-0.111	0.0005	-2.220	0.015**	-2.727***
	2-5	-0.258	0.0003	-9.204	0.000***	-5.156***
	3-4	0.258	0.0010	2.580	0.006***	2.658***
	3-5	0.110	0.0010	0.935	0.178	0.701
	4-5	-0.148	0.0005	-2.960	0.002***	-3.535***

Source: Research Data

Notes:
1. ***GEOG*** = geographical location – dummy variable taking 1 for coastal zones and 0 for inland zones; ***INDU*** = industry category variable, service = 1; real estate = 2; utilities = 3, conglomerate = 4; manufacturing = 5.
2. *** Statistically significant at the 0.01 level (one-tailed)
** Statistically significant at the 0.05 level (one-tailed)

Additionally, a Kruskal-Wallis one-way analysis of variance is conducted to compare the difference between the median of *INS* across different industries. The test is significant at the 0.01 level (one-tailed with four d.f.), suggesting that the level of property insurance spending varies across industrial sectors. Student's t-tests are then carried out to compare the mean of amount of insurance purchases between paired industry groupings. Additionally, non-parametric Mann-Whitney U-tests between each paired industries are performed as a robust check. As Table 6.7 shows clearly, the results from the t-tests and Mann-Whitney U-tests are generally consistent except for the retail–conglomerate pair. Specifically, it is found that as expected, Chinese manufacturing and utilities companies are likely to insure their assets to a greater extent than other companies. The finding concerning regulated utilities is consistent with that reported in Yamori (1999), but inconsistent with Hoyt and Khang (2000). In contrast, real estate companies appear to purchase less property insurance than other companies probably because their major assets in China are (statutorily) non-insurable land. Also, conglomerate companies are more likely to diversify their business risks through multi-line strategy and hence, they appear to purchase less property insurance than manufacturing, regulated utilities and retail firms. However, no statistically significant differences in property insurance purchases among manufacturing and utilities companies are detected from the data.

6.7 CONCLUSION AND SUMMARY

This chapter tests the five major hypotheses and several control variables that are formulated in Chapter 4 using a panel dataset from 235 publicly listed Chinese companies for the period 1997-99. The empirical results obtained from the statistical procedures as described in Chapter 6 are reported and discussed in this chapter.

Consistent with what was hypothesized, I find that managerial propensity to purchase property insurance by Chinese publicly listed companies is positively related

to leverage and company size. Additionally, managerial ownership and leverage are found to interact each other to influence the likelihood of purchasing property insurance by publicly listed Chinese companies. Specifically, given a certain level of managerial ownership, managerial propensity to purchase property appears to increase with the level of leverage. As discussed previously in section 4.2, managerial ownership and leverage could influence corporate decisions to purchase property insurance because they are related to owner-manager and shareholder-debtholder incentive conflicts. Therefore, the above findings provide some support for agency theory based motivations for the corporate purchase of insurance. However, mixed evidence is found regarding the effect of (convex) taxation schedule on the corporate purchase of property insurance. For example, the presence of tax credits (manifest in low effective taxation rates) appears to motivate Chinese managers to purchase property insurance in order to decrease the volatility of future annual earnings and thereby reduce the expected present value of taxation. However, another type of convexity in corporate taxation arising from the existence of operating loss carry-forwards is not found to have positive influence on managerial propensity to use property insurance. It is plausible that such tax convexity is not recognized as being financially important by Chinese managers. Rather, the existence of operating loss carry-forwards could be interpreted as a binding financial condition, thereby forcing Chinese managers to curtail business expenses (including property insurance spending). It is also found that the decision of Chinese managers to insure appears to vary from industry to industry and geographical location. Real estate and conglomerate firms are found to be less likely to purchase property insurance than other entities. Companies incorporated in economically less developed inland regions appear to have greater propensity to purchase property insurance than their counterparts in more prosperous Eastern coastal regions. However, contrary to what was expected, growth options, risk profiles, the presence of State and foreign ownership and hedging substitutes do not appear to be important determinants of the property insurance participation decision in the Chinese corporate sector.

From the volume decision model, it is found that consistent with what was hypothesized, the volume of property insurance purchased is positively related to the level of managerial ownership, growth opportunities, systematic risk and the level of foreign ownership, but inversely linked to company size and unsystematic risk.

Additionally, as expected, given certain level of managerial ownership, the volume of property insurance purchased appears to decline as a company grows in size and increases in leverage. These findings again provide support for the hypotheses that agency theory-based factors (e.g., growth options and managerial ownership) are important determinants of the volume decision of property insurance in the Chinese corporate sector. However, the inverse and/or insignificant relations found between unsystematic risk, leverage and the volume of property insurance use suggest that many Chinese managers might be under-insuring their asset-loss risks. One reason for this observation might be the existence of severe cash flow constraints in many Chinese companies. It is also plausible that managers and/or other contracting parties (notably commercial banks) are underestimating the probability/magnitude of potential asset losses. This may be due to a lack of expertise and/or unsophisticated underwriting procedures in Chinese banks. Otherwise, State ownership and taxation do not appear to be important determinants of the amount of property insurance purchased. The main conclusions, implications of this study and prospects for future research are evaluated in the next and final chapter of this thesis.

CHAPTER 7: SUMMARY AND CONCLUSIONS

7.1 INTROUDUCTION

This final chapter summarizes the research project and presents the main conclusions arising from the study. Additionally, the contribution to knowledge made by this project is assessed and its limitations are highlighted. Prospective areas for further research are also considered.

7.2 OVERVIEW OF THE PROJECT

Prior studies (e.g., Mayers and Smith, 1982; Main, 1983) identify differences in the motivations between the individual and corporate purchase of insurance. Such studies concluded that risk aversion by owners cannot by itself satisfactorily explain the insurance purchases by large and widely-held companies. The reasoning is that in frictionless (efficient) capital markets, it is more cost-effective for shareholders to diversify (firm-specific) unsystematic risks by holding a balanced portfolio of investment rather than for the company in which they invest to purchase insurance. Therefore, the purchase of commercial insurance by large and widely-held companies does not seem, at first sight, to be warranted. To resolve this apparent puzzle, researchers have used financial economics-based theories (e.g., agency theory) to identify other factors that might help to explain managerial insurance decisions in large and widely-held companies. However, empirical evidence supporting these theoretical predictions is hitherto limited, particularly in emerging economies. Motivated by the dearth of empirical evidence on the corporate purchase of property insurance in China - a major emerging economy - this research project thus attempts to isolate those determinants that could both influence: (a) managerial decisions to purchase property insurance and (b) the extent to which property insurance is used by Chinese publicly listed companies (see Chapter 1, section 1.2).

In the newly partially privatized Chinese corporate sector, share ownership is reported to be heavily concentrated in the State and a few institutional investors compared with the ownership structure of companies in many Western countries such

as the US and UK (e.g., see Xu and Wang, 1999). Additionally, shares held by the State and Chinese institutional investors are currently not publicly tradable. As a consequence, in China investors' portfolios are likely to possess a high degree of systematic and unsystematic risks. The generally less developed financial markets in China (e.g., with regard to the absence of sophisticated derivatives markets) also leave indigenous managers with fewer risk management options compared with those available to their counterparts in developed countries (e.g., the US). Therefore, ostensibly, insurance could be relatively more important to the risk management of Chinese corporations than to companies operating from more developed countries. Indeed, this view is supported by the high proportion (about 85 percent) of companies purchasing property insurance in the data set used in this study. The Chinese corporate insurance market is also tightly regulated by the CIRC. Among other things, the CIRC imposes a set of nationally universal benchmark premium rates and risk-rating rules. This implies that variations in the annual premiums incurred by PRC-based publicly listed companies are more likely to reflect the degree of managerial discretion over insurance purchases rather than sharp movements in external market prices and insurers' underwriting practices. This institutional feature also means that the insurance decisions of Chinese managers are likely to be mainly influenced by firm-specific structures and economic incentives rather than by external factors such as regulation. It is considered that this is an important institutional advantage for this project as it enables more robust tests of the agency theory-based hypotheses to be performed (see Chapter 2, section 2.5).

Chapter 3 of this thesis reviews critically the positive-descriptive-type theories and hypotheses in the financial economics literature that could be utilized to address the stated aim of the study. From the literature review, agency theory is identified as the most appropriate and viable framework to direct the empirical part of this project (see Chapter 3, section 3.3). Drawing a framework from agency theory, this study therefore puts forward five key hypotheses in Chapter 4 (section 4.2) regarding the determinants of propensity and the financial extent of property insurance use by Chinese publicly listed companies. These hypotheses include managerial share ownership, State shareholdings, leverage, investment opportunity set and company size. Also, several other factors (e.g., three interaction effect terms and corporate risk-profile) that have potential influence on the corporate use of property insurance are

also controlled for in this study. The motivation for these control variables is also outlined in Chapter 4 (sections 4.3-4.4).

In view of the data access constraints that preclude the application and use of supplementary field-based techniques (e.g., mail survey questionnaires or personal interviews) in China, statistical analysis is employed to test empirically the five main hypotheses derived from agency theory. Statistical tests are considered to have the advantages of being scientifically rigorous and generalizable. The research design is covered in Chapter 5 (sections 5.3-5.5) of this thesis. The results subsequently derived from the statistical testing of data obtained from the 1997-99 panel data of 235 Chinese publicly listed companies are presented in Chapter 6 (sections 6.2-6.6). Overall, the analysis of the empirical evidence reported in this thesis suggests that agency theory is an intuitively useful framework for explaining the corporate purchase of property insurance in the Chinese corporate sector.

7.3 MAIN CONCLUSIONS AND IMPLICATIONS

Three main conclusions arise from the analysis of the empirical results obtained in this study. These conclusions and their implications are as follows.

First, agency theory-based incentives appear to be important determinants of the corporate purchase of property insurance in China. Specifically, this study finds that, consistent with what was hypothesized, the likelihood of Chinese publicly listed companies using property insurance is positively related to leverage. This could reflect creditors' "me-first" rules that require collateralized assets to be insured in order to give lenders *ex-ante* protection against potential losses *ex-post*. Additionally, this study finds that, as expected, the extent of property insurance usage is positively related to the level of managerial share ownership and a firm's investment opportunity set. These findings suggest that in addition to debtholders' "me-first" rules, managers' risk aversion (e.g., arising from their concerns over job security and ill-diversified personal wealth) appears to be another important factor that determines the amount of property insurance taken out by Chinese companies. The observed positive linkage between a firm's growth options and the level of property insurance usage could also

reflect the intention of debtholders, managers and/or shareholders to use hedging mechanisms (e.g., the purchase of property insurance) in order to mitigate acute information asymmetries and associated agency problems in companies with high growth options. Again, this possibility is consistent with the agency theory framework.

Moreover, this study finds that some of the agency theory-based determinants could interact with each other to exert a joint influence on the corporate purchase of property insurance. For example, the (positive) impact of managerial ownership on the likelihood of purchasing property insurance is found to increase with the level of leverage. This suggests that managers owning a certain level of equity could have greater incentives to use property insurance in order to reduce the risk of financial distress associated with the increasing use of risky debt. I also find that after controlling for levels of managerial ownership, small companies appear to use a proportionately greater amount of property insurance than their large counterparts. One plausible reason for this is that managers of small firms often find it more difficult to diversify their personal risk (e.g., job security) than their counterparts in large firms. All these findings are considered to be consistent with agency theory. Overall, therefore, I conclude that agency theory has intuitive appeal as a framework for this study.

Second, I find that other firm-specific characteristics could also influence the property insurance decisions of managers of Chinese publicly listed companies. For example, the likelihood and extent of property insurance usage appears to vary from industry to industry and geographical location. Specifically, real estate and conglomerate firms are less likely to use property insurance to manage their asset loss risk than firms in other industries. Moreover, if real estate and conglomerate firms do participate into property insurance usage, they tend to use less amounts of property insurance than other firms. In contrast, regulated utilities and manufacturing firms are likely to purchase more property insurance than other firms (relative to the size of their asset-base). Disparity in the level of economic development among different geographical regions also appears to have an impact on corporate insurance decisions. In particular, I find that companies incorporated in economically less developed inland regions appear to have greater propensity to purchase more property insurance than their counterparts in more prosperous Eastern coastal regions. Other non-agency-

theory based factors - for example, corporate taxation rate – could also influence managerial hedging decisions in the Chinese corporate sector. In this study, a low taxation rate normally denotes the existence of tax credits. Therefore, the observed statistically significant and negative linkage between managerial propensity to use property insurance and taxation rate indicates that property insurance could be used to maximize the present value of tax shields, thereby increasing firm value.

The third main conclusion is that evidence regarding some of the explanatory variables derived from the insurance participation and volume decision models are, however, inconsistent. For instance, leverage plays a positive role in the insurance participation decision, but it is found not to have a statistically significant influence on the amount of property insurance purchased. Additionally, given a certain level of insider shareholding, the managerial propensity to purchase property insurance is likely to increase with the level of leverage; however, the amount of property insurance usage is found to decrease with leverage. I also find an inverse relation between the level of unsystematic risk and the volume of property insurance usage, which is contrary to what was predicted. I consider that low free cash flows and financial constraints (which are reported to be particularly pronounced in highly levered companies in emerging economies), could (at least partially) help to explain the above inconsistencies (see Chapter 6, section 6.5). In other words, the property insurance volume decision in many (highly levered) Chinese companies could be constrained by internal cash flows and bounded by covenants contained in debt contracts. Not surprisingly, therefore, many Chinese managers could be under-insuring their asset-based risks. Another plausible reason is that company managers and/or those banks providing commercial loans may be under-estimating the possibility/magnitude of potential assets losses (e.g., because of a lack of information and/or inadequate expertise in risk assessment).

7.4 CONTRIBUTION OF THE RESEARCH PROJECT

This research project has provided insights into the determinants of discretionary purchase of property insurance by publicly listed companies in the PRC. In the light of the hypotheses development, methodology employed and the empirical

evidence obtained, seven major contributions of this research project classified under two broad headings - regulatory/policy-making and empirical/methodological – are considered to arise from this project. These are outlined as follows.

7.4.1 Regulatory/Policy-making

I consider that the findings of this study have four major implications for various groups that have an interest in regulation/policymaking in the Chinese corporate sector (and emerging insurance markets generally).

First, combining the findings regarding leverage from the participation and volume decision models, it appears that in China, lenders of fixed claims debt are requiring company managers to procure property insurance as coverage for collateralized assets as a condition for issuing loans. However, the result of this study suggests that the level of such creditor-induced *ex-ante* insurance coverage may not be sufficient to fully compensate creditors for fortuitous losses *ex-post*. Therefore, creditors (like banks) may have to monitor more closely the risks and risk management practices of Chinese companies. This is also likely to be an issue of relevance for industry regulators.

Second, it is reported in the literature that the primary intention of introducing insider share ownership in the Chinese corporate sector is to motivate company managers to act in the interests of shareholders (Xu and Wang, 1999). However, the results of this study suggest that corporate risk hedging in China could reflect managers' risk aversion (e.g., with regard to their concern over economic interest and job security) rather than the maximization of shareholders' wealth. Indeed, this is particularly germane given that recent empirical evidence from the US suggests that corporate risk management initiatives often fail to deliver the expected welfare gains for shareholders, but rather provide economic advantages for managers (May, 1995). Therefore, shareholders and/or policymakers may need to evaluate existing managerial incentive schemes in Chinese publicly listed companies to ensure that the economic interests of managers and shareholders are more closely aligned.

Third, the findings of this study could also have important commercial implications for Chinese managers. For example, my results suggest that Chinese company managers may not appreciate fully the (direct and indirect) costs of financial distress arising from increased leverage and the role that insurance can play in alleviating such costs. Also, it is plausible that many Chinese managers may fail to realize that in addition to tax credits, the presence of substantial amount of tax-loss carry-forwards is an important tax shield whose present value can be maximized by hedging (e.g., through property insurance). Therefore, this observation underpins the need for further financial (risk) management education and training in the Chinese corporate sector.

Fourth, the empirical relation that appears to exist - for example, between company size, industry sectors, geographical location, foreign ownership and the corporate purchase of property insurance in China - could help insurance suppliers (including foreign insurers operating in the PRC) to better target potential insurance customers. For instance, insurers may wish to more closely reflect on the risk management needs of inland-based companies and small enterprises in their product innovation and marketing strategies. Additionally, foreign-invested enterprises may prospectively become important in stimulating demand for property insurance in the Chinese insurance market. This is particularly the case given that China's entry into the WTO is likely to stimulate further growth in foreign direct investment in China (and hence increase the demand for corporate insurance) (Shen, 2000).

7.4.2 Empirical/Methodological

Additionally, I contend that this research project contributes three major empirical/methodological advances to the academic literature as follows.

First, this study is believed to be the first to use firm-level panel data to investigate empirically the linkage between the corporate purchase of property insurance and firm-specific characteristics motivated by agency theory. One salient advantage of using a panel data design is its ability to control for unobserved firm-specific effects (e.g., inter-company differences in risk management expertise) that

cannot be controlled for in a single-period cross-sectional study. This enables more robust results to be derived.

A second empirical/methodological advancement on previous (developed economy-based) studies (e.g., Yamori, 1999; Hoyt and Khang, 2000) is that I employ a two-stage analytical approach and demonstrate that determinants of insurance participation and volume decisions can be different. For instance, the insurance volume decisions of managers can be affected by other factors (e.g., firms' cash flow constraints), which have not been identified or stressed in previous studies. This approach helps to generate more informative insights into the corporate insurance decisions of managers. Moreover, compared with previous studies (e.g., Hoyt and Khang, 2000), this research project directly controls for the influence of firms' systematic and unsystematic risk-profiles and industry factors on managerial insurance decisions.

Third, it is believed that this is the first empirical study of its kind conducted in a major emerging economy - China. Therefore, insights into the linkages between discretionary corporate purchase of property insurance and managerial ownership, leverage, growth options, size, risk-profile and so on, which have been gained from this study, could be usefully generalized to future studies conducted elsewhere. For example, the methodological approach and results of this study could also help to stimulate further academic research into the demand for insurance in other emerging economies (e.g., India and Vietnam).

7.5 LIMITATIONS OF THE STUDY

Like many other empirical studies, conclusions drawn from this study should, however, be tempered by the recognition of some limitations with the research design. Apart from the general constraints inherent in all research projects (e.g., with regard to data quality), the following three limitations specific to this research project deserve attention. First, given the nascent and volatile stock markets in China, market-based proxies used for many variables (e.g., corporate growth options) could be mis-measured ("noisy"), particularly given the short time series data used (1997-99) in

this study. Second, though I take rank transformations of (metric) variables, the residuals from the volume decision model still suffer from the non-normality problem (due to kurtosis). Therefore, for this reason, some caution in interpreting the results is advised. Third, as Brown and Hoyt (2000) note, some behavior-related factors – e.g., managers' past experience of risk and their changing perceptions of potential losses – could also have impact on corporate insurance decisions[69]. However, these factors are difficult to model directly in the current analysis due to the absence of relevant data.

7.6 AREAS FOR FUTURE RESEARCH

There are several prospective areas for future research highlighted by the results of this study. First, further tests using longer time-series of panel data are needed, particularly on the role of the State ownership in corporate insurance decisions. Though I observed a negative influence of State ownership on the managerial propensity to participate into property insurance and similarly, an inverse linkage between the level of government subsidies and the propensity/volume of property insurance usage, this substitutive relation is statistically insignificant. As a result, it is not conclusive as to whether there is a State-induced "charity hazard" in the Chinese corporate sector. However, this issue is important because the existence of State-induced "charity hazard" effects could substitute for the use of commercial insurance and decrease the managerial need to hedge business risks (also see Chapter 4, section 4.2.2). Second, future research should attempt to incorporate other potentially relevant variables into the analysis of corporate hedging decisions when appropriate data become available. Potentially interesting factors may include managers' past risk experiences (or firms' historical loss experiences), more accurate industry classification (e.g., a more refined breakdown of manufacturing firms), firms' production diversification strategy as hedging substitutes (which requires segmental reporting data) and the risk management role of independent directors on the board. Research in such areas could yield interesting insights and contribute to improving our understanding of risk management practices in China and other

[69] If these behavioural effects are time-invariant and permanent, they can be controlled for by incorporating firm-specific effect dummies in model. However, a fixed-effects model is not able to control for changing managerial perceptions of potential losses based on past experiences of risk.

potentially important emerging Asian markets such as India and/or former Soviet countries such as those in Eastern Europe.

REFERENCES

A. M. Best. 1999. *1999 Best's Insurance Reports - International.* NJ: Oldwick.

Abdel-khalik, A.R., Wong, K.A. and Wu, A. 1999. The Information Environment of China's A and B Shares: Can We Make Sense of the Numbers? *International Journal of Accounting* 34(4): 467-489.

Accounting Standards for Business Entities. 1993. Beijing: Ministry of Finance, China.

Accounting System for Joint-stock Companies. 1993. Beijing: Ministry of Finance, China.

Adams, M.B. 1997. A Note on the Asset-Specific Nature of Life Insurance Firms. *Journal of Interdisciplinary Economics* 8(3): 167-176.

Adams, M.B. and Hardwick, P. 1998. An Analysis of Corporate Donations: United Kingdom Evidence. *Journal of Management Studies* 35(5): 641-654.

Adams, M.B. and Hillier, D. 2000. The Effect of Captive Insurer Formation on Stock Returns: An Empirical Test from the United Kingdom. *Journal of Banking and Finance* 24(11): 1787-1807.

Admati, A., Pfleiderer, P. and Zechner, J. 1994. Large Shareholder Activism, Risk Sharing, and Financial Market Equilibrium. *Journal of Political Economy* 102(6): 1097-1130.

Aharony, J., Li, C.J. and Wong, T.J. 2000. Financial Packaging of IPO Firms in China. *Journal of Accounting Research* 38(1): 103-126.

Anderson, S.W. and Lanen, W.N. 1999. Economic Transition, Strategy and the Evolution of Management Accounting Practices: the Case of India. *Accounting, Organizations and Society* 24(5-6): 379-412.

Argote, L. 1982. Input Uncertainty and Organizational Coordination in Hospital Emergency Units. *Administrative Science Quarterly* 27(3): 420-434.

Ashby, S.G. and Diacon, S.R. 1998. The Corporate Demand for Insurance: A Strategic Perspective. *Geneva Papers on Risk and Insurance: Issues and Practice* 23(86): 34-51.

Astley, W.G. and Van de Ven, A.H. 1983. Central Perspectives and Debates in Organization Theory. *Administrative Science Quarterly* 28(2): 245-273.

Baiman, S. 1990. Agency Research in Managerial Accounting: A Second Look. *Accounting, Organizations and Society* 15(4): 341-371.

Ball, R., Foster, G., Nicholas, J. and Jensen, M.C. 1982. Corporate Financial Accounting: A Methodological Review of Empirical Research/Discussion/Reply. *Journal of Accounting Research* 20(Supplement): 161-234.

Baltagi, B.H. 1995. *Econometric Analysis of Panel Data.* Chichester, UK: John Wiley.

Bankruptcy Law. 1986. Beijing: Chinese Government.

Barney, J.B. 1990. The Debate Between Traditional Management Theory and Organizational Economics: Substantive Differences or Intergroup Conflict? *Academy of Management Review* 15(3): 382-393.

Barton, S.L., Hill, N.C. and Sundaram, S. 1989. An Empirical Test of Stakeholder Theory Predictions of Capital Structure. *Financial Management* 18(1): 36-44.

Beamish, P.W. 1993. The Characteristics of Joint Ventures in the People's Republic of China. *Journal of International Marketing* 1(2): 29-48.

Belsley, D.A., Kuh, E. and Welsch, R.E. 1980. *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity.* NY: John Wiley.

Berkman, H. and Bradbury, M.E. 1996. Empirical Evidence on the Corporate Use of Derivatives. *Financial Management* 25(2): 5-13.

Berndt, E.R. 1991. *The Practice of Econometrics: Classic and Contemporary.* NY: Addison Wesley Publishing Company.

Bessembinder, H. 1991. Forward Contracts and Firm Value: Investment Incentive and Contracting Effects. *Journal of Financial and Quantitative Analysis* 26(4): 519-532.

Bjuggren, P.O. 1995. A Transaction Cost Perspective on Financial Distress and Capital Structure. *International Review of Law and Economics* 15(4): 395-404.

Black, F. and Scholes, M. 1973. The Pricing of Options and Corporate Liabilities. *Journal of Political Economy* 81(3): 637-659.

Blair, R.D. and Karserman, D.L. 1983. *Law and Economics of Vertical Integration and Control.* NY: Academic Press.

Booth, P.M. and Stroinski, K.J. 1996. The Joint Development of Insurance and Investment Markets in Poland: An Analysis of Actuarial Risks. *British Actuarial Journal* 2(8): 741-763.

Borde, S.F., Chambliss, K. and Madura, J. 1994. Explaining Variation in Risk across Insurance Companies. *Journal of Financial Services Research* 8(3): 177-191.

Borland, J. and Garvey, G. 1994. Recent Developments in the Theory of the Firm. *Australian Economic Review* 105(1): 60-82.

Brennan, M.J. 1979. The Pricing of Contingent Claims in Discrete Time Models. *Journal of Finance* 34(1): 53-68.

Brennan, M.J. 1995. Corporate Finance Over the Past 25 Years. *Financial Management* 24(2): 9-22.

Brewer, E. 1995. The Impact of Deposit Insurance on S&L Shareholders' Risk/Return Trade-offs. *Journal of Financial Services Research* 9(1): 65-91.

Brown, M.J. and Hoyt, R.E. 2000. The Demand for Flood Insurance: Empirical Evidence. *Journal of Risk and Uncertainty* 20(3): 291-306.

Bryman, A. and Cramer, D. 1997. *Quantitative Data Analysis with SPSS for Windows*. NY: Routledge.

Bucheton, D. and Cominh, D. 1995. The Development of a Vietnamese Insurance Industry Organization, Operation and Prospects. *Geneva Papers on Risk and Insurance*: *Issues and Practice* 20(75): 180-186.

Caillaud, B., Dionne, G. and Jullien, B. 2000. Corporate Insurance with Optimal Financial Contracting. *Economic Theory* 16(1): 77-106.

Campbell, T.S. and Kracaw, W.A. 1987. Optimal Managerial Contracts and the Value of the Corporation. *Journal of Financial and Quantitative Analysis* 22(3): 315-328.

Campbell, T.S. and Kracaw, W.A. 1990. Corporate Risk Management and the Incentive Effects of Debt. *Journal of Finance* 45(5): 1673-1686.

Cao, Y.Z., Qian, Y.Y. and Weingast, B.R. 1999. From Federalism, Chinese Style to Privatization, Chinese Style. *Economics of Transition* 7(1): 103-131.

Chen, C.R., Steiner, T.L. and White, A.M. 1998. Risk Taking Behavior and Managerial Ownership in Depository Institution. *Journal of Financial Research* 21(1): 1-16.

Chen, C.R., Steiner, T.L. and White, A.M. 2001. Risk Taking Behavior and Managerial Ownership in the United States Life Insurance Industry. *Applied Financial Economics* 11(2): 165-171.

Chen, G.M., Firth, M. and Kim, J. 2000. The Post-Issue Market Performance of Initial Public Offerings in China's New Stock Markets. *Review of Quantitative Finance and Accounting* 14(4): 319-339.

Chen, Q. 1998. The Status Quo and Outlook of Chinese Insurance Market, in: State Information Center (eds.), *The Outlook of China's Economy in 1999 (in Chinese)* (pp. 286-291). Beijing: China Economic Publishing House.

Chen, X. and Jiang, D. 2000. Mixed Ownership, Firm Performance and Industry Competition. *Economic Research (Jingji Yanjiu in Chinese)* 8: 28-35.

Cheng, X.Y., Zheng, X.Z. and Huang, X.L. 2000. Ownership Structure and Firm Performance: An Empirical Studies on Publicly Listed Companies in the People's Republic of China. *Securities Markets (in Chinese)* 4: 34-41.

Cheung, G.W. and Chow, I.H. 1999. Subcultures in Greater China: A Comparison of Managerial Values in the People's Republic of China, Hong Kong, and Taiwan. *Asia Pacific Journal of Management* 16(3): 369-387.

Chi, F.L. 1999. Streamlining Corporate Governance in China's State Enterprises. *Transition* February: 17-18.

Chi, H.Y. and Ma, Y.H. 2000. Comparative Analysis on Various Models of Assets Reorganization. *Forecasts (Yuche in Chinese)* 2: 23-29.

Child, J. 1975. Managerial and Organizational Factors Associated with Company Performance, Part 2: A Contingency Analysis. *Journal of Management Studies* 12(1): 12-27.

Child, J. and Markoczy, L. 1993. Host-country Managerial Behavior and Learning in Chinese and Hungarian Joint Ventures. *Journal of Management Studies* 30(4): 611-631.

Chow, C.W. 1982. The Demand for External Auditing: Size, Debt and Ownership Influences. *Accounting Review* 57(2): 272-291.

Christie, A.A. and Richard, L. 1990. Aggregation of Test Statistics: An Evaluation of the Evidence on Contracting and Size Hypotheses; Statistics vs. Economics. *Journal of Accounting and Economics* 12(1-3): 15-44.

Chung, K.H. 1993. Asset Characteristics and Corporate Debt Policy: An Empirical Test. *Journal of Business Finance & Accounting* 20(1): 83-98.

Chung, K.H. and Charoenwong, C. 1991. Investment Options, Assets in Place, and the Risk of Stocks. *Financial Management* 20(3): 21-33.

Chung, K.H. and Pruitt, S.W. 1994. A Simple Approximation of Tobin's Q. *Financial Management* 23(3): 70-74.

Clauses, Premium Rates of Property Basic Risks Covers and Property Comprehensive Risks Covers. 1996. Beijing: People's Bank of China.

Coles, J.W. and Hesterly, W.S. 1998. The Impact of Firm-specific Assets and the Interaction of Uncertainty: An Examination of Make or Buy Decisions in Public and Private Hospitals. *Journal of Economic Behavior & Organization* 36(3): 383-409.

Colquitt, L.L and Hoyt, R.E. 1997. Determinants of Corporate Hedging Behavior: Evidence from the Life Insurance Industry. *Journal of Risk and Insurance* 64(4): 649-671.

Commercial Bank Law. 1995. Beijing: Chinese Government.

Companies Law. 1993. Beijing: Chinese Government.

Contents and Formats of Annual Report for Joint-stock Companies. 1997-99. Beijing: China Securities Regulatory Commission.

Cooke, T.E. and Wallace, R.S.O. 1990. Financial Disclosure Regulation and Its Environment: A Review and Further Analysis. *Journal of Accounting and Public Policy* 9(2): 79-110.

Copeland, T.E. and Weston J.F. 1992. *Financial Theory and Corporate Policy*. NY: Addison-Wesley Publishing Company.

Core, J.E. 1997. On the Corporate Demand for Directors' and Officers' Insurance. *Journal of Risk and Insurance* 64(1): 63-87.

Cornell, B. and Shapiro, A.C. 1987. Corporate Stakeholders and Corporate Finance. *Financial Management* 16(1): 5-14.

Cox, J.C., Ross, S.A. and Rubinstein, M. 1979. Option Pricing: A Simplified Approach. *Journal of Financial Economics* 7(3): 229-263.

CSRC database. 2000. Beijing: China Securities Regulatory Commission (CSRC).

Cummins, J.D. and Sommer, D.W. 1996. Capital and Risk in Property-Liability Insurance Markets. *Journal of Banking and Finance* 20(6): 1069-1092.

Cummins, J.D., Phillips, R.D. and Smith, S.D. 2001. Derivatives and Corporate Risk Management: Participation and Volume Decisions in the Insurance Industry. *Journal of Risk and Insurance* 68(1): 51-90.

Das, P. and Srinivasan, P.V. 1999. Demand for Telephone Usage in India. *Information Economics and Policy* 11(2): 177-194.

Das, T.K. and Teng, B.S. 2001. Strategic Risk Behavior and Its Temporalities: Between Risk Propensity and Decision Context. *Journal of Management Studies* 38(4): 515-534.

Darrough, M.N. and Stoughton, N.M. 1986. Moral Hazard and Adverse Selection: The Question of Financial Structure. *Journal of Finance* 41(2): 501-513.

Davidson, W.N., Cross, M.L. and Thornton, J.E. 1992. Corporate Demand for Insurance: Some Empirical and Theoretical Results. *Journal of Financial Services Research* 6(1): 61-71.

DeAngelo, H. and Masulis, R.W. 1980. Optimal Capital Structure Under Corporate and Personal Taxation. *Journal of Financial Economics* 8(1): 3-29.

DeFond, M.L., Wong, T.J. and Li, S.H. 2000. The Impact of Improved Independence on Audit Market Concentration in China. *Journal of Accounting and Economics* 28(3): 269-305.

Delery, J.E. and Doty, D.H. 1996. Modes of Theorizing in Strategic Human Resource Management: Tests of Universalistic, Contingency, and Configurational Performance Predictions. *Academy of Management Journal* 39(4): 802-835.

DeMarzo, P. and Duffie, D. 1995. Corporate Incentives for Hedging and Hedge Accounting. *Review of Financial Studies* 8(3): 743-772.

Demski, J.S. 1988. Positive Accounting Theory: A Review. *Accounting, Organizations and Society* 13(6): 623-629.

Dernberger, R.F. 1999. The People's Republic of China at 50: The Economy. *China Quarterly* 159(3): 607-615.

Dewar, R. and Werbel, J. 1979. Universalistic and Contingency Predictions of Employee Satisfaction and Conflict. *Administrative Science Quarterly* 23(3): 426-451.

Diamond, D.W. and Verrechia, R.E. 1991. Disclosure, Liquidity, and the Cost of Capital. *Journal of Finance* 46(3): 1325-1359.

Doherty, N.A. 1997. Financial Innovation in the Management of Catastrophic Risk. *Journal of Applied Corporate Finance* 10(3): 84-95.

Doherty, N.A. 2000a. Creating Value Through Managing Corporate Risk: Insurance, Financial Products and Financial Strategies. Wharton School *Working Paper*. University of Pennsylvania.

Doherty, N.A. 2000b. *Integrated Risk Management: Techniques and Strategies For Reducing Risk*. NY: McGraw-Hill.

Doherty, N.A. and Garven, J.R. 1996. Price Regulation in Property-Liability Insurance: A Contingent – Claims Approach. *Journal of Finance* 41(5): 1031-1050.

Doherty, N.A. and Smith, C.W. 1993. Corporate Insurance Strategy: The Case of British Petroleum. *Journal of Applied Corporate Finance* 6(1): 4-15.

Donaldson, L. 2001. *The Contingency Theory of Organizations*. Thousand Oaks, California: Sage Publications.

Donaldson, T. and Preston, L.E. 1995. The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *Academy of Management Review* 20(1): 65-91.

Downs, D.H. and Sommer, D.W. 1999. Monitoring, Ownership, and Risk-Taking: The Impact of Guaranty Funds. *Journal of Risk and Insurance* 66(3): 477-497.

Dye, R.A. 1985. Disclosure of Nonproprietary Information. *Journal of Accounting Research* 23(1); 123-145.

Eisenhardt, K.M. 1989. Agency Theory: An Assessment and Review. *Academy of Management Review* 14(1): 57-74.

Falush, P. 1996. Emerging Markets and Liberation in Insurance. *Insurance Trends* July: 1-4.

Fama, E.F. and Jensen, M.C. 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26(2): 301-325.

Fields, J.A. and Tirtiroglu, D. 1991. Agency-Theory Implications for the Insurance Industry: A Review of the Theoretical and Empirical Research. *Quarterly Journal of Business and Economics* 30(1): 40-61.

Fishman, M.J. and Hagerty, K.M. 1989. Disclosure Decisions by Firms and the Competition for Price Efficiency. *Journal of Finance* 44(3): 633-646.

Firth, M. 1979. The Impact of Size, Stock Market Listing, and Auditors on Voluntary Disclosure in Corporate Annual Reports. *Accounting and Business Research* 9(36): 273-280.

Fleisher, M.B. and Su, D.W. 1998. Risk, Return and Regulation in Chinese Stock Markets. *Journal of Economics and Business* 50(3): 239-256.

Frederickson, J.W. 1984. The Comprehensiveness of Strategic Decision Processes: Extensions, Observations, Future Directions. *Academy of Management Journal* 27(3): 445-466.

Freeman, R.E. 1984. *Strategic Management: A Stakeholder Approach.* Marshfield, MA: Pitman.

Froot, K.A., Scharfstein, D.S. and Stein, J.C. 1993. Risk Management: Coordinating Corporate Investment and Financing Policies. *Journal of Finance* 48(5): 1629-1658.

Furlong, F.T. and Keeley, M.C. 1989. Capital Regulation and Bank Risk-Taking: A Note. *Journal of Banking and Finance* 13(4): 883-891.

Gao, C.D. 1997. *Study on the Chinese Securities Markets (in Chinese).* Beijing: China Financial Publishing House.

Gao, S. and Yao, Y. 1999. Implementation of Socially Optimal Outcomes in the Liquidation of Publicly Listed Enterprises in China. *China Economic Review* 10(1): 41-58.

Gao, X.H. 2000. Ownership Efficiency and Market Efficiency: An Analysis of Chinese Publicly Listed Companies' Preference for Equity Financing. *Investment Studies (Touzi Yanjiu in Chinese)* 8: 22-26.

Garven, J.R. 1987. On the Application of Finance Theory to the Insurance Firm. *Journal of Financial Services Research* 1(1): 57-77.

Garven, J.R. 1996. Reinsurance, Taxes, and Efficiency: A Contingent Claims Model of Insurance Market Equilibrium. *Journal of Financial Intermediation* 5(1): 74-93.

Garven, J.R. and MacMinn, R.D. 1993. The Underinvestment Problem, Bond Covenants, and Insurance. *Journal of Risk and Insurance* 60(4): 635-646.

Gaver, J.J. and Gaver, K.M. 1993. Additional Evidence on the Association Between the Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies. *Journal of Accounting and Economics* 16(1-3): 125-160.

Gay, G.D. and Nam, J. 1998. The Underinvestment Problem and Corporate Derivatives Use. *Financial Management* 27(4): 53-69.

Ginzberg, M. 1980. An Organizational Contingencies View of Accounting and Information Systems Implementation. *Accounting, Organizations and Society* 5(6): 369-382.

Gordon, R.A. 1986. Issues in Multiple Regression. *American Journal of Sociology* 73(4): 592-619.

Graham, L.E. 1996. Setting a Research Agenda for Auditing Issues in the People's Republic of China. *International Journal of Accounting* 31(1): 19-37.

Grace, M.F. and Rebello, M.J. 1993. Financing and the Demand for Corporate Insurance. *Geneva Papers on Risk and Insurance Theory* 18(2): 147-172.

Greene, W.H. 1999. *Econometric Analysis*. Englewood Cliffs, NJ: Prentice-Hall.

Grillet, L. 1992a. Corporate Insurance and Corporate Stakeholders: I. Transaction Costs Theory. *Journal of Insurance Regulation* 11(2): 233- 251.

Grillet, L. 1992b. Organizational Capital and Corporate Insurance Hedging. *Journal of Risk and Insurance* 59(3): 462-469.

Grillet, L. 1993. Corporate Insurance and Corporate Stakeholders: Limits of Insurability and Public Policy. *Journal of Insurance Regulation* 11(3): 291-313.

Gul, F.A. 1999. Government Share Ownership, Investment Opportunity Set and Corporate Policy Choices in China. *Pacific-Basin Finance Journal* 7(2): 157-172.

Han, L.M. 1996. Managerial Compensation and Corporate Demand for Insurance. *Journal of Risk and Insurance* 63(3): 381-404.

Hardwick, P. and Adams, M. 1999. The Determinants of Financial Derivatives Use in the United Kingdom Life Insurance Industry. *Abacus* 35(2): 163-184.

Harris, M. and Raviv, A. 1990. Capital Structure and the Informational Role of Debt. *Journal of Finance* 45(2): 321-349.

Hart, O.D. 1995. *Firms, Contracts and Financial Structure*. Oxford: Oxford University Press.

Haushalter, G.D. 2000. Financing Policy, Basis Risk, and Corporate Hedging: Evidence from Oil and Gas Producers. *Journal of Finance* 55(1): 107-151.

Hausman, J.A. 1978. Specification Tests in Econometrics. *Econometrica* 46(6): 1251-1272.

He, S. 1998. Empirical Analysis on the Corporate Governance of Chinese Publicly Listed Companies. *Economic Research (in Chinese)* 5: 28-36.

Hill, C.W.L. and Jones, T.M. 1992. Stakeholder-Agency Theory. *Journal of Management Studies* 29(2): 131-154.

Holderness, C.G. 1990. Liability Insurers as Corporate Monitors. *International Review of Law and Economics* 10(2): 115-129.

Hopper, T. and Powell, A. 1985. Making Sense of Research into the Organizational and Social Aspects of Management Accounting: A Review of Its Underlying Assumptions. *Journal of Management Studies* 22(5): 429-465.

Hoyt, R.E. and Khang, H. 2000. On the Demand for Corporate Property Insurance. *Journal of Risk and Insurance* 67(1): 91-107.

Hsiao, C. 1985. Benefits and Limitations of Panel Data. *Econometric Reviews* 4(2): 121-174.

Hsieh, S., Chen, A.H. and Ferris, K.R. 1994. The Valuation of PBGC Insurance Premiums Using an Option Pricing Model. *Journal of Financial and Quantitative Analysis* 29(1): 89-99.

Huang, Y. and Duncan, R. 1997. How Successful Were China's State Sector Reforms? *Journal of Comparative Economics* 24(1): 65-78.

Hussain, A. and Zhuang, J. Z. 1997. Chinese State Enterprises and Their Reform. *Asia Pacific Business Review* 3(3): 20-37.

Insurance Law (1995), Beijing: Chinese Government.

International Finance Corporation (IFC). 1998. *Emerging Stock Markets Factbook* (1998). Washington, DC: International Finance Corporation.

Ireland, J.C. and Lennox, C.S. 2002. The Large Audit Firm Fee Premium: A Case of Selectivity Bias. *Journal of Accounting, Auditing and Finance* 17(1): 73-91.

Jaccard, J., Turrisi, R. and Wan, C.K. 1990. Interaction Effects in Multiple Regression. *Sage University Paper Series on Quantitative Applications in the Social Sciences*: 07-069, Newbury Park, CA: Sage Publications.

Jefferson, G.H. 1998. China's State Enterprises: Public Goods, Externalities, and Coarse. *American Economic Review* 88(2): 428-432.

Jensen, M.C. 1983. Organization Theory and Methodology. *Accounting Review* 58(2): 319-339.

Jensen, M.C. 1986. Agency Costs of Free Cash Flow, Corporate Finance and Takeovers. *American Economic Review* 76(2): 323-329.

Jensen, M.C. and Meckling, W.H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3(3): 305-360.

Jick, T.D. 1979. Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly* 24(4): 602-611.

Judge, G.G., Hill, R.C., Griffiths, W.E., Lutkepohl, H. and Lee, T. 1982. *Introduction to the Theory and Practice of Econometrics*. NY: John Wiley.

Kane, G.D. and Meade, N.L. 1998. Ratio Analysis Using Rank Transformation. *Review of Quantitative Finance and Accounting* 10(1): 59-74.

Kaplan, R.S. 1983. Comments on Wilson and Jensen. *Accounting Review* 58(2): 340-346.

Karmel, S.M. 1996. Securities Markets and China's International Economic Integration. *Journal of International Affairs* 49(2): 525-556.

Kay, N.M. 1992. Markets, False Hierarchies and the Evolution of the Modern Corporation. *Journal of Economic Behaviour and Organization* 17(3): 315-333.

Keita, L.D. 1997. Neoclassical Economics and the Last Dogma of Positivism: Is the Normative-Positive Distinction Justified? *Metaphilosophy* 28(1-2): 81-101.

Kennedy, P. 1998. *A Guide to Econometrics*. Oxford: Blackwell.

Kidwell, D.S., Sorensen, E.H. and Wachowicz, J.M. 1987. Estimating the Signalling Benefits of Debt Insurance: The Case of Municipal Bonds. *Journal of Financial and Quantitative Analysis* 22(3): 399-313.

Knopf, J.D. and Teall, J.L. 1996. Risk-Taking Behavior in the U.S. Thrift Industry: Ownership Structure and Regulatory Changes. *Journal of Banking and Finance* 20(8): 1329-1350.

Kynge, J. 2000. Foreigners Have High Hopes. *Financial Times*: 13 November 2000, p.5.

Lang, L., Ofek, E. and Stulz, R.M. 1996. Leverage, Investment, and Firm Growth. *Journal of Financial Economics* 40(1): 3-29.

Lee, C.F. and Rui, O.M. 2000. Does Trading Volume Contain Information to Predict Stock Return? Evidence from China's Stock Markets. *Review of Quantitative Finance and Accounting* 14(4): 341-360.

Leftwich, R.H. 1979. *The Price System and Resource Allocation*. Hinsdale, Illinois: The Dryden Press.

Leung, M.K. and Young, T. 2002. China's Entry to the WTO: Managerial Implications for Foreign Banks. *Managerial and Decision Economics* 23(1): 1-8.

Levy, H. and Lazarovich-Porat, E. 1995. Signalling Theory and Risk Perception: An Experimental Study. *Journal of Economics and Business* 47(1): 39-56.

Li, D.M. and Deng, S.Q. 1999. An Investigation into the Structure of the Board of Directors in Chinese Publicly Listed Companies. *Journal of Securities Markets (in Chinese)* 12: 34-39.

Li, Y.J. 1999. The Impact of SOE Restructuring on the Corporate Demand for Property Insurance. *Insurance Research (Baoxian Yanjiu in Chinese)* 1: 35-38.

Li, Z.Q. 2000. Incentive Schemes and Firm Performance: An Empirical Analysis of Publicly Listed Companies. *Accounting Research (in Chinese)* 1: 24-30.

Lin, Z.J. and Chen, F. 1999. Applicability of the Conservatism Accounting Convention in China: Empirical Evidence. *International Journal of Accounting* 34(4): 517-537.

Lintner, J. 1965. The Valuation of Risky Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics* 47(1): 13-17.

Lipsey, R.G. 1989. *An Introduction to Positive Economics.* London: Weidenfeld and Nicolson.

Long, D.M., Payne, J.D. and Feng, C.Y. 1999. Information Transmission in the Shanghai Equity Market. *Journal of Financial Research* 22(1): 29-45.

Luo, Y.D. 1999. Time-based Experience and International Expansion: The Case of An Emerging Economy. *Journal of Management Studies* 36(4): 504-533.

Luo, Y.D. and Sadrieh, F. 1995. The Relationship Between Business Strategy Variables and Joint Venture Performance: Lesson from China. *Journal of Business Management* 3(2): 114-137.

Ma, Y.S. 1998. The Chinese Route to Privatization - The Evolution of the Shareholding System Option. *Asian Survey* 38(4): 379-397.

Ma, Y.W., Lin, Z.J., and Ma, M.Z. 1998. *Encyclopedia of Insurance Business (in Chinese).* Beijing: China Financial Publishing House.

MacMinn, R.D. 1987. Insurance and Corporate Risk Management. *Journal of Risk and Insurance* 54(4): 658-677.

MacMinn, R.D. and Han, L.M. 1990. Limited Liability, Corporate Value, and the Demand for Liability Insurance. *Journal of Risk and Insurance* 57(4): 581-607.

Maddala, G.S.1992. *Introduction to Econometrics.* NJ: Prentice Hall.

Main, B.G.M. 1982a. The Firm's Insurance Decision: Some Questions Raised by the Capital Asset Pricing Model. *Managerial and Decision Economics* 3(1): 7-15.

Main, B.G.M. 1982b. Business Insurance and Large, Widely-held Corporations. *Geneva Papers on Risk and Insurance: Issues and Practices* 7(24): 237-247.

Main, B.G.M. 1983. Corporate Insurance Purchases and Taxes. *Journal of Risk and Insurance* 50(2): 197-223.

Main, B.G.M. 2000. Large Companies and Insurance Purchases: Some Survey Evidence. *Geneva Papers on Risk and Insurance: Issues and Practices* 25(2): 235-250.

May, D.O. 1995. Do Managerial Motives Influence Firm Risk Reduction Strategies? *Journal of Finance* 50(4): 1291-1308.

Mayer, C. 1994. Stock-Markets, Financial Institutions and Corporate Performance, in: Dimsdale, N. and Prevezer, M. (eds.), *Capital Markets and Corporate Governance* (pp. 179-194). Oxford: Clarendon Press.

Mayers, D. and Smith, C.W. 1981. Contractual Provisions, Organizational Structure, and Conflict Control in Insurance Markets. *Journal of Business* 54(3): 407-434.

Mayers, D. and Smith, C.W. 1982. On the Corporate Demand for Insurance. *Journal of Business* 55(2): 281-296.

Mayers, D. and Smith, C.W. 1986. The Corporate Insurance Decision, in: Stern, J. M. and Chew, D.H. (eds.), *The Revolution in Corporate Finance* (pp. 230-238). NY: Blackwell Publishing.

Mayers, D. and Smith, C.W. 1987. Corporate Insurance and the Underinvestment Problem. *Journal of Risk and Insurance* 54(1): 45-54.

Mayers, D. and Smith, C.W. 1990. On the Corporate Demand for Insurance: Evidence from the Reinsurance Market. *Journal of Business* 63(1): 19-40.

McGregor, R. 2000. Debt-laden Institutions Lighten Their Road. *Financial Times*: 13 November 2000, p.3.

Merton, R. 1993. Operation and Regulation in Financial Intermediation: A Functional Perspective, in Englund, P. (ed.), *Operation and Regulation of Financial Markets* (pp. 175-199). Stockholm: Ekonomiska Radet.

Mian, S.L. 1996. Evidence on Corporate Hedging Policy. *Journal of Financial and Quantitative Analysis* 31(3): 419-439.

Miller, M.H. and Rock, K. 1985. Dividend Policy Under Asymmetric Information. *Journal of Finance* 40(4): 1031-1051.

Mills, R.W. and Cao, Y.Q. 1996. Accounting and Financial Reporting in China. *Management Accounting* January: 26-28.

Mok, H.M.K. and Hui, Y.V. 1998. Underpricing and Aftermarket Performance of IPOs in Shanghai, China. *Pacific-Basin Finance Journal* 6(5): 453-474.

Moser, C.A. 1968. *Survey Methods in Social Investigation*. London: Heinemann.

Mossin, J. 1966. Equilibrium in a Capital Asset Market. *Econometrica* 34(4): 768-783.

Mossin, J. 1968. Aspects of Rational Insurance Purchasing. *Journal of Political Economy* 76(4): 553-568.

Myers, S. 1977. Determinants of Corporate Borrowing. *Journal of Financial Economics* 5(1): 147-175.

Myers, S. 1984. The Capital Structure Puzzle. *Journal of Finance* 39(3): 575-592.

Myers, S. and Majluf, N. 1984. Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics* 13(2): 187-221.

Nair, R.D. and Frank, W.G. 1980. The Impact of Disclosure and Measurement Practices on International Accounting Classifications. *Accounting Review* 5(3): 426-450.

Nance, D.R., Smith, C.W. and Smithson, C.W. 1993. On the Determinants of Corporate Hedging. *Journal of Finance* 48(1): 267-284.

Naser, K. and Wallace, R.S.O. 1995. Firm-Specific Determinants of the Comprehensiveness of Mandatory Disclosure in the Corporate Annual Reports of Firms Listed on the Stock Exchange of Hong Kong. *Journal of Accounting and Public Policy* 14(4): 311-368.

Nationwide Insurance Clauses and Premium Rates. 1993. Beijing: People's Bank of China.

Nilakant, V. and Rao, H. 1994. Agency Theory and Uncertainty in Organizations: An Evaluation. *Organization Studies* 15(5): 649-672.

Niu, Y. 1995. The Chinese Insurance Market: Challenge and Opportunity. *Insurance Trends* January: 5-7.

Organization for Economic Cooperation and Development (OECD). 2000. *Reforming China's Enterprises*. Paris: OECD.

Parry, M.E. and Parry, A.E. 1991. The Purchase of Insurance by a Risk-neutral Firm for a Risk-averse Agent. *Journal of Risk and Insurance* 58(1): 30-46.

Patton, M.Q. 1990. *Qualitative Evaluation and Research Methods*. London: Sage Publications.

Paul, J.M. 1992. On the Efficiency of Stock-based Compensation. *Review of Financial Studies* 5(3): 471-502.

Peng, W.D. 1999. On the Choice of Corporate Financing: An Empirical Analysis of Publicly Listed Companies in China. *Investment Studies (in Chinese)* 5: 34-36.

People's Bank of China (PBOC). 1998. *China Financial Yearbook 1997*. Beijing: China Financial Publishing House.

People's Bank of China (PBOC). 1999. *China Financial Yearbook 1998*. Beijing: China Financial Publishing House.

People's Bank of China (PBOC). 2000. *China Financial Yearbook 1999*. Beijing: China Financial Publishing House.

People's Daily (Newspaper). 2nd August 1999, p.2 (in Chinese).

Perotti, E.C. and Sun, L.X. and Zou, L. 1999. State-owned Enterprises versus Township and Village Enterprises in China. *Comparative Economic Studies* 41(2-3): 151-179.

Pilotte, E. 1992. Growth Opportunities and the Stock Price Response to New Financing. *Journal of Business* 65(3): 371-394.

Poon, W.P.H., Firth, M. and Fung, H.G. 1998. Asset Pricing in Segmented Securities Markets: Preliminary Evidence from China-domiciled Companies. *Pacific-Basin Finance Journal* 6(3-4): 307-319.

Pottier, S.W. and Sommer, D.W. 1997. Agency Theory and Life Insurer Ownership Structure. *Journal of Risk and Insurance* 64(3): 529-543.

Provisional Ordinance on the Issue and Trade of Shares. 1993. Beijing: China Securities Regulatory Commission.

Provisional Ordinance on Insurance Administration. 1996. Beijing: People's Bank of China.

Puelz, R. 1992. The Effectiveness of Debt Insurance as a Valid Signal of Bond Quality: Comment. *Journal of Risk and Insurance* 59(3): 499-507.

Qi, D., Wu, W. and Zhang, H. 2000. Shareholding Structure and Corporate Performance of Partially Privatized Firms: Evidence from Listed Chinese Companies. *Pacific-Basin Finance Journal* 8(5): 587-610.

Qian, Y.Y., Roland, G. and Xu, C.G. 1999. Why is China Different from Eastern Europe? Perspectives from Organization Theory. *European Economic Review* 43(4-6): 1085-1094.

Ragan, J.F., Warren, J.T. and Bratsberg, B. 1999. How Similar Are Pay Structures in 'Similar' Departments of Economics? *Economics of Education Review* 18(3): 347-360.

Rebello, M.J. 1995. Adverse Selection Costs and the Firm's Financing and Insurance Decesions. *Journal of Financial Intermediation* 4(1): 21-47.

Rejda, G.E. 1998. *Principles of Risk Management and Insurance*. NY: Addison-Wesley Educational Publishers.

Roberts, R.W. 1992. Determinants of Corporate Social Responsibility Disclosure: An Application of Stakeholder Theory. *Accounting, Organizations and Society* 17(6): 595-612.

Ross, S.A. 1977. The Determination of Financial Structure: The Incentive Signalling Approach. *Bell Journal of Economics* 8(1): 23-40.

Ross, S.A. 1987. The Interrelations of Finance and Economics: Theoretical Perspectives. *American Economic Review* 77(2): 29-34.

Roy, A., Walters, P.G.P. and Luk, S.T.K. 2001. Chinese Puzzles and Paradoxes, Conducting Business Research in China. *Journal of Business Research* 52(2): 203-210.

Rubinstein, M. 1974. An Aggregation Theorem for Securities Markets. *Journal of Financial Economics* 1(2): 225-244.

Sarantakos, S. 1993. *Social Research.* Melbourne: Macmillan Education.

Saunders, A., Strock, F. and Travlos, N. 1990. Ownership Structure, Deregulation, and Bank Risk Taking. *Journal of Finance* 45 (2): 643-654.

Schlesinger, H. 1981. The Optimal Level of Deductibility in Insurance Contracts. *Journal of Risk and Insurance* 48(3): 465-481.

Schnabel, J.A. and Roumi, E. 1989. Corporate Insurance and the Underinvestment Problem: An Extension. *Journal of Risk and Insurance* 56(1): 155-159.

Schoonhoven, C.B. 1981. Problems with Contingency Theory: Testing Assumptions Hidden within the Language of Contingency Theory. *Administrative Science Quarterly* 26(3): 349-377.

Scordis, N.A. and Porat, M.M. 1998. Captive Insurance Companies and Manager-Owner Conflicts. *Journal of Risk and Insurance* 65(2): 289-302.

Securities Law. 1998. Beijing: Chinese Government.

Shapiro, A.C. and Titman, S. 1986. An Integrated Approach to Corporate Risk Management, in: Stern, J.M. and Chew, D.H. (eds.), *The Revolution in Corporate Finance* (pp. 215-229). NY: Blackwell Publishing.

Sharpe, W.F. 1964. Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk. *Journal of Finance* 19(4): 425-442.

Shelanski, H.A. and Klein, P.G. 1995. Empirical Research in Transaction Cost Economics: A Review and Assessment. *Journal of Law, Economics and Organization* 11(2): 335-361.

Shen, L. 2000. China's Insurance Market: Opportunity, Competition and Market Trends. *Geneva Papers on Risk and Insurance: Issues and Practices* 25(3): 335-355.

Shenkar, O. and Von Glinow, M.A. 1994. Paradoxes of Organizational Theory and Research: Using the Case of China to Illustrate National Contingency. *Management Science* 40(1): 56-71.

Shi, J.X. and Su, W.H. 2000. Competitive Strategies: A Survey on the Property Insurance Markets in China. *Shanghai Insurance (in Chinese)* 24(1): 31-33.

Shleifer, A. and Vishny, R. 1986. Large Shareholders and Corporate Control. *Journal of Political Economy* 94(3): 461-488.

Skinner, D.J. 1994. Why Firms Voluntarily Disclose Bad News. *Journal of Accounting Research* 32(1): 38-60.

Skogh, G. 1989. The Transactions Cost Theory of Insurance: Consulting Impediments and Costs. *Journal of Risk and Insurance* 56(4): 726-732.

Skogh, G. 1991. Insurance and the Institutional Economics of Financial Intermediation. *Geneva Papers on Risk and Insurance: Issues and Practice* 16(58): 59-72.

Smith, C.W. 1986. On the Convergence of Insurance and Finance Research. *Journal of Risk and Insurance* 53(4): 693-717.

Smith, C.W. and Stulz, R. 1985. The Determinants of Firm's Hedging Policies. *Journal of Financial and Quantitative Analysis* 20(4): 391-405.

Smith, C.W. and Watts, R. 1992. The Investment Opportunity Set and Corporate Financing, Dividend and Compensation Policies. *Journal of Financial Economics* 32(3), 263-292.

Smyth, R. 1999. Labor-Market and Social-Welfare Reform in the State-owned Sector in China. *Journal of Developing Areas* 33(2): 223-244.

Snow, C.C. and Thomas, J.B. 1994. Field Research Methods in Strategic Management: Contributions to Theory Building and Testing. *Journal of Management Studies* 31(4): 457-480.

Solon, G.S. 1989. The Value of Panel Data in Economic Research, in: Kasprzyk, D., Duncan, G.J., Kalton, G. and Singh, M.P. (eds.), *Panel Surveys* (pp. 486-496). NY: John Wiley.

Speklé, R.F. 2001. Explaining Management Control Structure Variety: A Transaction Cost Economics Perspective. *Accounting, Organization and Society* 26(4-5): 419-441.

Staking, K.B. and Babbel, D.F. 1995. The Relation Between Capital Structure, Interest Rate Sensitivity, and Market Value in the Property-Liability Insurance Industry. *Journal of Risk and Insurance* 62(4): 690-718.

Stulz, R. 1990. Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics* 26(1): 3-27.

Sun, H., Hone, P. and Doucouliagos, H. 1999. Economic Openness and Technical Efficiency: A Case Study of Chinese Manufacturing Industries. *Economics of Transition* 7(3): 615-636.

Sun, Q. and Tong, W.H.S. 2000. The Effect of Market Segmentation on Stock Prices: The China Syndrome. *Journal of Banking and Finance* 24(12): 1875-1902.

Sun, Q., Tong, W.H.S. and Tong, J. 2002. How Does Government Ownership Affect Firm Performance? Evidence from China's Privatization Experience. *Journal of Business, Finance & Accounting* 29(1-2): 1-28.

Sun, Q., Tong, W.H.S. and Yu, Q. 2002. Determinants of Foreign Direct Investment Across China. *Journal of International Money and Finance* 21(1): 79-113.

Sung, J. 1997. Corporate Insurance and Managerial Incentives. *Journal of Economic Theory* 74(2): 297-332.

Szpiro, G.G. 1985. Optimal Insurance Coverage. *Journal of Risk and Insurance* 52(4): 704-710.

Talmor, E. 1981. Asymmetric Information, Signalling, and Optimal Corporate Financial Decisions. *Journal of Financial and Quantitative Analysis* 16(4): 413-435.

Tam, O.K. 2000. Models of Corporate Governance for Chinese Companies. *Corporate Governance - An International Review* 8(1): 53-65.

Tan, J.J. and Litschert, R.J. 1994. Environment-Strategy Relationship and Its Performance Implications: An Empirical Study of Chinese Electronics Industry. *Strategic Management Journal* 15(1): 1-20.

Teoh, S.H. and Hwang, C.Y. 1991. Nondisclosure and Adverse Disclosure as Signals of Firm Value. *Review of Financial Studies* 4(2): 283-313.

Thakor, A.V. 1982. An Exploration of Competitive Signalling Equilibria with 'Third Party' Information Production: The Case of Debt Insurance. *Journal of Finance* 37(3): 717-739.

Tian, G.H. 2001. State Shareholding and the Value of China's Firms. London Business School *Working Paper* (February), London Business School, UK.

Tihanyi, L.T. and Ellstrand, A.E. 1998. The Involvement of Board of Directors and Institutional Investors in Investing in Transition Economies: An Agency Theory Approach. *Journal of International Management* 4(4): 337-351.

Tinker, T.A.M., Merino, B.D. and Neimark, M.D. 1982. The Normative Origins of Positive Theories: Ideology and Accounting Thought. *Accounting, Organizations and Society* 7(2): 167-200.

Titman, S. and Wessels, R. 1988. The Determinants of Capital Structure Choice. *Journal of Finance* 43(1): 1-40.

Tufano, P. 1996. Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry. *Journal of Finance* 51(4): 1097-1137.

Tufano, P. 1998. Agency Costs of Corporate Risk Management. *Financial Management* 27(1): 67-77.

Van de Ven, A.H. and Drazin, R. 1985. The Concept of Fit in Contingency Theory, in: Staw, B.M. and Cummings, L.L. (eds.), *Research in Organizational Behavior* Vol.7 (pp. 333-365). Greenwich, CT: JAI.

Verrechia, R.E. 1983. Discretionary Disclosure. *Journal of Accounting and Economics* 5(2): 179-194.

Vickers, J. and G. Yarrow, 1998, *Privatization: An Economic Analysis*, Cambridge MA: MIT Press.

Von Neumann, J. and Morgenstern, O. 1947. *Theory of Games and Economic Behavior*. Princeton, NJ: Princeton University Press.

Walton, G. 1991. *Understanding Economics Today*. Homewood, Illinois: Irwin Publishers.

Wang, F. 1999. Income Tax Burden of Chinese Publicly Listed Companies. *Economic Research (in Chinese)* 5: 49-54.

Wang, Y. 2000. More Insurance Flexibility Needed. *China Daily (English)*: 8 September 2000, p.5.

Warner, J.B. 1977. Bankruptcy Costs: Some Evidence. *Journal of Finance* 32(2): 337-347.

Waterhouse, J.H. and Tiessen, P. 1978. A Contingency Framework for Management Accounting Systems' Research. *Accounting, Organizations and Society* 3(1): 65-76.

Watts, R.L. and Zimmerman, J.L. 1990. Positive Accounting Theory: A Ten Year Perspective. *Accounting Review* 65(1): 131-156.

Wei, G. 2000. Management Compensations and Company Performance: An Analysis of Chinese Publicly Listed Companies. *Economic Research (in Chinese)* 3: 32-39.

Wei, H.L., Yu, Z.Y., and Guo, Y. 1999. *The Opening Up and the Regulation of China's Insurance Market (in Chinese)*. Beijing: China Financial Publishing House.

White, H. 1980. A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity. *Econometrica* 48(4): 817-838.

Whited, T. 1992. Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data. *Journal of Finance* 47(4): 1425-1461.

Whitley, R. 1992. *Business Systems in East Asia*. London: Sage Publications.

Willhelm, K. 1999. Trimming the State Sector; Big Bang Chinese Style. *Transition* February: 18-19.

Williamson, O.E. 1985. *The Economic Institutions of Capitalism*. NY: Free Press.

Williamson, O.E. 1988. Corporate Finance and Corporate Governance. *Journal of Finance* 43(3): 567-591.

Williamson, O.E. 1990. The Firm as Nexus of Treaties: An Introduction, in: Aoki, M., Gustafsson, B. and Williamson, O.E. (eds.), *The Firm as a Nexus of Treaties* (pp. 6-25). London: Sage Publications.

Winkle, G.M., Huss, H.F., Chen, X.Z. 1994. Accounting Standards in the People's Republic of China: Responding to Economic Reforms. *Accounting Horizons* 8(3): 48-57.

Wong, J. 1988. Agency Theory and Accounting Choices: A Theoretical Framework. *Pacific Accounting Review* 1(1): 22-41.

Woodward, J. 1965. *Industrial Organization: Theory and Practice*. Oxford: Oxford University Press.

Wruck, K.H. 1990. Financial Distress, Reorganization, and Organizational Efficiency. *Journal of Financial Economics* 27(2): 419-444.

Wu, G.S. 2000. Insider Control and Corporate Governance Structure. *China Economic Issues (in Chinese)* 3: 36-42.

Wu, L.J. 2000. Insider Control, External Monitoring and the Performance of State-owned Enterprises. *Modern Economics Science (in Chinese)* 22(3): 60-66.

Wu, S.K., Bai, J. and Xi, Y.M. 1999. CEO Duality or Not: Evidence from Chinese Publicly Listed Companies. *Economic Research (in Chinese)* 8: 21-28.

Wu, X.H. 1996. A Sense of Immaturity. *Reactions* 16(9): 48-52.

Xiao, Z. 1999. Corporate Disclosures Made by Chinese Listed Companies. *International Journal of Accounting* 34(3): 349-373.

Xu, C.K. 2000. The Microstructure of the Chinese Stock Market. *China Economic Review* 11(1): 79-97.

Xu, N. 2000. A Review of Chinese Insurance Market in 1999. *Shanghai Insurance (in Chinese)* 24(1): 16-18.

Xu, X.N. and Wang, Y. 1999. Ownership Structure and Corporate Governance in Chinese Stock Companies. *China Economic Review* 10(1): 75-98.

Yao, S.J. and Song, H.Y. 1998. Introduction to Special Issue on Chinese Economic Development. *Economics of Planning* 31(2-3): 91-93.

Yamori, N. 1999. An Empirical Investigation of the Japanese Corporate Demand for Insurance. *Journal of Risk and Insurance* 66(2): 239-252.

Yuan, G.L. and Wang, H.F. 1999. Managerial Ownership and Incentives in Chinese Publicly Listed Companies. *Journal of Securities Markets (in Chinese)* 10: 37-42.

Zavoina, R. and McElvey, W. 1975. A Statistical Model for the Analysis of Ordinal Level Dependent Variables. *Journal of Mathematical Sociology* (summer): 103-120.

Zhang, G. 1998. Ownership Concentration, Risk Aversion and the Effect of Financial Structure on Investment Decisions. *European Economic Review* 42(12): 1751-1778.

APPENDIX

Annual Premiums Paid by Chinese Publicly Listed Companies 1997-99

Telephone-based Survey Instrument

Case No: _____

A. Basic Details

Company: .....

Location: ..... Phone: ..... Email: .....

Name and Position of interviewee: .....

Date Contacted: .....

B. Premium Data

1. Has your company ever purchased *non-compulsory property insurance* with a commercial insurer during the accounting periods 1997-99? (If your company has consolidated subsidiaries, their insurance purchases should be counted)

Year	Yes	No	Refused	Notes
1999				
1998				
1997				

2. (a) What was the total amount of *non-compulsory property insurance premiums accrued as expenses* in the accounting year 1999? (If your company prepares consolidated financial statements, please give the consolidated figure)

   (b) What was the equivalent figure in the 1998 and 1997 accounting years (If absolute premium figures are not easily accessible for 1998 and 1997, please give the approximate year-on-year percentage change)?

	1999 (RMB)	1998 (RMB or ±%)	1997 (RMB or ±%)	Refused
Total property Insurance premium				

Date carried out: July-September 2000

Zou, Hong, University of Wales, Swansea, UK.