

股权结构与公司经营风险*

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摘要

本文借鉴集体决策理论和代理理论,考察中国上市公司控股股东性质和股权集中度与经营风险之间的关系。我们发现,(1)非国有产权控股的上市公司的经营风险明显地高于国有产权控股的上市公司,这与非国有产权控股的上市公司经理人员的决策权力更大、经理人员的堑壕效应程度更小、以及这些公司面临的经营环境不确定性程度更高有关。(2)股权集中度和经营风险之间存在着非线性的U型关系,即股权更加集中或者更加分散都有可能导致更高的经营风险,而相对集中的股权制衡结构所导致的经营风险较小,进一步地,这种现象仅在国有控股的上市公司中存在。(3)此外,公司规模和多元化程度与经营风险之间存在着显著的负相关关系,而负债率则与经营风险之间存在着显著的正相关关系。

关键词:控股股东性质、股权集中度、经营风险、集体决策理论、代理理论

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一、引言

国内外已有大量文献考察公司治理与企业绩效之间的作用关系，这方面的研究已经相对成熟。其中与中国上市公司的股权结构相关的就包括陈晓和江东(2000)、陈小悦和徐晓东(2001)、于东智(2001)、杜莹和刘立国(2002)、陈信元、陈冬华、朱凯(2004)、夏立军和方轶强(2005)、徐莉萍、辛宇、陈工孟(2006a, 2006b)等。这些研究主要集中在控股股东性质、股权集中度和股权制衡等对企业经营绩效或市场价值的影响方面。

然而，公司绩效实际上可以从两个维度来衡量：一个维度是绩效水平，也是上述文献研究的重点；另一个维度是绩效波动，即绩效在一定时期内的变化程度。绩效波动可以说是公司风险的最终表现形式，而上述研究却少有涉及绩效波动。显然，了解公司治理对经营风险的影响具有重要的理论和现实意义：²

一方面，这类研究可以使我们对公司治理的作用效果和决策过程有更深刻的认识。之前关于公司治理与绩效表现之间的研究还远远未能达成一致，即使研究表明整体的公司治理质量与绩效表现之间呈正相关关系(例如，Gompers, Ishii, and Metrick, 2003)，但这仍然会存在问题，即为什么价值降低型(value-decreasing)或绩效减少型(performance-reducing)的治理机制在现实中仍然存在呢？例如：由于代理问题和合作/沟通问题的存在，之前的经验研究多数都发现董事会规模与公司绩效之间存在负相关关系，即董事会规模越大，公司绩效越差(Yermack, 1996; Eisenberg, Sundgren, and Wells, 1998)；但是，Cheng(2008)的研究表明，规模较大的董事会所存在的合作/沟通问题虽然会延缓决策过程，但在形成最终决策的过程中，它也会产生更多的讨价还价和折衷决定，这避免了小规模董事会在进行决策时所可能产生的极端性，即大规模董事会所做的决策不会特别好，但也不会特别坏，可见，规模较大的董事会更有可能降低公司的经营风险；此时，在对规模较大的董事会进行评价的时候，即要考虑到它对公司绩效的影响，也要考虑到它对经营风险的影响；规模较大的董事会所导致的较低经营风险和较低绩效之间有可能会存在着类似风险和收益这样的权衡关系。否则，我们就无法解释，既然规模较大的董事会是一种价值减少型的，那么它为什么仍然会在实务中得以存在呢？

另一方面，这样的研究往往与风险管理有着密切联系。随着人们对全球金融危机的认识日益深刻，风险管理正越来越多地被企业、投资者、监管机构、评级机构、股票交易所、机构投资者以及其他利益相关者所关注，而考察经营风险的影响因素可以为他们提供一些有价值的政策参考依据。此时，如何确定一个合适的经营风险水平以及判断相应的异常风险水平就成为一个关键的问题。原因在于，企业的正常生产经营以及价值创造，既要有一定的、合理的风险承担(risk-taking)，但又不能承担过度风险，因为这样极易导致企业的经营失败。

² 同绩效水平一样，绩效波动也是一个综合性的业绩指标，它是公司各种风险的最终实现形式。这些可能的风险包括经营风险、财务风险、市场风险、以及政策风险等。财务管理教材中“风险分析”部分通常区分“经营风险”和“财务风险”，二者构成“总体风险”。本文简便起见将绩效波动也称为“公司风险”，其涵盖的范围类似于财务管理教材中的“总体风险”，文章研究的因变量也是“总体风险”的概念。但是，由于我们在实证分析中单独控制了财务杠杆的影响，因此所检验的股权结构与公司风险的关系主要验证的是经营风险，所以在理论分析时往往又侧重于“经营风险”。

因此，最近一段时期，关于公司治理与经营风险之间关系的研究成为国际上公司财务学领域的学术前沿之一。³本文结合了中国转轨时期的特殊公司治理安排来拓展这方面的研究。具体来说，中国转轨时期最为重要的特殊公司治理安排主要体现在两个方面，一是控股股东性质，国有产权控股的上市公司与非国有产权控股的上市公司之间在所有权行使方式方面存在着非常明显的差异；二是股权的高度集中。这两种特殊的公司治理安排必然会对经营风险产生独特影响。因此，对这一问题的深入研究有助于我们更全面、更准确地把握股权性质和股权集中度在中国资本市场上的经济后果，印证不同性质和不同股权结构的上市公司的行为模式及其风险特征。通过考察股权性质和股权集中度与经营风险之间的关系，我们发现：

首先，国有产权控股上市公司的经营风险要明显地低于非国有产权控股的上市公司，这可能与国有产权控股的上市公司经理人员的决策权力更小、经理人员的堑壕效应程度更大以及这些公司面临的经营环境不确定性程度更低有关。

其次，股权集中度与经营风险之间存在着非线性的U型关系，而且这种关系主要是在国有控股的上市公司中存在，这可能与国有控股上市公司中股权集中度过高时政府的决策效应更加明显，而股权集中度过低时CEO的决策效应更加明显有关。

最后，我们还发现，负债率对经营风险存在着显著的正向影响，而规模和多元化程度都与经营风险之间存在着显著的负相关关系。

同时，与之前徐莉萍、辛宇、陈工孟(2006a、2006b)的研究相类似，我们发现股权性质对经营绩效的影响并不明显，而股权集中度与经营绩效之间存在着显著的正相关关系，而且这种正相关关系在非国有控股的上市公司中表现得更加明显。

接下来，我们将在第二部分对相关文献进行回顾和评述，第三部分提出研究假设，第四部分给出研究设计并报告实证结果，第五部分考察内生性并进行可靠性检验，最后得出本文的研究结论。

二、文献回顾和评述

近年来，国外开始有文献直接或间接考察公司治理与风险之间的关系。如：Clayton, Hartzell, and Rosenberg (2003)发现，CEO变更之后，股价波动会增加；而就波动增加的程度来说，强迫变更的要高于自愿变更的，因为强迫离职往往意味着公司在经营战略上很有可能会发生重大改变；在自愿离职中，外部继任所导致的波动增加要高于内部继任的，原因在于外部继任所导致的公司在经营上的不确定性会更高。

比较正式的关于公司治理与风险的研究始自Adams, Almeida, and Ferreira (2005)，他们发现，CEO权力越大(小)，企业的绩效波动也越大(小)，其原因在于：当CEO的权力相对较小时(无论是相对于其他经理人员还是相对于董事会)，其所做出的各项决策就必须得到其他经理人员或董事会的同意或批准，这会产生类似于集体决策的效果，从而使绩效波动降低；而如果CEO的决策权力较大，那么由于其判断错误而产生的风险就不容易分散，此时，导致特别好和特别差的极端决策的可能性都会更高。随后，Cheng (2008)发现，董事会规模越大(小)、公司绩效波动越小(大)，其原因在于：规模更大的董事会更有可能通过妥协、折衷来达成一致，这使其决策不致走向极端，从而降低了公司的绩效波动程度，这一发现也是与集体决策

³ 具体内容请参见接下来的“文献回顾和评述”。

理论相一致的。进一步地，Cheng (2008)在考察董事会规模对公司绩效波动的中间作用机制时，具体讨论了董事会规模对会计估计项目、非经常性损益项目、分析师预测的不准确程度、长期资本支出、并购和重组活动等可能导致绩效波动的有关因素的影响，进而梳理出相应的作用机制。

而Bebchuk, Cremers, and Peyer (2007)发现，CEO的权力集中度(centrality，即CEO相对于其他高管的重要性程度，用CEO报酬除以前五位高管报酬的合计数来衡量)越大，公司的股票回报波动就会越小。从CEO自身的角度和代理理论来看，这和CEO的风险反感偏好有关。在公司决策中占据主导地位的CEO会进行更为保守的投资决策以维护其地位的安全性。从投资者评价的角度来看，这和市场认为公司经营战略的不确定性下降有关。

John, Litov, and Yeung (2008)认为，投资者保护程度越高，投资者的风险承担能力将会越大，相应地，公司的绩效波动将会更大。原因在于，当投资者保护程度比较差时，公司将会被追求私有利益的、并被过度保护的内部人所控制，而这些私有利益是如此之大，以至于这些内部人会进行次优的、保守的投资项目来维护自己的私有利益，此时，公司的绩效波动就会下降。当投资者保护程度比较高时，这种私有利益就会减少，公司将会进行风险更高、但可以带来价值增值的投资项目。此外，有一些间接研究结果支持此判断，如：Amihud and Lev (1981)发现，权力大的管理层有动机从事一些类似多元化并购这样的降低风险的经营活动；Bertrand and Mullainathan (2003)发现，被反收购法保护的管理层会进行更少的旧厂房改造和新产品开发。

上述文献强调公司治理对风险的影响，事实上，还有一类文献强调风险对公司治理的影响。此时，风险在一定程度上可以被理解为公司经营环境的不确定性。例如，Demsetz and Lehn (1985)指出，公司的潜在控制权安排与经营环境的不确定性直接相关：经营环境的不确定性越大，所有者对公司保持密切控制的回报就会越大，原因在于，这样做会使管理层的道德风险以及相应的代理矛盾得到明显降低，此时，公司的股权集中度在这种情况下将会更高。在实证研究中，他们发现绩效波动和股权集中度之间存在着倒U型关系。Linck, Netter, and Yang (2008)指出，公司董事会的规模和组成是对其契约环境的一种有效反应。Harris and Raviv (2008)认为，董事会规模应该与管理层的私有利益正相关，与监督成本负相关；类似地，Boone, Field, Karpoff, and Raheja (2007)认为，董事会规模事实上反映了公司在私有利益和监督成本之间的一种权衡。从一定意义上来说，公司的绩效波动可以反映出监督成本的高低。绩效波动越大，经营环境的不确定性就越强，监督的成本也就越高，相应地，董事会规模就应该越小。

总结上述关于公司治理与风险关系的研究，我们有如下结论：

一方面，解释经验现象的理论依据的范围进一步扩展，不再仅仅局限于代理理论。例如Adams, Almeida, and Ferreira (2005)以及Cheng (2008)的研究都开始更多地从集体决策理论(group decision-making, Kogan and Wallach, 1966; Sah and Stiglitz, 1986, 1991)和社会心理学的有关文献(Moscovici and Zavalloni, 1969)来寻求理论依据。原因在于，要理解公司层面的风险问题，具体的决策制定过程是非常重要的。例如，Moscovici and Zavalloni (1969)就指出，集体一致(指一个集体所做出的最终选择)所代表的是个体之间立场/判断的一个平均或妥协；Sah and Stiglitz (1986, 1991)指出，由于集体成员之间的意见可能并不一致，这使得集体决策具有意见多元

化的效应，因此，最后的集体决策将是一个反映集体成员不同意见的折衷和妥协；Sah (1991)还指出，更为集权化的社会将有更为波动的经济绩效表现；Almeida and Ferreira (2002)的经验证据表明，该判断在国家层面的增长率波动上是成立的，增长率最高和最低的情况都更有可能发生在集权政府下的国家中。可见，权力集中程度将直接影响集体决策的制订结果，我们有必要从社会学、心理学(而不仅仅是经济学)等学科汲取更多的理论和研究方法。此时，不同公司治理结构所带来的决策权力分布结构的差异需要予以特别注意。

另一方面，公司治理机制影响风险和风险影响公司治理机制这两类不同文献的同时存在提醒我们，在研究公司治理与风险之间的关系时一定要进行必要的内生性检验。

三、研究假设

中国上市公司的典型特征之一是股权结构的特殊性，即国有控股占主导和股权高度集中。为此，本文将考察控股股东性质和股权集中度对经营风险的影响。如前所述，解释公司绩效波动的理论主要是集体决策理论和代理理论，此外，公司经营环境的不确定性也具有重要的影响。接下来我们分别从这三个方面来讨论控股股东性质和股权集中度对公司经营风险的影响。

(一) 股权性质与经营风险

首先，根据集体决策理论，CEO的相对权力越大，其决策极端度的可能性越高，从而导致公司的经营风险越大；反之亦然(Adams, Almeida, and Ferreira, 2005)。在非国有控股的上市公司中，由于中国的经理人市场不是很发达，CEO往往直接来自控股股东，或者是控股股东往往只聘请其充分信任的CEO。此时，CEO与控股股东之间有着比较密切的联系，可以较好地代表控股股东的利益(从某种意义上来说，我们可以把控股股东和CEO理解为一致行动人)，相应地，CEO来自控股股东的授权就会更大，其决策权力也就更大。在国有控股的上市公司中，CEO的决策权力主要受两方面因素的影响，一是来自政府各个部门的监督和约束，二是所有权缺位的严重程度。一方面，在国有控股的上市公司中，CEO面临的来自政府各个部门的监督和压力较多，在其决策过程中并不能只从经济角度来考虑，还要考虑政治、社会等多方面的因素，这使得国有控股公司的CEO决策权力相对较小；另一方面，在国有控股的上市公司中，由于所有权缺位的现象比较严重，代理问题的存在，又会导致CEO的决策权力更大，不会像非国有控股的CEO那样容易受到控股股东的制约。在现实生活中，我们既可以观察到由于所有者缺位，国有企业CEO决策权力过高的现象，也可以观察到由于政府的监督和约束，国有企业CEO决策权力偏低的现象。可见，国有企业CEO的决策权力分布区间是非常广泛的，既有可能很高，也有可能很低，而整体的、平均的国有企业CEO决策能力可能在中等程度。此时，就整体水平来看，非国有控股上市公司的CEO决策权力会高于国有控股上市公司的CEO决策权力。可见，根据集体决策理论，由于非国有控股上市公司的CEO决策权力更大，因此这类公司会有著比国有控股上市公司更大的经营风险。

其次，根据代理理论，当企业被过度保护的内部人所控制时，内部人会进行次优的、保守的投资来维护自己的私有利益(John, Litov, and Yeung, 2008)。因此，经理人员的堑壕效应(management entrenchment，来自于经理人员的自我保护动机)越大，企业的绩效波动将会越小。在非国有控股的上市公司中，CEO的激励机制相对比较完善、与控股股东之间的互动也比较密切，而在国有控股的上市公司中，对CEO的激励并不完善，激励构成和利益函数更加复杂，存在着大量比较灰色的在职消费和非货币收入，这使得国有控股上市公司中的CEO有着较强的自我利益保护和堑壕效应动机。⁴同时，国有控股上市公司中存在的一定程度的所有权缺位现象又为这种自我保护和堑壕效应的实现提供了可能。这些分析表明，国有控股上市公司中的CEO对其地位的安全和稳定性有着特别的偏好，因为被解职的话将意味着大量的在职消费和非货币收入的消失，所以不求有功、但求无过，从而有意进行决策的风险规避。可见，根据代理理论，国有控股上市公司中经理人员更强的自我保护和堑壕效应动机将会带来公司经营绩效波动的降低，其目的在于提高当前职位的稳定性，降低风险水平。

最后，企业所面临的经营环境的不确定性越大，其绩效波动的程度也会越高，经营风险更大。非国有控股的上市公司更有可能处于市场高度竞争的行业，其所面临的经营环境具有更大的不确定性，而从1990年代开始的国有企业改革，总体上还是贯彻“抓大放小”、“退出竞争性领域”的指导思想，因此，国有控股的上市公司更有可能处于市场竞争程度相对较低的行业。同时，当公司面临经营困难时，国有控股的上市公司更容易获得来自政府有关部门的支持，从而降低经营风险。可见，更强的产业竞争程度、更少的政府支持所带来的经营环境不确定性会导致非国有控股的上市公司有着更高的经营风险。

总结上述分析，我们可以得出如下研究假设：

H1：非国有控股上市公司的经营风险比国有控股上市公司的要高。

(二) 股权集中度与经营风险

在考察股权集中度与经营风险之间的关系时，由于国有控股股东和非国有控股股东在产权的行使方式方面存在着明显差别，我们有必要按照控股股东性质分别加以考察。

在国有企业中，股权集中度过高的话，作为国家的代表，政府在企业中的影响力会更强。较高的股权集中度意味着政府的监管更到位、更有效，CEO的决策权力更小，因而可能导致较低的风险。但是，以下两个方面因素的存在，会导致国有企业的股权集中度越高，经营风险越高：一是较高的股权集中度所产生的来自政府部门的更为有效的监督，会减轻代理问题的严重程度，从而降低CEO从事堑壕行为的可能性，因此，CEO在股权集中度较高的情况下，同样有可能愿意承担风险，以提

⁴ 因为一旦丧失职位，国有控股上市公司经理人员所拥有的各种在职消费和非货币收入将会消失，而且由于其参与人力资本市场的市场化程度不足，他/她也很难在经理人市场上顺利更换工作；非国有控股上市公司的经理人员则不同，其收入构成中货币化收入所占比重较高，而且他/她可以相对比较容易地在经理人市场上找到合适的工作。

高公司的回报和价值；二是从政府的角度来看，其国有资产已经在全社会实现了资产配置的高度分散，因此其并不需要对风险进行过度的规避。此时，我们预期在股权集中度较高的国有企业样本中，国有控股股东的的影响力更强所带来的效果应该更多地体现为决策效应，即更高的经营风险。

另一方面，在国有企业中，如果股权集中度过低、股权比较分散，所有者缺位现象就会更为严重，CEO的影响力将会更大。而其最终的效果如何则受制于在CEO的决策过程中，到底是堑壕效应占主导地位还是决策效应占主导地位。如果堑壕效应占主导地位，则经营风险会更低，如果决策效应占主导地位，则经营风险会更高，这是一个需要进行实证检验的问题。⁵

同时，较低的国有股权更有可能发生控制权争夺，因而导致经营环境不稳定和较高的经营风险，而较高的国有股权却可以避免控制权争夺的发生(朱红军、汪辉，2004)。

综合决策效应、堑壕效应和经营环境不确定性的影响，我们提出如下研究假设：

H2：在国有控股的上市公司中，股权集中度与经营风险之间是非线性的U型关系，即股权集中度较高或较低都会导致较高的经营风险。

在非国有企业中，其控股股东是一个明晰的、具有终极意义的产权行使主体。一方面，基于决策权力假设，由于控股股东持股水平的提高，控股股东的决策权力或者是代表其利益的CEO的决策权力更大，其所受到的制约会更少，此时，他们所做的决策更容易走向极端，产生出更好经营绩效或者更差经营绩效的可能性都大为增加，从而提高了公司的经营风险。但另一方面，基于堑壕效应和风险规避假设，控股股东在持股比例提升的同时，控制权利益也会提升，同时，由于投资的资产越来越变成主要是自有的，这些都会使控股股东具有更大的风险规避倾向。可见，在非国有控股的上市公司中，决策权力假设预期股权集中度与经营风险之间存在正相关关系，而堑壕效应假设和风险规避假设则预期股权集中度与经营风险之间存在负相关关系，最终的结果则取决于两种效应何者占主导地位。最后，股权分散会导致控制权争夺风险，从而产生经营环境的不确定性，此时，在股权集中度较低的公司中，风险会较高。可见，我们在非国有控股的上市公司中无法预测出较为一致的股权集中度与经营风险之间的关系，这是一个有待检验的实证问题。⁶

就全部样本来说，由于在我们的研究样本中国有控股的上市公司占到了四分之三左右的比例，因此我们预期全部上市公司样本的回归结果应该与国有控股上市公司子样本的回归结果比较一致。

⁵ 从后文的实证结果来看，我们所观察到的主要是决策效应占主导地位，即国有企业中股权集中度过低所带来的CEO影响力增强主要体现为决策效应占主导地位。另外，需要指出的是，前面股权性质部分对CEO影响能力的分析是基于国有控股公司与非国有控股公司之间的比较基础上的，而此处则是仅仅针对国有控股公司来比较在股权集中度过低时，CEO的决策效应和堑壕效应哪个占主导地位。

⁶ 从后文的实证结果来看，我们并未在非国有控股的上市公司中观察到显著的股权集中度与经营风险之间的关系。

四、研究设计和实证结果

(一) 实证模型

我们从两个角度考察上市公司的经营风险，一个角度是基于公司内的跨期经营风险(within-firm, over-time variability of corporate operating performance)，此时的样本观测值是以公司为单位的；另一个角度是基于公司间的(across-firm)，此时的样本观测值是以公司一年度为单位的。

参照Adams, Almeida and Ferreira (2005)以及Cheng (2008)等的研究，我们构建以下基于公司样本的实证研究模型：

$$F_SDROA = c + \alpha_1 F_FIRP + \alpha_2 F_FIRSQ + \alpha_3 F_GOV + \sum \beta_i F_OTHERCG_i + \sum \gamma_i F_FC_i + \sum \lambda_i F_IND_i + \varepsilon \quad (1)$$

其中，“ $F_$ ”表示所使用的是公司层面的观测值， F_SDROA 为样本期间各家公司年度总资产报酬率(ROA)的标准差，用来衡量经营风险， F_SDROA 越大，经营风险越大。 F_FIRP 为样本期间各家公司年末第一大股东持股比例的均值，用以衡量股权集中度。 F_FIRSQ 为样本期间各家公司年末第一大股东持股比例均值的平方，用以检验可能的非线性关系。 F_GOV 为控股股东性质虚拟变量，为样本期间各年公司股权性质虚拟变量(1为国有控股，0为非国有控股)的均值。⁷此外，我们还控制了其它公司治理特征、公司财务和组织结构特征、以及行业等方面的变量。 $F_OTHERCG$ 为样本期间各家公司其他公司治理变量的均值，包括董事长和总经理是否兼任虚拟变量、董事会规模的自然对数、独立董事比例； F_FC 为样本期间各家公司一系列公司特征变量的均值，包括资产负债率、本期和上期的资本支出水平、营业收入增长率、本期和上期的盈利水平ROA、总资产的自然对数、上市年龄的自然对数、多元化程度(部门数)； F_IND 为一系行业虚拟变量。

为估计出公司一年度层面的经营风险，我们采用Glejser (1969)所提出的异方差检验(Glejser's heteroskedasticity test)方法来进行经营风险的定量估计。具体来说，我们首先需要估计出公司经营绩效的预测模型，并以此预测模型的残差绝对值作为经营风险的衡量指标，并进行有关的实证分析。我们所使用的经营绩效预测模型说明如下：

$$FY_ROA = c + \alpha_1 FY_FIRP + \alpha_2 FY_FIRSQ + \alpha_3 FY_GOV + \sum \beta_i FY_OTHERCG_i + \sum \gamma_i FY_FC_i + \sum \lambda_i FY_IND_i + \sum \theta_i FY_YR_i + \varepsilon \quad (2)$$

其中，“ $FY_$ ”表示所使用的是公司一年度观测值； FY_ROA 为各公司的年度总资产报酬率ROA； FY_FIRP 为各公司年初的第一大股东持股比例； FY_FIRSQ 为各公司年初的第一大股东持股比例的平方； FY_GOV 为控股股东性质虚拟变量，1为国有控股，0为非国有控股； $FY_OTHERCG$ 为各公司当年的其他公司治理变量，包括董事长和总经理是否兼任虚拟变量、董事会规模的自然对数、独立董事比例； FY_FC 为各公司的一系列公司特征变量，包括年初的资产负债率、本期和上期的资本支出水平、当年的营业收入增长率、年初总资产的自然对数、当年上市年龄的自然对数、当年的多元化程度(部门数)； FY_IND 为一系行业虚拟变量； FY_YR 为一系年度虚拟变量。⁹

⁷ 显然，如果 F_GOV 等于1，则说明该公司在样本期间内一直为国有产权控股，股权性质未发生改变；如果 F_GOV 等于0，则说明该公司在样本期间内一直为非国有产权控股，股权性质未发生改变；如果 F_GOV 在0和1之间，则说明该公司在样本期间内发生过股权性质变更。

⁸ 如果股权集中度的平方项不显著，一次项显著，则在预测模型中仅包含股权集中度的一次项。

⁹ 此处引入年度虚拟变量的好处是在一定程度上控制各年度国家经济环境等宏观因素的影响。

表1 变量定义表

	变量名称	定义
因变量	<i>FY_AROA</i>	来自预测模型(2)中的残差绝对值
股权结构	<i>FY_FIRP</i>	股权集中度, 各家公司的年初第一大股东持股比例(%)
	<i>FY_FIRSQ</i>	股权集中度平方, 各家公司的年初第一大股东持股比例(%)的平方
	<i>FY_GOV</i>	年初的控股股东性质虚拟变量, 国有控股为1, 非国有控股为0
其他公司治理变量	<i>FY_DUALITY</i>	兼任虚拟变量, 如果年初上市公司CEO兼任董事长, 则该指标为1, 否则为0
	<i>FY_LNBDSIZE</i>	董事会规模, 年初的董事会规模(单位: 人)自然对数
	<i>FY_INDRATIO</i>	董事会结构, 年初的独立董事比例(独立董事人数/董事会人数, %)
公司特征变量	<i>FY_LEV</i>	财务杠杆程度, 年初的资产负债率=总负债/总资产(%)
	<i>FY_CAP</i>	当年的资本支出水平=资本支出/折旧和摊销
	<i>FY_CAPL1</i>	上年的资本支出水平
	<i>FY_GR</i>	成长性, 当年的营业收入增长率=当年的营业收入增长额/上年的营业收入(%)
	<i>FY_ROA</i>	经营绩效, 当年的总资产报酬率=息税前利润/平均总资产(%)
	<i>FY_ROAL1</i>	上年的总资产报酬率(%)
	<i>FY_LNTA</i>	规模, 年初总资产(单位: 元)的自然对数
	<i>FY_LNAGE</i>	上市年龄, 当年上市年龄(单位: 年)的自然对数
	<i>FY_SEGNUM</i>	多元化程度, 当年的行业分部数量(单位: 个)
	行业虚拟变量	<i>FY_IND</i>
年度虚拟变量	<i>FY_YR</i>	年度虚拟变量

注: 此表报告公司一年度数据变量的定义。原始数据来源: 公司治理数据部分来自CSMAR数据库、部分来自手工收集, 公司特征数据和行业数据来自WIND数据库。

预测模型(2)中的残差绝对值就是我们所需要的基于公司一年度层面的经营风险 FY_AROA 。接下来,我们考察回归模型(2)中的各个自变量,尤其是股权结构和股权性质对 FY_AROA 的影响效果。

表1列示了本研究公司一年度层面主要变量的具体定义。¹⁰

(二) 研究样本及描述性统计分析

我们所选取的公司一年度样本为2000至2007年间的深沪主板上市公司,初始观察值为9907个,剔除关键数据缺失后的样本数量为8586个。在具体进行前述的实证研究时,为缓解极端值对实证结果的不利影响,我们对股权集中度、股权集中度的平方、独立董事比例、负债率、当年和上年的资本支出、成长性、当年和上年的ROA、总资产的自然对数等连续型的数据变量按照1%的标准进行了winsorize。

在确定公司层面的研究样本时,我们以前面的8586个公司一年度观测值为分析起点,并要求计算有关指标的公司必须至少有连续两年的统计数据,最终,我们获得了1193个公司层面的观测值。类似地,为缓解极端值对实证结果的不利影响,我们对样本期内的ROA标准差、股权集中度均值、股权集中度均值的平方、独立董事比例均值、负债率均值、当年和上年的资本支出均值、成长性均值、当年和上年的ROA均值、总资产的自然对数均值等连续型的数据变量按照1%的标准进行了winsorize。

表2对公司样本和公司年度样本的主要变量进行了描述性统计分析。我们看到,就公司样本来说,其样本期内的ROA标准差在0.34%到56.73%之间,其均值(中位数)为5.79%(3.25%);各公司平均的第一大股东持股比例在12.52%到74.89%,其均值(中位数)为42.51%(41.72%)。就公司一年度样本来说,其ROA预测模型的残差绝对值在0.0002%(近似为0.00)到40.28%之间,其均值(中位数)为4.60%(3.00%);各公司一年度样本的第一大股东持股比例在11.03%到75.00%,其均值(中位数)为42.42%(41.34%)。整体来看,约有四分之三左右的样本属于国有控制,四分之一左右的样本属于非国有控制。

表3报告了公司样本和公司一年度样本中主要变量之间的相关性分析结果。由表3我们可以发现,各自变量之间基本上不存在严重的多重共线性问题,但是,股权集中度和股权集中度平方之间存在着高度正相关关系;在公司样本中,当期和上期资本支出之间,以及当期和上期ROA之间存在着高度正相关关系。不过,我们在第五部分的可靠性检验中发现这些高度相关关系并不影响文章的结论。¹¹

¹⁰ 除 F_SDROA 为样本期间各家公司年度总资产报酬率(ROA)的标准差以外,其他公司层面的变量基本上都是各个公司在样本期间有关变量的均值,故公司层面的变量定义列示从略。

¹¹ 在可靠性检验中,我们使用均值调整之后的股权集中度及其平方,以消除二者之间的高度正相关关系;我们也在公司样本中使用去掉当期资本支出均值和当期ROA均值之后的回归模型进行有关检验;实证结果未发生明显改变。具体内容请参见第五部分的“可靠性分析”部分。

表2 描述性统计分析

Panel A：公司样本(1193观测值)					
	均值	中位数	标准差	最小值	最大值
<i>F_SDROA</i>	5.79	3.25	8.14	0.34	56.73
<i>F_FIRP</i>	42.51	41.72	15.55	12.52	74.89
<i>F_FIRSQ</i>	2049.11	1740.23	1368.17	156.69	5608.51
<i>F_GOV</i>	0.75	1.00	0.39	0.00	1.00
<i>F_DUALITY</i>	0.13	0.00	0.25	0.00	1.00
<i>F_LNBDSIZE</i>	2.25	2.22	0.19	1.53	2.92
<i>F_BDSIZE</i>	9.65	9.25	1.87	4.60	18.50
<i>F_INDRATIO</i>	23.59	22.39	6.43	10.31	40.74
<i>F_LEV</i>	48.15	46.85	18.34	12.34	126.49
<i>F_CAP</i>	3.11	2.42	2.63	0.23	17.59
<i>F_CAPLI</i>	3.39	2.67	2.71	0.24	15.43
<i>F_GR</i>	33.10	21.51	59.18	-15.46	469.03
<i>F_ROA</i>	4.46	4.75	5.69	-19.78	17.84
<i>F_ROALI</i>	4.67	5.10	5.42	-18.40	16.80
<i>F_LNTA</i>	21.15	21.05	0.86	19.28	23.79
<i>F_TA</i>	2.97×10^9	1.39×10^9	1.30×10^{10}	1.28×10^8	3.95×10^{11}
<i>F_LNAGE</i>	1.87	1.95	0.41	0.92	2.71
<i>F_AGE</i>	7.02	7.00	2.75	2.50	15.00
<i>F_SEGNUM</i>	2.25	2.00	1.14	1.00	5.00
Panel B：公司一年度样本(8586观测值)					
	均值	中位数	标准差	最小值	最大值
<i>FY_AROA</i>	4.60	3.00	5.36	0.00	40.28
<i>FY_FIRP</i>	42.42	41.34	16.81	11.03	75.00
<i>FY_FIRSQ</i>	2081.83	1708.87	1490.68	121.66	5625.00
<i>FY_GOV</i>	0.76	1.00	0.43	0.00	1.00
<i>FY_DUALITY</i>	0.13	0.00	0.34	0.00	1.00
<i>FY_LNBDSIZE</i>	2.23	2.20	0.24	0.00	2.94
<i>FY_BDSIZE</i>	9.59	9.00	2.31	1.00	19.00
<i>FY_INDRATIO</i>	22.50	30.77	15.50	0.00	45.45
<i>FY_LEV</i>	48.33	47.58	21.20	8.22	138.49
<i>FY_CAP</i>	2.86	1.66	3.71	0.01	22.71
<i>FY_CAPLI</i>	3.09	1.76	4.08	0.01	24.91
<i>FY_GR</i>	24.35	15.36	57.07	-72.43	377.02
<i>FY_ROA</i>	4.47	5.02	7.88	-33.14	23.93
<i>FY_ROALI</i>	4.73	5.33	7.29	-28.74	22.29
<i>FY_LNTA</i>	21.10	21.01	0.92	19.06	23.82
<i>FY_TA</i>	2.81×10^9	1.34×10^9	1.06×10^{10}	3.07×10^6	4.60×10^{11}
<i>FY_LNAGE</i>	1.89	1.95	0.53	0.00	2.89
<i>FY_AGE</i>	7.45	7.00	3.36	1.00	18.00
<i>FY_SEGNUM</i>	2.28	2.00	1.41	1.00	5.00

注：*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。

表3 相关性分析

Pand A: 公司样本	F_SDR0A	F_FIRP	F_FIRSQ	F_GOV	F_DUALITY	F_LNBSIZE	F_INDRATIO	F_LEV	F_CAP	F_CAPLI	F_GR	F_ROA	F_ROALI	F_LNTA	F_LMAGE	F_SEGNUM
F_SDR0A	1															
F_FIRP	-0.134	1														
F_FIRSQ	0.000	1.000	1													
F_GOV	0.000	0.000	0.000	1												
F_DUALITY	-0.145	0.000	0.000	0.000	1											
F_LNBSIZE	0.000	0.000	0.000	0.000	0.000	1										
F_INDRATIO	-0.159	0.361	0.351	0.000	-0.157	0.149	1									
F_LEV	0.000	0.000	0.000	0.000	0.000	0.000	0.127	1								
F_CAP	0.030	-0.106	-0.105	-0.124	0.000	-0.010	-0.130	0.091	1							
F_CAPLI	0.305	0.000	0.000	0.000	0.000	0.740	0.000	0.002	0.045	1						
F_GR	-0.110	-0.049	-0.047	0.152	0.003	0.000	-0.105	0.011	-0.020	-0.021	1					
F_ROA	0.000	0.089	0.104	0.000	0.921	0.000	0.000	0.703	0.494	0.468	0.508	1				
F_ROALI	-0.171	0.021	0.018	-0.089	-0.071	-0.071	0.000	-0.111	0.208	0.247	0.106	0.233	1			
F_LMAGE	0.460	0.544	0.544	0.002	0.015	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1		
F_SEGNUM	-0.505	-0.161	-0.152	-0.049	0.036	-0.012	-0.125	0.000	-0.142	-0.112	0.074	-0.316	-0.395	0.096	1	
F_SDR0A	0.000	0.000	0.000	0.089	0.213	0.683	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.001	0.000	1
F_FIRP	-0.180	-0.034	-0.026	-0.119	-0.006	-0.037	0.145	-0.127	0.899	0.899	0.246	0.343	0.402	0.105	-0.324	0.032
F_FIRSQ	0.000	0.236	0.363	0.000	0.827	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.264	0.264
F_GOV	-0.161	-0.045	-0.038	-0.143	-0.013	-0.034	0.213	-0.100	0.851	1	0.224	0.281	0.352	0.098	-0.399	0.039
F_DUALITY	0.000	0.120	0.194	0.000	0.642	0.241	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.180
F_LNBSIZE	0.111	-0.048	-0.045	-0.052	0.024	-0.027	-0.022	0.135	0.029	0.019	1	0.340	0.298	0.099	-0.085	0.002
F_INDRATIO	0.000	0.096	0.122	0.071	0.415	0.344	0.441	0.000	0.321	0.508	0.000	0.000	0.000	0.001	0.003	0.948
F_LEV	-0.564	0.212	0.212	0.103	-0.059	0.088	0.225	-0.412	0.232	0.200	-0.028	1	0.932	0.315	-0.192	-0.034
F_CAP	0.000	0.000	0.000	0.000	0.040	0.002	0.000	0.000	0.000	0.000	0.340	0.000	0.000	0.000	0.236	0.236
F_CAPLI	-0.663	0.222	0.219	0.087	-0.079	0.082	0.230	-0.541	0.274	0.251	-0.080	0.895	1	0.331	-0.255	-0.047
F_GR	0.000	0.000	0.000	0.003	0.006	0.005	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.106	0.106
F_ROA	0.000	0.234	0.249	0.000	-0.055	0.241	0.065	0.010	0.050	0.054	-0.086	0.334	0.355	1	0.026	-0.013
F_ROALI	0.000	0.000	0.000	0.000	0.060	0.000	0.024	0.731	0.085	0.060	0.003	0.000	0.000	0.000	0.372	0.649
F_LMAGE	0.157	-0.153	-0.145	0.037	0.023	-0.067	-0.576	0.217	-0.244	-0.341	0.070	-0.171	-0.232	0.014	1	0.177
F_SEGNUM	0.000	0.000	0.000	0.196	0.437	0.020	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.619	0.000	0.000
F_SDR0A	-0.033	-0.160	-0.142	-0.053	0.015	0.001	-0.088	0.068	0.032	0.042	-0.023	-0.012	-0.018	0.008	0.159	1
F_FIRP	0.261	0.000	0.000	0.069	0.614	0.978	0.002	0.020	0.276	0.150	0.436	0.688	0.540	0.770	0.000	0.000

注：左下角报告的是Pearson相关系数，右上角报告的是Spearman相关系数；每一变量的第一行报告的是相关系数，第二行报告的是显著性水平。F_SDR0A是样本期间内各家公司年度总资产报酬率的标准差。其它变量定义见表1。

表3 (续) 相关性分析

Panel B:
公司一年度样本

	FY_AROA	FY_FRP	FY_FRSQ	FY_GOV	FY_DUALITY	FY_LNBDSIZE	FY_INDRATIO	FY_LEV	FY_CAP	FY_CAPLI	FY_GR	FY_ROA	FY_ROALI	FY_LNTA	FY_LNAGE	FY_SEGNUM
FY_AROA	1	-0.090	-0.090	-0.099	0.015	-0.062	0.030	0.038	-0.136	-0.126	-0.063	0.063	0.031	-0.121	0.089	-0.040
FY_FRP	-0.108	1	1.000	0.000	0.152	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000
FY_FRSQ	0.000	0.000	1	0.000	-0.066	-0.039	-0.111	-0.178	0.069	0.051	0.047	0.117	0.159	0.155	-0.265	-0.163
FY_GOV	-0.098	0.983	0.000	0.000	-0.066	-0.039	-0.111	-0.178	0.069	0.051	0.047	0.117	0.159	0.155	-0.265	-0.163
FY_DUALITY	0.000	0.000	0.000	0.000	1	0.000	-0.145	-0.082	0.012	-0.009	0.015	0.001	0.015	0.153	-0.079	-0.075
FY_LNBDSIZE	0.000	0.000	0.000	0.000	0.000	1	0.000	0.000	0.276	0.430	0.155	0.946	0.171	0.000	0.000	0.000
FY_INDRATIO	0.012	-0.067	-0.065	-0.064	1	-0.025	-0.044	0.003	0.013	0.008	-0.015	-0.008	-0.006	-0.056	-0.031	-0.014
FY_LEV	0.259	0.000	0.000	0.000	0.000	0.022	0.000	0.787	0.226	0.484	0.154	0.464	0.553	0.000	0.004	0.208
FY_CAP	-0.068	-0.040	-0.040	0.116	-0.021	1	-0.010	0.005	0.033	0.037	0.037	0.018	0.031	0.180	-0.024	0.024
FY_CAPLI	0.000	0.000	0.000	0.000	0.046	0.020	0.377	0.657	0.002	0.001	0.001	0.093	0.004	0.000	0.029	0.023
FY_GR	0.046	-0.110	-0.115	-0.143	-0.058	0.067	1	0.192	-0.058	-0.017	0.023	0.007	-0.122	0.186	0.362	0.123
FY_ROA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118	0.031	0.531	0.000	0.000	0.000	0.000
FY_ROALI	0.163	-0.181	-0.170	-0.094	0.013	-0.010	0.177	1	-0.181	-0.127	-0.012	-0.168	-0.316	0.167	0.304	0.108
FY_LNTA	0.000	0.000	0.000	0.000	0.236	0.337	0.000	0.000	0.000	0.000	0.262	0.000	0.000	0.000	0.000	0.000
FY_LNAGE	-0.090	0.017	0.019	-0.036	0.024	-0.018	-0.083	-0.155	1	0.551	0.219	0.305	0.383	0.093	-0.265	0.016
FY_SEGNUM	0.000	0.112	0.080	0.001	0.028	0.096	0.000	0.000	0.415	0.000	0.000	0.000	0.000	0.000	0.135	0.032
	-0.077	0.007	0.009	-0.054	0.006	-0.012	-0.055	-0.114	0.000	1	0.175	0.174	0.318	0.133	-0.286	0.032
	0.000	0.525	0.391	0.000	0.566	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003
	-0.039	-0.004	-0.004	-0.032	-0.001	0.001	-0.001	0.020	0.068	0.059	1	0.369	0.162	0.059	-0.092	0.019
	0.000	0.719	0.712	0.003	0.900	0.913	0.938	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
	-0.430	0.131	0.131	0.051	-0.016	0.038	0.014	-0.182	0.175	0.090	0.248	1	0.699	0.118	-0.112	-0.051
	0.000	0.000	0.000	0.000	0.149	0.000	0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	-0.165	0.166	0.164	0.064	-0.019	0.049	-0.094	-0.418	0.229	0.188	0.035	0.498	1	0.126	-0.264	-0.083
	0.000	0.000	0.000	0.000	0.079	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
	-0.144	0.169	0.175	0.164	-0.062	0.201	0.193	0.052	-0.010	0.024	-0.047	0.150	0.204	1	0.127	0.052
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.024	0.000	0.000	0.000	0.000	0.000	0.000
	0.111	-0.248	-0.247	-0.071	-0.032	-0.010	0.359	0.300	-0.244	-0.259	-0.019	-0.100	-0.226	0.113	1	0.204
	0.000	0.000	0.000	0.000	0.003	0.335	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.000	0.000	0.000
	-0.045	-0.152	-0.138	-0.064	-0.014	0.032	0.132	0.084	0.001	0.011	0.017	-0.016	-0.040	0.052	0.193	1
	0.000	0.000	0.000	0.000	0.189	0.003	0.000	0.000	0.904	0.318	0.117	0.146	0.000	0.000	0.000	0.000

注：左下角报告的是Pearson相关系数，右上角报告的是Spearman相关系数；每一变量的第一行报告的是相关系数，第二行报告的是显著性水平。FY_SDROA是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。

就各自变量与因变量之间的相关性情况来看,在公司样本中,经营风险与股权集中度、股权集中度平方、国有控股、董事会规模、独立董事比例、当期和上期资本支出、当期和上期ROA、规模等因素呈显著的负相关关系,与负债率、成长性、上市年龄等因素呈显著的正相关关系;在公司一年度样本中,经营风险与股权集中度、股权集中度平方、国有控股、董事会规模、当期和上期资本支出、成长性、当期和上期ROA、规模、多元化程度等因素呈显著的负相关关系,与独立董事比例、负债率、上市年龄等因素呈显著的正相关关系。但是,这些关系是否可靠、最终结论如何还要视多元回归分析的结果而定。

(三) 比较分析

表4报告了不同控股股东性质组别下的公司经营风险的比较结果。

按照股权性质及其在样本期内是否发生改变,全部的公司样本可以分为样本期内一直国有控股的样本(GROUP 1, 787观测值)、样本期内一直非国有控股的样本(GROUP 2, 194观测值)、期初国有控股但期末非国有控股的样本(GROUP 3, 185观测值)、期初非国有控股但期末国有控股的样本(13观测值)、期初和期末均为国有控股但期间发生过股权性质变更的样本(11观测值)、以及期初和期末均为非国有控股但期间发生过股权性质变更的样本(3观测值)。¹²基于样本数量的考虑,我们仅对前三组样本进行经营绩效的比较检验。从均值检验和中位数检验的实证结果来看,一直非国有控股样本和国有控股转变为非国有控股样本的经营风险要明显地高于一直国有控股样本,而一直非国有控股样本和国有控股转变为非国有控股样本之间的经营风险比较并无明确的结论(均值比较表明二者之间不存在明显差别,中位数比较表明后者的经营风险较高)。

表4 控股股东性质与经营风险之比较检验

Panel A:	GROUP 1	GROUP 2	GROUP 3
<i>F_SDROA</i>	(样本期内一直国有控股)	(样本期内一直非国有控股)	(期初国有控股、期末非国有控股)
均值	4.7187	7.0150	8.1211
中位数	2.9321	3.0945	5.0245
观测值	787	194	185
	GROUP 1 vs GROUP 2	GROUP 1 vs GROUP 3	GROUP 2 vs GROUP 3
均值检验	2.921***	4.389***	1.046
中位数检验	1.866*	6.291***	3.287***
Panel B:	GROUP 4	GROUP 5	GROUP 4 vs GROUP 5
<i>FY_AROA</i>	(国有控股样本)	(非国有控股样本)	
均值	4.2667	5.6497	均值检验 8.907***
中位数	2.7878	3.6437	中位数检验 9.152***
观测值	6541	2045	-

注: GROUP 1表示样本期内一直国有控股的公司样本, GROUP 2表示样本期内一直非国有控股的公司样本、GROUP 3表示期初国有控股但期末非国有控股的公司样本, GROUP 4为国有控股的公司一年度样本, GROUP 5为非国有控股的公司一年度样本。*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。比较检验中的均值检验所报告的是T统计量,中位数检验所报告是Mann-Whitney Z统计量。***表示在1%的统计水平上显著,**表示在5%的统计水平上显著,*表示在10%的统计水平上显著。

¹² 后三组由于样本量太小,无法比较。

按照控股股东性质，我们把全部的公司一年度样本分为两组，一组为国有控股样本(GROUP 4, 6541观测值)、一组为非国有控股样本(GROUP 5, 2045观测值)。从均值检验和中位数检验的结果来看，非国有控股样本的经营风险要明显地高于国有控股样本。

总之，比较分析的结果支持我们前面所提出的假设，即非国有控股的上市公司有着比国有控股上市公司更大的经营风险。当上市公司的股权性质由国有变为非国有时，其经营风险会变得更大。根据前面的分析，这可能与非国有产权控股的上市公司中CEO的决策权力更大、CEO的堑壕效应程度更小以及经营环境的不确定性程度更高有关。

(四) 回归分析

表5列示了全部样本的回归分析结果。在控制其他影响因素的情况下，回归分析(3)、(4)、(7)、(8)都表明，无论是针对公司样本，还是公司一年度样本，我们都可以看到，国有控股上市公司的经营风险要显著地低于非国有控股的上市公司。这一回归分析结果与前面的比较分析结论相一致，都说明非国有控股的上市公司有着比国有控股的上市公司更大的经营风险。同时，与之前的研究相参照，我们注意到，回归分析(1)、(2)、(5)、(6)的结果表明，国有控股上市公司的经营绩效与非国有控股上市公司的经营绩效水平之间并不存在显著差别，这与徐莉萍、辛宇、陈工孟(2006b)的实证研究结论是一致的。

就股权集中度与经营风险之间的关系来看，在控制住其他影响因素的情况下，回归分析(3)、(4)、(7)、(8)表明，无论是针对公司样本，还是公司一年度样本，股权集中度与经营风险之间不存在线性关系，但是存在显著的非线性U型关系，即股权集中度与经营风险之间有显著负相关的回归系数，同时股权集中度平方与经营风险之间有显著正相关的回归系数。

表6和表7的分样本回归分析表明，上述股权集中度与经营风险之间的非线性U型关系主要在国有控股的上市公司中存在(参见表6的回归分析(3)、(4)、(7)、(8))，在民营控股的上市公司中并不存在(参见表7的回归分析(3)、(4)、(7)、(8))。结合前面研究假设部分的分析，我们认为导致这样实证结果的原因在于：在国有控股的上市公司中，股权过于集中会产生决策权力更为集中的政府决策主体，股权过于分散会产生决策权力更为集中的CEO决策主体，而二者的影响力主要体现为决策效应而不是堑壕效应/风险规避效应，进而产生股权集中度与经营风险之间的非线性U型关系；在非国有控股的上市公司中，随着股权集中度的增加，控股股东的决策效应和堑壕效应旗鼓相当，而相互抵消的结果导致股权集中度与经营风险之间不存在显著的影响关系。

与之前的研究相参照，我们注意到，表6和表7的回归分析(1)、(2)、(5)、(6)的结果表明，无论是在国有控股的上市公司中，还是在非国有控股的上市公司中，股权集中度与经营绩效之间都存在着显著的正向线性关系，即股权集中度越高，上市公司的经营绩效越好；同时，非国有控股上市公司的股权集中度影响系数要明显地高于国有控股上市公司的股权集中度影响系数(参见表6和表7的回归分析(2)、(6))，这与徐莉萍、辛宇、陈工孟(2006a)的实证研究结论也是一致的。

表5 全部样本的回归分析

	公司样本				公司-年度样本			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.041 (0.83)	0.033 (3.33)***	-0.138 (-2.24)**	0.012 (0.96)	0.015 (0.59)	0.041 (7.85)***	-0.089 (-5.38)***	-0.001 (-0.23)
<i>FIRSQ</i>	0.000 (-0.16)		0.002 (2.49)**		0.000 (1.06)		0.001 (5.45)***	
<i>GOV</i>	0.029 (0.07)	0.031 (0.08)	-2.287 (-4.71)***	-2.330 (-4.79)***	-0.210 (-1.04)	-0.223 (-1.11)	-0.648 (-4.93)***	-0.693 (-5.28)***
<i>DUALITY</i>	-0.039 (-0.07)	-0.038 (-0.07)	-1.468 (-2.14)**	-1.488 (-2.16)**	-0.124 (-0.54)	-0.125 (-0.54)	-0.040 (-0.27)	-0.041 (-0.28)
<i>LNBSIZE</i>	1.066 (1.39)	1.068 (1.40)	-1.541 (-1.63)	-1.575 (-1.66)*	0.623 (1.86)*	0.620 (1.85)*	-0.448 (-2.05)**	-0.458 (-2.09)**
<i>INDRATIO</i>	0.155 (5.88)***	0.155 (5.88)***	-0.076 (-2.30)**	-0.077 (-2.34)**	0.037 (3.03)***	0.037 (3.03)***	-0.002 (-0.21)	-0.002 (-0.25)
<i>LEV</i>	-0.115 (-14.62)***	-0.115 (-14.64)***	0.113 (9.63)***	0.113 (9.61)***	-0.058 (-14.77)***	-0.058 (-14.73)***	0.032 (11.66)***	0.033 (11.87)***
<i>CAP</i>	0.386 (3.93)***	0.386 (3.93)***	0.028 (-0.23)	-0.022 (-0.18)	0.274 (11.82)***	0.274 (11.83)***	0.005 (0.30)	0.005 (0.30)
<i>CAPLI</i>	-0.035 (-0.35)	-0.035 (-0.35)	-0.048 (-0.40)	-0.047 (-0.39)	0.005 (0.24)	0.005 (0.24)	-0.044 (-3.20)***	-0.044 (-3.20)***
<i>GR</i>	0.005 (2.26)**	0.005 (2.26)**	0.003 (0.99)	0.003 (1.04)	0.034 (24.96)***	0.034 (24.96)***	0.007 (7.43)***	0.007 (7.40)***
<i>ROA</i>			0.088 (1.30)	0.093 (1.38)			-0.342 (-43.82)***	-0.341 (-43.68)***
<i>ROALI</i>			-0.840 (-10.56)***	-0.849 (-10.66)***			0.127 (14.10)***	0.127 (14.06)***
<i>LNTA</i>	1.836 (10.43)***	1.833 (10.48)***	-0.779 (-3.33)***	-0.712 (-3.06)***	1.081 (11.57)***	1.087 (11.67)***	-0.732 (-11.69)***	-0.710 (-11.35)***
<i>LNAGE</i>	0.861 (1.92)*	0.861 (1.92)*	-0.661 (-1.19)	-0.667 (-1.20)	-0.629 (-3.46)***	-0.634 (-3.48)***	0.561 (4.72)***	0.547 (4.59)***
<i>SEGNUM</i>	0.150 (1.16)	0.148 (1.16)	-0.371 (-2.34)**	-0.345 (-2.17)**	0.083 (1.40)	0.087 (1.46)	-0.255 (-6.59)***	-0.243 (-6.28)***
行业	控制	控制	控制	控制	控制	控制	控制	控制
年份					控制	控制	控制	控制
观测值	1193	1193	1193	1193	8586	8586	8586	8586
ADJ. R ²	0.3498	0.3503	0.5169	0.5147	0.1932	0.1932	0.2584	0.2559
F统计量	19.86***	20.48***	36.42***	37.12***	51.13***	52.38***	70.56***	71.29***

注：出于篇幅节省的考虑，公司样本自变量中的“*F_*”符号和公司一年度样本自变量中的“*FY_*”符号予以省略。常数项的回归结果列示从略。*F_SDROA* 是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。括号内的数字为T统计量，***表示在1%的统计水平上显著，**表示在5%的统计水平上显著，*表示在10%的统计水平上显著。

表6 国有控股子公司样本的回归分析

	公司样本				公司-年度样本			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.017 (0.30)	0.027 (2.56)**	-0.146 (-2.20)**	0.009 (0.73)	-0.001 (-0.04)	0.032 (5.86)***	-0.091 (-4.90)***	0.000 (-0.10)
<i>FIRSQ</i>	0.000 (0.18)		0.002 (2.38)**		0.000 (1.20)		0.001 (4.98)***	
<i>DUALITY</i>	-0.585 (-0.90)	-0.586 (-0.90)	-0.738 (-0.95)	-0.757 (-0.97)	-0.195 (-0.77)	-0.194 (-0.77)	0.027 (0.16)	0.032 (0.19)
<i>LNBDSIZE</i>	0.685 (0.84)	0.680 (0.83)	-0.512 (-0.52)	-0.580 (-0.59)	0.177 (0.50)	0.171 (0.49)	-0.342 (-1.45)	-0.356 (-1.51)
<i>INDRATIO</i>	0.127 (4.37)***	0.127 (4.37)***	-0.073 (-2.09)**	-0.077 (-2.20)**	0.041 (3.23)***	0.041 (3.22)***	-0.009 (-1.02)	-0.009 (-1.09)
<i>LEV</i>	-0.108 (-11.64)***	-0.108 (-11.65)***	0.095 (7.26)***	0.094 (7.18)***	-0.066 (-15.12)***	-0.066 (-15.10)***	0.029 (9.29)***	0.029 (9.39)***
<i>CAP</i>	0.342 (3.01)***	0.342 (3.00)***	-0.096 (-0.71)	-0.110 (-0.80)	0.270 (10.52)***	0.270 (10.51)***	0.020 (1.12)	0.019 (1.08)
<i>CAPLI</i>	0.005 (0.04)	0.005 (0.05)	0.104 (0.78)	0.119 (0.88)	-0.002 (-0.06)	-0.002 (-0.07)	-0.060 (-3.77)***	-0.060 (-3.78)***
<i>GR</i>	0.008 (2.42)**	0.008 (2.44)**	0.012 (3.15)***	0.012 (3.24)***	0.034 (21.48)***	0.034 (21.50)***	0.009 (8.30)***	0.009 (8.33)***
<i>ROA</i>			0.464 (4.96)***	0.472 (5.04)***			-0.327 (-35.12)***	-0.327 (-35.00)***
<i>ROALI</i>			-1.019 (-9.49)***	-1.029 (-9.56)***			0.159 (14.96)***	0.159 (14.95)***
<i>LNTA</i>	1.546 (8.20)***	1.549 (8.26)***	-0.714 (-2.97)***	-0.659 (-2.75)***	1.222 (12.27)***	1.227 (12.33)***	-0.587 (-8.56)***	-0.574 (-8.36)***
<i>LNAGE</i>	0.363 (0.75)	0.360 (0.75)	0.642 (1.11)	0.592 (1.02)	-0.622 (-3.26)***	-0.630 (-3.31)***	0.872 (6.82)***	0.848 (6.63)***
<i>SEGNUM</i>	0.268 (1.94)*	0.271 (1.97)*	-0.381 (-2.30)**	-0.343 (-2.07)**	0.020 (0.31)	0.025 (0.40)	-0.218 (-5.12)***	-0.201 (-4.74)***
行业	控制	控制	控制	控制	控制	控制	控制	控制
年份					控制	控制	控制	控制
观测值	787	787	787	787	6541	6541	6541	6541
ADJ. R ²	0.3679	0.3687	0.4418	0.4384	0.2068	0.2068	0.2180	0.2152
F 统计量	14.86***	15.35***	18.78***	19.04***	43.63***	44.71***	44.41***	44.73***

注：出于篇幅节省的考虑，公司样本自变量中的“*F_*”符号和公司-年度样本自变量中的“*FY_*”符号予以省略。常数项的回归结果列示从略。*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。括号内的数字为T统计量，***表示在1%的统计水平上显著，**表示在5%的统计水平上显著，*表示在10%的统计水平上显著。

表7 非国有控股子公司样本的回归分析

	公司样本				公司一年度样本			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	-0.015 (-0.09)	0.091 (2.52)**	-0.043 (-0.20)	0.003 (0.07)	0.013 (0.18)	0.080 (5.16)***	-0.060 (-1.38)	-0.013 (-1.35)
<i>FIRSQ</i>	0.001 (0.63)		0.001 (0.22)		0.001 (0.97)		0.001 (1.11)	
<i>DUALITY</i>	-0.894 (-0.61)	-0.875 (-0.60)	-1.575 (-0.85)	-1.562 (-0.85)	-0.002 (-0.00)	-0.006 (-0.01)	-0.192 (-0.61)	-0.195 (-0.62)
<i>LNBDSIZE</i>	5.510 (2.26)**	5.475 (2.26)**	-3.965 (-1.27)	-3.991 (-1.28)	1.813 (2.09)**	1.799 (2.07)**	-0.886 (-1.66)*	-0.896 (-1.68)*
<i>INDRATIO</i>	0.276 (3.52)***	0.281 (3.60)***	-0.094 (-0.92)	-0.092 (-0.90)	0.037 (1.19)	0.038 (1.22)	0.019 (1.00)	0.020 (1.03)
<i>LEV</i>	-0.097 (-4.03)***	-0.095 (-3.99)***	0.178 (4.80)***	0.179 (4.92)***	-0.029 (-3.29)***	-0.029 (-3.23)***	0.042 (7.05)***	0.042 (7.14)***
<i>CAP</i>	0.582 (2.42)**	0.598 (2.51)**	-0.004 (-0.01)	0.002 (0.01)	0.289 (5.73)***	0.291 (5.78)***	-0.018 (-0.58)	-0.017 (-0.54)
<i>CAPLI</i>	-0.211 (-0.89)	-0.213 (-0.90)	-0.323 (-1.08)	-0.324 (-1.09)	0.037 (0.80)	0.039 (0.85)	-0.011 (-0.38)	-0.009 (-0.32)
<i>GR</i>	0.031 (3.35)***	0.031 (3.33)***	0.001 (0.11)	0.001 (0.10)	0.033 (12.19)***	0.033 (12.18)***	0.004 (2.18)**	0.004 (2.17)**
<i>ROA</i>			-0.576 (-4.26)***	-0.577 (-4.28)***			-0.387 (-26.17)***	-0.386 (-26.15)***
<i>ROALI</i>			-0.254 (-1.43)	-0.251 (-1.42)			0.067 (3.93)***	0.068 (3.94)***
<i>LNTA</i>	2.580 (4.01)***	2.604 (4.06)***	-1.162 (-1.35)	-1.158 (-1.35)	0.689 (2.93)***	0.712 (3.04)***	-1.261 (-8.53)***	-1.246 (-8.47)***
<i>LNAGE</i>	2.702 (1.92)*	2.820 (2.02)**	-2.664 (-1.48)	-2.613 (-1.47)	-0.385 (-0.80)	-0.376 (-0.78)	-0.445 (-1.50)	-0.438 (-1.48)
<i>SEGNUM</i>	0.417 (1.01)	0.441 (1.07)	-0.065 (-0.12)	-0.055 (-0.11)	0.232 (1.61)	0.239 (1.66)*	-0.276 (-3.11)***	-0.272 (-3.06)***
行业	控制	控制	控制	控制	控制	控制	控制	控制
年份					控制	控制	控制	控制
观测值	194	194	194	194	2045	2045	2045	2045
ADJ. R ²	0.3761	0.3785	0.5520	0.5547	0.1921	0.1921	0.3474	0.3473
F 统计量	4.64***	4.79***	8.00***	8.29***	13.15***	13.46***	26.91***	27.53***

注：出于篇幅节省的考虑，公司样本自变量中的“*F_*”符号和公司一年度样本自变量中的“*FY_*”符号予以省略。常数项的回归结果列示从略。*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。括号内的数字为T统计量，***表示在1%的统计水平上显著，**表示在5%的统计水平上显著，*表示在10%的统计水平上显著。

此外，回归分析中并没有发现一致性的、其他公司治理变量（CEO兼任虚拟变量、董事会规模和独立董事比例）对公司样本和公司一年度样本经营风险的显著影响，这与西方已有的一些研究结果明显不同（如Cheng, 2008; Adams, Almeida and Ferreira, 2005）。¹³

最后，就公司特征变量来说，我们发现，无论是在公司样本还是公司一年度样本，无论是在全部样本还是国有和非国有控股样本，负债率对经营风险都存在显著的正向影响，可见，财务杠杆的使用确实会带来经营风险的明显增加；同时，我们在全部的公司及公司一年度样本、国有控股的公司及公司一年度样本以及非国有控股的公司一年度样本中，都可以观察到显著的规模与经营风险之间的负相关关系，以及多元化程度与经营风险之间的负相关关系，可见，大型上市公司的经营风险较低，而多元化也确实可以降低公司的经营风险。

值得注意的是，在表5至表7的公司样本和公司一年度样本中，盈利能力对经营风险的影响结果存在不尽一致的现象。为此，我们将本文的实证结果与Cheng (2008)的相应实证结果进行了比较，比较后发现：表5至表7的公司一年度样本中关于盈利能力对经营风险的回归方向与Cheng (2008)的相应回归结果是一致的；在表7的非国有控股的公司子样本中，关于盈利能力对经营风险的回归方向也与Cheng (2008)的相应回归结果是一致的；但是，在表5的全部公司样本中以及表6的国有控股的公司样本中，关于盈利能力对经营风险的回归方向与Cheng (2008)的相应回归结果并不一致。我们推测导致这一问题的原因可能包括：(1) 在我国的上市公司中，国有产权控股的上市公司较多，其行为方式可能与一般意义上的非国有产权控股的上市公司（包括Cheng (2008)等使用的美国上市公司样本）有所不同；(2) 更为重要的是，作为新兴市场经济国家，我国上市公司的经营业绩相对来说更不稳定，波动性较大，这导致我们在使用公司样本对盈利能力进行平均之后再进行分析的话，基于公司层面的盈利能力会丧失较多的信息含量，从而导致在其实证结果中出现与公司一年度样本实证结果不尽一致的现象发生。

五、内生性和可靠性检验

（一）内生性检验

如前所述，内生性问题是此类研究必须要解决的，以判断公司治理机制与经营风险之间的影响方向到底是从前者到后者还是从后者到前者。为此，我们剔除股权性质变更后的样本进行内生性检验。¹⁴

首先，我们使用期初的股权集中度来替换之前研究中使用的股权集中度均值或者是各年年初的股权集中度，并重复进行前面的有关回归，这可以部分地缓解可能存在的内生性问题。

同时，我们也进行了2SLS内生性检验。我们在回归分析中使用均值调整后的股权集中度及其平方，以消除股权集中度及其平方之间的高度共线性问题，并使得2SLS内生性检验容易进行。具体来说，在考察经营绩效因变量时，我们引入均值调

¹³ 事实上从另一个角度说明在中国上市公司中最主要的公司治理结构特征还是股权性质和股权结构，而其他公司治理机制（如董事会）所发挥的作用和效果其实还并不十分明显。

¹⁴ 将股权性质变更样本予以剔除的原因在于，股权性质变更本身往往会意味着公司业务的重组、经营方向的改变等等，而这会带来较大的经营风险，我们有必要将这些样本予以剔除，以观察到更为“干净”股权结构和股权性质对经营风险的影响。

整后的期初股权集中度作为回归分析中均值调整后股权集中度的工具变量；在考察经营风险时，我们引入均值调整后的期初股权集中度平方作为回归分析中均值调整后股权集中度平方的工具变量。

内生性检验的结果列示于表8。我们可以发现，表5、表6和表7中所得出的关于股权结构及股权性质与经营风险之间关系的所有主要结论在表8中都得到了有力支持。具体包括：非国有产权控股的上市公司经营风险更高、在全部样本和国有控股样本中股权集中度与经营风险之间存在着U型关系等等。此外，股权性质对经营绩效没有显著影响，股权集中度与经营绩效之间存在着显著的正相关关系，而且这种正相关关系在非国有控股的上市公司中表现得更加明显等等，这些与之前实证研究相参照的实证结果也得到了内生性检验的有力支持。

(二) 可靠性检验

我们还进行了如下的可靠性检验：

(1) 不使用winsorize样本，而使用剔除财务异常值样本对全部公司样本和公司一年度样本进行检验。¹⁵

(2) 股权集中度与股权集中度平方之间存在着高度的相关关系，为此，我们对股权集中度进行均值调整，进而使用均值调整后的股权集中度及其平方来代替之前回归中使用的股权集中度及其平方，从而消除多重共线性问题的可能影响。

(3) 在一些特殊的样本期间，公司治理环境或者财务报告环境可能会发生显著变化，而这些变化可能会影响我们所得出的关于股权性质及股权结构与经营风险之间关系的结论，为此，我们又针对2001至2006年期间的公司一年度样本以及2003至2006年期间的公司一年度样本进行了可靠性检验。¹⁶

(4) 有些公司在样本期间可能会发生股权性质和股权结构的明显改变，进而发生业务重组、经营方向变更等重大变化，为此，我们在公司样本中把这些公司予以剔除，仅使用股权性质和股权结构稳定的样本作为我们的研究对象，这会使我们所观察到的股权性质及股权结构与经营风险之间的关系更为清晰和稳定。¹⁷

(5) 在公司样本中，当期和上期ROA、当期和上期资本支出水平之间存在着高度的相关关系，为此，我们在回归分析中剔除当期ROA和当期资本支出变量，从而消除多重共线性问题。

¹⁵ 财务数据异常值的剔除标准为：股权集中度 ≤ 85 、 $-100 <$ 当年和上年ROA < 100 、负债率 < 100 、 $-100 <$ 成长性 < 800 、 $0 <$ 当年和上年资本支出水平 < 50 、样本期内ROA标准差 < 60 等。经过财务数据异常值的剔除，公司一年度样本的观察值从8586个减少到8333个，公司样本的观察值从1193个减少到1158个。

¹⁶ 在2001年以前，中国很少有上市公司聘请独立董事；2001年6月，中国证监会要求上市公司至少要聘请1/3以上独立董事，并在2003年6月之前实现该目标；2003年以后，大多数上市公司通过增选独立董事的方式，达到了这个要求；2007年1月，我国开始实施新会计准则，一个特征是允许确认公允价值损益，而在此之前是不允许确认公允价值损益的。感谢匿名审稿人指出这些制度背景方面的变化及其可能影响。

¹⁷ 所谓股权性质稳定是指该公司在样本期内的股权性质没有发生变化，一直是国有控股或者一直是非国有控股；所谓股权结构稳定是指该公司在样本期内的第一大股东持股比例与期初第一大股东持股比例之差的均值在全部公司样本二者之差均值的平均值 (-3.590838) 的正负一倍标准差 (5.883057) 之间。对于股权性质和股权结构比较稳定的样本来说，其发生行业变更、业务重组、经营方向变化的可能性较小，因此，这一可靠性检验可以在一定程度上缓解行业变化问题可能带来的影响。

表 8 内生性检验

Panel A:	使用期初股权集中度				2SLS 内生性检验			
	公司样本		公司一年度样本		公司样本		公司一年度样本	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
全部	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (2.24)**		0.001 (4.49)***		0.002 (2.27)**		0.001 (4.48)***
<i>FIRP</i>	0.022 (2.21)**	-0.123 (-2.09)**	0.018 (3.31)***	-0.083 (-4.66)***	0.025 (2.26)**	0.005 (0.35)	0.021 (3.32)***	-0.005 (-1.30)
<i>GOV</i>	0.070 (0.17)	-2.330 (-4.61)***	-0.016 (-0.07)	-0.703 (-4.54)***	0.053 (0.13)	-2.331 (-4.70)***	-0.033 (-0.14)	-0.744 (-4.83)***
观测值	981	981	6982	6982	981	981	6982	6982
ADJ. R ²	0.3298	0.4543	0.1994	0.2221	0.3558	0.4752	0.2068	0.2269
F 统计量	15.61***	23.66***	44.47***	47.36***	536.57***	886.75***	1795.51***	2047.27
Panel B:	公司样本		公司一年度样本		公司样本		公司一年度样本	
国有控股	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)	(7a)	(8a)
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (2.10)**		0.001 (3.92)***		0.002 (2.12)**		0.001 (3.82)***
<i>FIRP</i>	0.017 (1.79)*	-0.118 (-1.96)**	0.013 (2.41)**	-0.081 (-4.04)***	0.020 (1.83)*	0.001 (0.04)	0.015 (2.43)**	-0.008 (-1.85)*
观测值	787	787	5682	5682	787	787	5682	5682
ADJ. R ²	0.3659	0.4407	0.2127	0.1773	0.3941	0.4667	0.2201	0.1840
F 统计量	15.17***	18.70***	40.37***	30.15***	508.79***	687.26***	1589.36***	1275.07***
Panel C:	公司样本		公司一年度样本		公司样本		公司一年度样本	
非国有控股	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)	(7b)	(8b)
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (0.39)		0.000 (0.61)		0.001 (0.42)		0.001 (1.41)
<i>FIRP</i>	0.059 (1.73)*	-0.073 (-0.37)	0.037 (2.06)**	-0.047 (-0.94)	0.068 (1.91)*	0.017 (0.32)	0.043 (2.10)**	0.006 (0.40)
观测值	194	194	1300	1300	194	194	1300	1300
ADJ. R ²	0.3658	0.5523	0.2104	0.3805	0.4770	0.6308	0.2402	0.3980
F 统计量	4.59***	8.00***	10.11***	20.46***	173.50***	331.68***	399.48***	863.29***

注：出于篇幅节省的考虑，公司样本自变量中的“*F_*”符号和公司一年度样本自变量中的“*FY_*”符号予以省略。常数项的回归结果列示从略；其他公司治理变量、公司特征变量、行业、年份等均已控制，限于篇幅，没有报告(可根据要求提供)；*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。括号内的数字为T统计量，***表示在1%的统计水平上显著，**表示在5%的统计水平上显著，*表示在10%的统计水平上显著。

(6) 我们目前的研究样本中包含有由于公司盈余管理行为而导致的绩效波动，为此，我们有必要以出具“标准无保留意见”审计报告的公司一年度样本(共7692个)为考察对象进行可靠性检验。¹⁸

(7) 借鉴Francis, LaFond, Olsson, and Schipper (2005)对应计质量(accruals quality)的测量方法，我们还可以使用如下的经营风险衡量指标：即在所估计的公司一年度样本的残差基础上，并不是将其绝对值作为公司一年度经营风险的衡量指标，而是使用该公司之前连续四年(含当年)残差的标准差作为其公司一年度经营风险的衡量指标(记为 FY_SDRE)。¹⁹由于这样做要求在测算公司一年度经营风险时要有连续四年的观察值，所以我们的研究样本会有所减少(减少到4695个)。最后，我们又以这4695个研究样本及测算出来的新的公司一年度经营风险衡量指标为基础进行了可靠性检验。

在上述七项可靠性检验中，研究结论没有发生明显变化，具体的可靠性检验结果请参见表9。

六、研究结论

本文考察了中国上市公司控股股东性质和股权集中度对经营风险的影响。我们发现，非国有产权控股上市公司的经营风险要明显地高于国有产权控股的上市公司，这可能与非国有产权控股的上市公司经理人员的决策权力更大、经理人员的堑壕效应程度更小以及这些公司面临的经营环境不确定性程度更高有关；另一方面，我们发现，股权集中度和经营风险之间存在着非线性的U型关系，而且这种关系主要是在国有控股的上市公司中存在，这可能与国有控股上市公司中股权集中度过高时政府的决策效应更加明显，而股权集中度过低时CEO的决策效应更加明显有关。此外，我们还发现，负债率对经营风险存在显著的正向影响，规模与经营风险之间存在着显著的负相关关系，多元化程度也与经营风险之间存在着显著的负相关关系。

同时，与之前徐莉萍、辛宇、陈工孟(2006a、2006b)的研究相类似，我们发现股权集中度与经营绩效之间存在着显著正相关关系，而且这种正相关关系在非国有控股的上市公司中表现得更加显著，而股权性质对经营绩效的影响并不明显。表10概括了本研究的基本结论。

本文的学术贡献主要表现在：(1)对公司经营风险的深入研究可以使我们更准确、全面地把握公司治理的决策过程和经济后果；(2)开始尝试将代理理论和集体决策理论整合在一起以更好地解释所发现的经验现象。

¹⁸ 感谢匿名审稿人指出这一考察方向。需要指出的是，由表9的第(6)部分我们可以看到，与其他实证结果不同的是，股权性质对ROA存在着显著的负向影响，而在其他所有的研究中，股权性质对ROA的影响并不显著。进一步的分析可以发现，导致这一实证结果的原因在于：在我们所剔除的被出具非标准审计意见的公司一年度样本(共894个观测值)中，非国有控股的上市公司的ROA(309个观测值，其均值和中位数分别为-6.845%和-2.772%)要明显地差于国有控股的上市公司的ROA(585个观测值，其均值和中位数分别为-4.419%和0.282%)，二者在1%的统计水平上存在着明显差异。这样，由于相对来说更多的ROA表现比较差的非国有控股上市公司被剔除出研究样本，结果导致在剩下的标准无保留审计意见样本中，非国有控股上市公司的ROA表现更好，好于国有控股上市公司的ROA。由于本文侧重于对经营风险的研究，所以我们把对这一问题的深入探讨留在今后的研究中再加以进行。

¹⁹ 感谢匿名审稿人提出这一重要的经营风险衡量指标。

表9 可靠性检验

	(1) 剔除财务异常值样本				(2) 对股权集中度进行均值调整			
	全部公司样本		全部公司一年度样本		公司样本		公司一年度样本	
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.031 (3.05)***	-0.099 (-2.26)**	0.038 (6.62)***	-0.081 (-4.59)***	0.033 (3.33)***	0.009 (0.73)	0.041 (7.85)***	-0.003 (-0.98)
<i>FIRSQ</i>		0.001 (2.29)**		0.001 (4.60)***		0.002 (2.49)***		0.001 (5.45)***
<i>GOV</i>	0.312 (0.78)	-1.633 (-4.49)***	-0.056 (-0.25)	-0.842 (-5.74)***	0.031 (0.08)	-2.287 (-4.71)***	-0.223 (-1.11)	-0.648 (-4.93)***
观测值	1158	1158	8333	8333	1193	1193	8586	8586
ADJ. R ²	0.3115	0.4283	0.1734	0.3074	0.3503	0.5169	0.1932	0.2584
F 统计量	16.86***	25.07***	44.69***	87.01***	20.48***	36.42***	52.38***	70.56***
	(3) 特殊样本期间回归结果				(4) 股权性质和股权结构稳定样本		(5) 剔除当期ROA和CAP均值	
	2001-2006 公司一年度		2003-2006 公司一年度		公司样本		公司样本	
	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>
<i>FIRP</i>	0.039 (6.62)***	-0.097 (-5.24)***	0.038 (5.16)***	-0.108 (-4.57)***	0.039 (3.42)***	-0.147 (-2.08)**	0.034 (3.35)***	-0.140 (-2.27)**
<i>FIRSQ</i>		0.001 (5.26)***		0.001 (4.63)***		0.002 (2.31)**		0.002 (2.53)**
<i>GOV</i>	0.224 (0.98)	-0.614 (-4.27)***	0.407 (1.49)	-0.698 (-4.01)***	0.092 (0.21)	-2.124 (-3.86)***	0.025 (0.06)	-2.265 (-4.67)***
观测值	6649	6649	4620	4620	837	837	1193	1193
ADJ. R ²	0.2076	0.3173	0.2253	0.2990	0.3680	0.4495	0.3422	0.5170
F 统计量	46.84***	76.36***	38.32***	51.52***	15.75***	19.96***	20.38***	38.52***
	(6) 使用标准无保留审计意见样本		(7) 使用 Francis <i>et al.</i> (2005) 的方法计算经营风险					
	公司一年度样本		公司一年度样本					
	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_ROA</i>	<i>FY_SDRS</i>		
<i>FIRP</i>	0.027 (6.25)***		-0.061 (-4.17)***		0.045 (5.76)***	-0.062 (-3.79)***		
<i>FIRSQ</i>			0.001 (3.91)***			0.001 (4.44)***		
<i>GOV</i>	-0.825 (-4.94)***		-0.333 (-2.83)***		-0.201 (-0.72)	-0.416 (-3.38)***		
观测值	7692		7692		4695	4695		
ADJ. R ²	0.1670		0.0793		0.2013	0.4071		
F 统计量	39.55***		16.41***		32.97***	81.59***		

注：出于篇幅节省的考虑，公司样本自变量中的“*F_*”符号和公司一年度样本自变量中的“*FY_*”符号予以省略。常数项的回归结果列示从略；其他公司治理变量、公司特征变量、行业、年份等均已控制，限于篇幅，没有报告（可根据要求提供）。*F_SDROA*是样本期间各家公司年度总资产报酬率的标准差。其它变量定义见表1。括号内的数字为T统计量，***表示在1%的统计水平上显著，**表示在5%的统计水平上显著，*表示在10%的统计水平上显著。

表 10 本研究基本结论

		基于公司样本		基于公司一年度样本	
		经营绩效	经营风险	经营绩效	经营风险
		ROA	ARO A	ROA	SDROA
全部样本	股权集中度	+ sig	U 型	+ sig	U 型
	股权性质	not sig	- sig	not sig	- sig
国有企业样本	股权集中度	+ sig	U 型	+ sig	U 型
民营企业样本	股权集中度	+ sig	not sig	+ sig	not sig

根据本文的实证结果，我们可以得出如下政策建议：(1)在国有企业中，如果要降低公司的经营风险水平的话，在股权结构方面，最好是形成相互制衡又相对集中的股权结构，此时的权力结构所带来的妥协和充分交流会使得经营风险最低，而高度集中的股权结构会使决策权力向控股股东（即政府）过分集中、高度分散的股权结构会使决策权力向CEO过分集中，这两种比较极端的股权结构均会导致国有控股上市公司的经营风险水平偏高；(2)不同控股股东股权性质的不同会带来其所有权行使方式的不同，而这种行使方式的不同不仅会造成公司经营绩效的差异（如徐莉萍、辛宇、陈工孟，2006a、2006b等），也会带来公司经营风险水平的差异，因此，我们在评价产权性质的经济后果时，也需要考虑经营风险这一维度；(3)公司自身特征（如财务杠杆、规模、多元化程度等）的差异也会带来其经营风险的不同，因此，投资者在判断上市公司的风险水平时，要着眼于以上公司特征，以做出正确的投资决策。

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Ownership Structure and Corporate Operating Risk*

Liping Xu and Yu Xin¹

Abstract:

Using group decision-making theory and agency theory, we examine the relationship between ownership structure (type of controlling shareholder and ownership concentration) and operating risk in China's listed companies. First we find that operating risk in state-controlled firms is significantly lower than in non-state-controlled firms. The latter have higher risk because managers have more decision-making power and are less apt to become entrenched, and these firms face a more uncertain operating environment. Second, a non-linear, U-shaped relation exists between ownership concentration and operating risk, where firms with a highly concentrated or highly diversified ownership structure have greater operating risk, whereas a moderately concentrated structure with checks and balances from outside blockholders leads to lower operating risk. Third, we find that the non-linear, U-shaped relation between ownership concentration and operating risk exists only in state-controlled firms. Finally, size and diversification are significantly and negatively related to operating risk, while leverage is significantly and positively related to the same.

Keywords: Type of Controlling Shareholder, Ownership Concentration, Operating Risk, Group Decision-Making Theory, Agency Theory

CLC Codes: F272.3, F275.5, F270.3

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I. Introduction

A large array of literature investigates the relation between corporate governance and firm performance. Among such studies, those focusing on the ownership structure of China's listed companies include Chen and Jiang (2000), Chen and Xu (2001), Yu (2001), Du and Liu (2002), Chen, Chen, and Zhu (2004), Xia and Fang (2005), and Xu, Xin, and Chen (2006a, 2006b). These studies analyse the impacts of the type of controlling shareholder, ownership concentration, and the check-and-balance of ownership on firm operating performance or market performance. Although firm performance has two dimensions – performance level and performance variability – the above literature relates mainly to the former while largely ignoring the latter.²

Performance variability reflects firm risk, which is a core issue in corporate finance. Exploring the relation between corporate governance and firm risk contributes to better understanding of the impact of corporate governance on micro-economic consequences and corporate decision-making processes. Although previous literature on corporate governance and firm performance finds that better overall corporate governance is related to better firm performance (e.g. Gompers, Ishii, and Metrick, 2003), this does not explain why value-decreasing or performance-reducing corporate governance mechanisms still have a market. For example, studies find that board size and firm performance are negatively related because of agency problems and cooperative/communication problems (Yermack, 1996; Eisenberg, Sundgren, and Wells, 1998). But Cheng (2008) finds that it takes more compromises for larger boards to reach consensus, and consequently their decisions are less extreme. In other words, larger boards can reduce firm risk. Therefore, in evaluating the effect of larger boards, both corporate performance and operating risk should be considered. A risk-and-return trade-off may exist between lower operating risk and lower performance under a larger board; otherwise, we cannot explain the existence of larger boards in practice, which is considered a value-decreasing mechanism.

A study on corporate governance and firm risk also contributes to better understanding of risk management. Since the global financial crisis, risk management has become a worldwide concern. Managers, investors, regulators, rating institutions, stock exchanges, and other stakeholders need to be aware of risk factors and understand how to position firms in a reasonable place for taking risks. Risk-taking is necessary for creating firm value, but excess risk-taking typically goes hand in hand with higher risks and higher business failure rates. A good strategy is to strike a balance between risk and return.

² Similar to performance level, performance variability is also a comprehensive measure that is the ultimate result of various risks, including operating risk, financial risk, market risk, and policy risk. According to corporate finance textbooks, operating risk and financial risk constitute total risk. In this paper, we sometimes refer to performance variability as corporate risk, whose definition is similar to the concept of total risk. In our empirical analysis, the dependent variable also resembles total risk. Since we control for leverage, our analysis in fact focuses on the relation between ownership structure and operating risk. Therefore, we emphasise operating risk in our theoretical analysis.

Consequently, research on corporate governance and firm risk has recently attracted increasing attention.³ Our study extends this line of literature by considering the special corporate governance mechanisms in emerging China. The two most important features of corporate governance in China's listed companies are state ownership and highly concentrated ownership, both of which influence firm risks. Although the existing literature has much discussion on ownership structure and performance level, the relation between structure and performance variability in China's listed companies remains unknown. This study fills this void.

As per a sample of China's listed companies between 2000 and 2007, we first find that listed companies controlled by the state have lower operating risk compared with those controlled by non-state investors. This is because managers in state-controlled listed companies enjoy less decision-making power but a larger entrenchment effect, and such companies face less uncertain operating environments. Second, although we find a non-linear, U-shaped relation between ownership concentration and corporate operating risk, this holds only for state-controlled listed companies. Such a U-shaped relation might result from the fact that state owners enjoy more decision-making power when ownership concentration is high, whereas chief executive officers (CEOs) enjoy more such power when concentration is low. Finally, leverage is positively related to operating risk, while firm size and diversification are negatively related. In addition, consistent with Xu, Xin, and Chen (2006a, 2006b), we find that the effect of ownership type on performance levels is not entirely obvious. Although ownership concentration is positively associated with operating performance, this relation is more obvious in non-state-controlled listed companies.

The remainder of the paper is organised as follows: Section II reviews the literature, Section III proposes the hypotheses, Section IV introduces the research design and reports the basic empirical results, Section V investigates the endogeneity problem and the robustness of the results, and Section VI concludes the paper.

II. Literature Review

Recently, a growing literature has started to investigate the relation between corporate governance and risk. For example, Clayton, Hartzell, and Rosenberg (2003) find significant, long-lasting increases in stock price volatility following CEO turnover. These increases are larger after forced departures and after outside successions following voluntary departures. These results are consistent with more informative signals of value driving the increased volatility, helping resolve two sources of uncertainty: possible changes in the firm's strategy, and doubt about the successor CEO's ability.

³ Please refer to Section II for a review of recent literature.

Adams, Almeida, and Ferreira (2005) investigate the decision-making power of CEOs and its impact on corporate performance. They find that stock prices are more variable for firms run by powerful CEOs. The decision-making of a less powerful CEO must be reviewed or approved by other managers or the board, and this collective mechanism results in less extreme decisions. But the likelihood of either very good or very bad decisions is higher in an organisation in which the CEO's power to influence decisions is greater than in one in which many executives are involved in making decisions. Cheng (2008) provides empirical evidence that firms with larger boards have lower variability in corporate performance. He finds that board size is negatively associated with the variability of monthly stock returns, annual accounting return on assets, Tobin's Q, accounting accruals, extraordinary items, analyst forecast inaccuracy, R&D spending, and the frequency of acquisition and restructuring activities. These results are consistent with the view that it takes more compromises for larger boards to reach consensus, and consequently their decisions are less extreme, leading to less variable corporate performance.

Bebchuk, Cremers, and Peyer (2007) investigate the relation between CEO centrality – the relative importance of the CEO within the top executive team in ability, contribution, or power – and the value and behaviour of public firms. Using the fraction of the top five compensated CEOs, they find that greater CEO centrality is correlated with lower firm-specific variability of stock returns over time, a result that might stem from the tendency and the power of the CEO to play it safe and avoid firm-specific volatility.

John, Litov, and Yeung (2008) find that better investor protection could lead corporations to undertake riskier but value-enhancing investments. Lower protection allows insiders with relatively low levels of cash flow rights to siphon off more corporate resources for private benefit. The greater the corporate resources they expect to divert, the more the insiders will avoid taking risky investments to protect their private benefits. In addition, undiversified ownership held by entrenched owners might direct the companies they control to undertake less risky investments in order to reduce their exposure. Further, in better investor protection environments, non-equity stakeholders are less effective in reducing corporate risk taking for their self-interest. Some indirect evidence also supports this argument. For example, Amihud and Lev (1981) show that powerful managers have an incentive to engage in risk-reduction activities such as diversifying conglomerate mergers. Similarly, Bertrand and Mullainathan (2003) document that managers protected by anti-takeover laws engage in less destruction of old plants and less creation of new plants.

The above literature emphasises the impact of corporate governance on risk. In fact, risks can affect corporate governance. One source of risk is the uncertainty of the corporate operating environment. Demsetz and Lehn (1985) point out that the potential of exercising a given degree of owner control is correlated with instability in the firm's

environment. In less predictable environments, manager behaviour becomes more difficult to monitor, and the greater the payoff will be to owners who maintain tighter control. The authors' empirical results show a reversed U-shape between the variability of firm performance and ownership concentration. Linck, Netter, and Yang (2008) document evidence that board structure develops as an efficient response to a firm's contracting environment. Harris and Raviv (2008) argue that board size should be positively related to the private benefits of managers and negatively related to monitoring costs. Boone, Field, Karpoff, and Raheja (2007) find that both board size and the proportion of outside directors are related positively to managers' private benefits and negatively to monitoring costs. The variability of corporate performance reflects to some extent the cost of monitoring.

To summarise the above studies on corporate governance and risk, we make the following observations. On the one hand, theories that explain corporate governance and risk are not limited to agency theory. For example, Adams, Almeida, and Ferreira (2005) and Cheng (2008) apply group decision-making and sociology theories; to understand firm-level risks, it is important to uncover the decision-making process. Moscovici and Zavalloni (1969) argue that the final choice made by a group represents an averaging compromise among individual positions. Sah and Stiglitz (1986, 1991) suggest that group decision-making naturally gives rise to diversified opinions and that a group's final decision is a compromise reflecting the different opinions. Sah (1991) conjectures that more centralised societies should have more volatile economic performance than less centralised ones. The empirical evidence of Almeida and Ferreira (2002) is consistent with this projection that both the best and the worst performers in growth rates are more likely to be autocracies. Therefore, sociology and psychology also explain the impact of corporate governance on the results of decision-making. On the other hand, there are also findings arguing that corporate governance affects firm risks, and that firm risks influence corporate governance mechanisms. Therefore, checks for reverse causality are necessary in such studies.

III. Hypothesis Development

The typical feature of China's listed companies is the special ownership structure, that is, the dominance of state ownership and the high ownership concentration. We investigate the influence of this structure on corporate operating risk and discuss this relation from the perspectives of group decision-making theory and agency theory. We also consider the effect of uncertainty in the operating environment.

1. Type of ownership and operating risk

According to group decision-making theory, when the relative decision-making power of a CEO is higher, the CEO will be more likely to make extreme decisions, and

corporate operations will be riskier (Adams, Almeida, and Ferreira, 2005). In non-state-controlled listed companies, the CEO typically comes from the controlling shareholder or someone that the shareholder trusts. The controlling shareholder and CEO are thus likely to be closely related or be persons acting in concert. In this case, the CEO has more authority from the controlling shareholder and therefore more decision-making power. In state-controlled listed companies, on the other hand, two factors determine the power of the CEO: monitoring from government departments and the absence of real owners. In these companies, the CEO's decision-making is subject to monitoring and constraints from government departments and the public. In making decisions, the CEO must consider not only the economic results but also political and social influences. This in turn weakens the CEO's decision-making power. But at the same time, agency problems are more serious because of the absence of real owners, thereby giving the CEO excessive power. In reality, both excessive power and insufficient power can be found in state-controlled firms, and so the distribution of CEO power in these firms tends to be wide. But on average decision-making power lies at the intermediate level. To summarise, group decision-making theory suggests that CEOs in non-state-controlled listed companies usually have relatively higher power, therefore resulting in bigger operating risks.

In contrast, agency theory suggests that when a firm is controlled by over-protected insiders, these insiders will make sub-optimal, conservative investment decisions to protect their private benefits (John, Litov, and Yeung, 2008). Therefore, more entrenched management will make investment decisions that result in less variable firm performance. In state-controlled listed companies, the compensation mechanism is not complete, and so CEOs enjoy luxury consumption and gray, non-monetary revenues, and they are also more entrenched; also, the absence of a real owner gives these managers more opportunity to entrench themselves. In non-state-controlled listed companies, on the other hand, CEOs are better motivated and less entrenched.⁴ Therefore, CEOs in state-controlled listed companies especially prefer job security and risk avoidance, which results in less corporate risk-taking.

Finally, when the firm's operating environment is more uncertain, firm performance will vary more and the firm's operations will be riskier. The state-owned enterprise (SOE) reform in China since the 1990s has taken the strategy of privatising the SOEs in competitive industries, while maintaining state control in strategically important industries, such as natural resources, banking, telecommunications, and the like. As a result, non-state-controlled firms are positioned in competitive, more volatile industries, while state-controlled firms are doing business in less competitive, stable industries. In

⁴ Once they lose their positions, managers in state-controlled listed companies will also lose their various job consumptions. In addition, it is hard for them to find a comparable job since they are not recruited from the manager's market. The compensation package of managers in non-state-controlled companies is different. For them, the monetary salary, which is related to firm performance, is more important. These managers can also find another job more easily.

addition, the latter are more likely to obtain government support in the face of operating difficulties. Therefore, non-state-controlled firms will have higher operating risks because of greater product market competition and less government support.

To summarise the above analysis, we propose the following hypothesis:

H1: The operating risks of non-state-controlled listed firms will be higher than those in state-controlled listed firms.

2. Ownership concentration and operating risks

We separately analyze the relation between ownership concentration and operating risk for state-controlled and non-state-controlled listed firms, since they differ in how shareholders exercise their rights.

In a state-controlled firm, the more concentrated the ownership, the more influence the government has over the firm. Stricter and more effective monitoring from the government results in a less powerful CEO and less operating risk. But it is also possible that higher ownership concentration will be related to higher operating risk. First, more effective monitoring from the government reduces entrenchment, and so CEOs in such firms are more likely to assume risks to improve firm value. Second, state-owned assets have been fully diversified in a set of firms controlled by the state. Therefore, the state, as the owner of these firms, has no incentive to avoid risk. We thus expect that the overall effect will be a positive relationship between ownership concentration and operating risk.

On the other hand, if ownership is highly dispersed in such a firm, the problem of the absence of a real owner will be more serious, and the CEO will be more powerful. The cumulative effect, therefore, is determined by whether the entrenchment effect or the decision-making effect dominates the other. If the former dominates, operating risk will be lower; if the latter, operating risk will be higher. The real result, however, is an empirical question.⁵

At the same time, lower state ownership gives rise to possible competition for corporate control, leading to greater instability in the operating environment and higher operating risk. But higher state ownership can avoid such competition (Zhu and Wang, 2004).

To integrate the decision-making effect, entrenchment effect, and the effect of an unstable operating environment, we propose the following hypothesis:

H2: In state-controlled listed companies, the relation between ownership concentration and operating risk will be U-shaped; that is, both high and low ownership concentration will be related to high operating risk.

⁵ As per our empirical results, the decision-making effect dominates. That is, lower ownership concentration in state-controlled companies results in higher operating risk.

In non-state-controlled firms, the controlling shareholder is a real owner and has real exercise power. According to the decision-making argument, as ownership increases, so too does the owner's decision-making power, and this power is less restricted. Therefore, the decisions made are more likely to be extremely good or extremely bad, and operating risk is higher. On the other hand, as ownership increases, the private benefits of control also increase, and investment becomes increasingly related to the controlling shareholder's interest. According to the entrenchment argument, such shareholders have more inclination to avoid risk. Thus, the summary effect is determined by whether the decision-making effect or the entrenchment effect dominates. In addition, dispersed ownership results in competition for corporate control and instability in the corporate operating environment. In non-state-controlled listed companies, ownership concentration is typically lower than in state-controlled companies, and so the relation between concentration and firm risk in these firms is also an empirical question.⁶

Since about three quarters of our sample firms are controlled by the state, we expect that the result from the entire sample regression will be similar to that of the state-controlled sample.

IV. Research Design and Empirical Results

1. Empirical models

We investigate corporate risk in two dimensions. One is the within-firm, over-time variability of corporate operating performance, where variability is measured on a firm basis; the other is the across-firm variability of corporate operating performance, where variability is measured on a firm-year basis.

As in Almeida, and Ferreira (2005) and Cheng (2008), we construct the following model:

$$F_SDROA = c + \alpha_1 F_FIRP + \alpha_2 F_FIRSQ + \alpha_3 F_GOV + \sum \beta_i F_OTHERCG_i + \sum \gamma_i F_FC_i + \sum \lambda_i F_IND_i + \varepsilon, \quad (1)$$

where $F_$ indicates firm level observations. F_SDROA is the standard deviation of a firm's annual ROA during the sample period and measures corporate operating risk. The bigger the F_SDROA , the higher the operating risk. F_FIRP is the mean of ownership by the largest shareholder as at the end of the year during the sample period and measures ownership concentration. F_FIRSQ is the square of mean ownership to test for any possible nonlinear relation between ownership concentration and firm risk. F_GOV is the mean of the state control dummy (1 for state control, 0 for non-state control) during

⁶ As reported in Section IV, we fail to observe any significant relation between ownership concentration and corporate risk in non-state-controlled listed companies.

the sample period.⁷ In addition, we control for other corporate governance variables, corporate financial and organisational characteristics, and industry fixed effects. $F_OTHERCG$ is the mean value of other corporate governance variables, including a dummy for Chairman-CEO duality, the natural log of board size, and the ratio of independent directors. F_FC is the mean of a series of firm characteristics, including leverage, current and lagged capital expenditure, growth on sales, current and lagged ROA, natural log of total assets, natural log of listing age, and diversification (number of segments). F_IND is industry fixed effects.

We adopt Glejser's heteroskedasticity test (Glejser, 1969) to estimate cross-firm operating variability. In particular, we first estimate a predictive model of firm performance. We then take the absolute value of residuals from this model as the measure of firm risk. This model is as follows:

$$\begin{aligned}
 FY_ROA = & c + \alpha_1 FY_FIRP + \alpha_2 FY_FIRSQ + \alpha_3 FY_GOV \\
 & + \sum \beta_i FY_OTHERCG_i + \sum \gamma_i FY_FC_i + \sum \lambda_i FY_IND_i \\
 & + \sum \theta_i FY_YR_i + \varepsilon ,
 \end{aligned} \tag{2}$$

where $FY_$ indicates firm-year level observations. FY_ROA is a firm's ROA for each firm-year. FY_FIRP is ownership by the largest shareholder as at the beginning of the year. FY_FIRSQ is the square of FY_FIRP .⁸ FY_GOV is a dummy variable for the type of controlling shareholder, coded 1 if the shareholder is a state entity, and 0 otherwise. FY_OTHERC is other corporate governance variables for each firm-year, including a dummy for Chairman-CEO duality, the natural log of board size, and the ratio of independent directors. FY_FC is a series of firm characteristics for each firm-year, including leverage, current and lagged capital expenditure, growth on sales, natural log of total assets, natural log of listing age, and diversification (number of segments). F_IND is industry fixed effects, and FY_YR is year fixed effects.⁹

We calculate our firm-year measure of corporate risk, FY_AROA , as the absolute value of the residual from the predictive model (model (2)). We then regress FY_AROA on all independent variables in model (2) and the current and lagged ROA to examine how ownership structure influences it.

Table 1 lists the definitions of the main variables on firm-year level.¹⁰

⁷ Obviously, if a firm is state-controlled across years during the sample period, F_GOV equals 1. If a firm is non-state-controlled across the sample period, F_GOV equals 0. If F_GOV lies between 0 and 1, this indicates that control changes hands between the state and non-state shareholders.

⁸ If the coefficient on the square term is not significant, we delete that term in the predictive model.

⁹ Year fixed effects control the effect of the country's macroeconomic environment.

¹⁰ The firm level variables are simply the mean values of firm-year observations for each firm during the sample period, except for F_SDROA , which takes the standard deviation instead.

Table 1 Variable Definitions

	Variable	Definition
Dependent variables	<i>FY_AROA</i>	The absolute value of residuals from the forecasting model (Model (2)).
Ownership structure	<i>FY_FIRP</i>	Ownership concentration, measured as ownership by the largest shareholder at the beginning of the year (per cent).
	<i>FY_FIRSQ</i>	The square of ownership concentration, measured as the square of the ownership by the largest shareholder at the beginning of the year (per cent).
	<i>FY_GOV</i>	Type of largest shareholder at the beginning of the year, coded 1 for state-controlled firms, and 0 for non-state-controlled firms.
Other corporate governance variables	<i>FY_DUALITY</i>	Dummy variable for chair-CEO duality at the beginning of the year, coded 1 if the CEO is also the chairman of the board, and 0 otherwise.
	<i>FY_LNBDSIZE</i>	Board size at the beginning of the year, measured as the natural log of the number of directors on the board.
	<i>FY_INDRATIO</i>	Board structure at the beginning of the year, measured as the ratio of independent directors (number of independent directors/board size, per cent)
Firm characteristics variables	<i>FY_LEV</i>	Leverage at the beginning of the year, measured as the ratio of total liability to total assets (per cent).
	<i>FY_CAP</i>	Current year capital expenditure, measured as the ratio of capital expenditure to depreciation and amortisation.
	<i>FY_CAPL1</i>	Lagged capital expenditure.
	<i>FY_GR</i>	Growth rate, measured as the ratio of current year sales increases to prior year sales (per cent).
	<i>FY_ROA</i>	Operating performance, measured as current year return on assets, which is the ratio of earnings before interest and taxes (EBIT) to average total assets (per cent).
	<i>FY_ROAL1</i>	Lagged ROA (per cent).

	Variable	Definition
	<i>FY_LNTA</i>	Firm size at the beginning of the year, measured as the natural log of total assets in renminbi.
	<i>FY_LNAGE</i>	Listing age, measured as the natural log of number of years listed.
	<i>FY_SEGNUM</i>	Diversification, measured as the number of segments for the current year.
Industry dummy	<i>FY_IND</i>	Industry dummy, where the classification of industries are based on CSRC methods, with the manufacturing industry defined by two digits.
Year dummy	<i>FY_YR</i>	Dummy variable for years.

Note: The table reports variable definitions on a firm-year basis. Corporate governance data are both extracted from CSMR and hand-collected. Firm characteristics and industry data are extracted from the Wind Database.

2. Sample and descriptive statistics

We draw our sample from companies listed on the main boards of the Shanghai and Shenzhen Stock Exchanges during 2000–2007. The original sample is 9907 firm-years, of which 8586 remain after deleting firm-years with missing key variables. To alleviate the influence of outliers, we winsorise all continuous variables – that is, ownership concentration, its square, ratio of independent directors, leverage, current and lagged capital expenditure, growth on sales, current and lagged ROA, and natural log of total assets – at the 1 and 99 percentiles.

To obtain the firm-level sample, we require a firm to have no missing values for at least two successive years, which results in 1193 firm-level observations. Again, we winsorise all continuous variables – that is, the standard deviation of ROA, mean ownership concentration, its square, mean ratio of independent directors, mean leverage, mean value of current and lagged capital expenditure, mean growth on sales, mean current and lagged ROA, and mean value of the natural log of total assets – at the 1 and 99 percentiles.

Table 2 reports the descriptive statistics for the main variables, with panel A reporting the firm sample and panel B the firm-year sample. For the firm sample, the standard deviation of ROA lies between 0.34 and 56.73 per cent, with a mean and median of 5.79 and 3.25 per cent, respectively. Average ownership by the largest shareholder lies between 12.52 and 74.89 per cent, with a mean and median of 42.51 and 41.72 per cent, respectively. For the firm-year sample, the absolute residual from the predictive model lies in the range between 0.0002 per cent (approximate 0.00) and 40.28 per cent, with a mean and median of 4.60 and 3.00 per cent, respectively. Ownership by the largest

shareholder runs between 11.03 and 75 per cent, with a mean and median of 42.42 per cent and 41.34 per cent, respectively. Overall, three quarters of sample firms are state-controlled while the remaining quarter is not.

Table 3 reports the correlation analysis between the main variables, with panel A reporting the firm sample correlations and panel B those of the firm-year sample. The upper triangle reports the Spearman correlations and the lower triangle the Pearson correlations. The results in this table show no serious multicollinearity problem among the variables. But ownership concentration and its square are highly correlated. Also, in the firm sample, the correlation coefficients between current and lagged capital expenditure and between current and lagged ROA are extremely high. Yet our robustness tests in Section V show that these high correlations do not change our results.¹¹

Additionally, in the firm sample operating risk is negatively related to ownership concentration, its square, state control, board size, ratio of independent directors, current and lagged capital expenditure, current and lagged ROA, and firm size, and positively related to leverage, growth, and listing age. For the firm-year sample, operating risk is negatively related to ownership concentration, its square, state control, board size, current and lagged capital expenditure, firm growth, current and lagged ROA, firm size, and diversification, and positively related to the ratio of independent directors, leverage, and listing age. But we rely more on the regression analysis, which provides a more complete picture of the relations among the variables.

3. Comparison analysis

We next compare the level of operating risks between firms controlled by state and non-state shareholders. Table 4 reports the results.

According to the type of largest shareholder and its changing status during the sample period, we group the firm sample into three main sub-samples: firms controlled by the state across the years from 2000 to 2007 (GROUP 1, 787 obs.), firms controlled by non-state entities across the years from 2000 to 2007 (GROUP 2, 194 obs.), and firms beginning with state control but ending with non-state control (GROUP 3, 185 obs.).¹² In Table 4 Panel A, we report firm performance variability for the above three groups and compare their means and medians. The results show that the operating risks for firms controlled by non-state shareholders (GROUP 2) and for those beginning with state control and ending with non-state control (GROUP 3) are significantly higher than those for firms controlled by state shareholders (GROUP 1). At the same time, firms that experience control transfers from state to non-state shareholders have even more volatile performance; therefore, control transfers increase firm risk.

¹¹ In robustness tests, we use the mean-adjusted ownership concentration and the mean-adjusted square of ownership concentration to eliminate the high correlation between them. In another test, we exclude current capital expenditure and current ROA in the firm sample. Our regression results are essentially unchanged in both checks. For details, please refer to Section V.

¹² Note three more situations: firms that begin with non-state control but end with state control (13 obs.); firms the begin and end with state control but experience a control transfer to non-state shareholders in the between years (11 obs.); and firms that begin and end with non-state control but experience a control transfer to state shareholders in the between years (3 obs.). But since the sample sizes are too small, we exclude them from comparison analysis.

Table 2 Descriptive Statistics

Panel A: Firm sample (1193 Obs.)					
	Mean	Median	SD	Minimum	Maximum
<i>F_SDROA</i>	5.79	3.25	8.14	0.34	56.73
<i>F_FIRP</i>	42.51	41.72	15.55	12.52	74.89
<i>F_FIRSQ</i>	2049.11	1740.23	1368.17	156.69	5608.51
<i>F_GOV</i>	0.75	1.00	0.39	0.00	1.00
<i>F_DUALITY</i>	0.13	0.00	0.25	0.00	1.00
<i>F_LNBDSIZE</i>	2.25	2.22	0.19	1.53	2.92
<i>F_BDSIZE</i>	9.65	9.25	1.87	4.60	18.50
<i>F_INDRATIO</i>	23.59	22.39	6.43	10.31	40.74
<i>F_LEV</i>	48.15	46.85	18.34	12.34	126.49
<i>F_CAP</i>	3.11	2.42	2.63	0.23	17.59
<i>F_CAPLI</i>	3.39	2.67	2.71	0.24	15.43
<i>F_GR</i>	33.10	21.51	59.18	-15.46	469.03
<i>F_ROA</i>	4.46	4.75	5.69	-19.78	17.84
<i>F_ROALI</i>	4.67	5.10	5.42	-18.40	16.80
<i>F_LNTA</i>	21.15	21.05	0.86	19.28	23.79
<i>F_TA</i>	2.97×10^9	1.39×10^9	1.30×10^{10}	1.28×10^8	3.95×10^{11}
<i>F_LNAGE</i>	1.87	1.95	0.41	0.92	2.71
<i>F_AGE</i>	7.02	7.00	2.75	2.50	15.00
<i>F_SEGNUM</i>	2.25	2.00	1.14	1.00	5.00
Panel B: Firm-year sample (8586 Obs.)					
	Mean	Median	SD	Minimum	Maximum
<i>FY_AROA</i>	4.60	3.00	5.36	0.00	40.28
<i>FY_FIRP</i>	42.42	41.34	16.81	11.03	75.00
<i>FY_FIRSQ</i>	2081.83	1708.87	1490.68	121.66	5625.00
<i>FY_GOV</i>	0.76	1.00	0.43	0.00	1.00
<i>FY_DUALITY</i>	0.13	0.00	0.34	0.00	1.00
<i>FY_LNBDSIZE</i>	2.23	2.20	0.24	0.00	2.94
<i>FY_BDSIZE</i>	9.59	9.00	2.31	1.00	19.00
<i>FY_INDRATIO</i>	22.50	30.77	15.50	0.00	45.45
<i>FY_LEV</i>	48.33	47.58	21.20	8.22	138.49
<i>FY_CAP</i>	2.86	1.66	3.71	0.01	22.71
<i>FY_CAPLI</i>	3.09	1.76	4.08	0.01	24.91
<i>FY_GR</i>	24.35	15.36	57.07	-72.43	377.02
<i>FY_ROA</i>	4.47	5.02	7.88	-33.14	23.93
<i>FY_ROALI</i>	4.73	5.33	7.29	-28.74	22.29
<i>FY_LNTA</i>	21.10	21.01	0.92	19.06	23.82
<i>FY_TA</i>	2.81×10^9	1.34×10^9	1.06×10^{10}	3.07×10^6	4.60×10^{11}
<i>FY_LNAGE</i>	1.89	1.95	0.53	0.00	2.89
<i>FY_AGE</i>	7.45	7.00	3.36	1.00	18.00
<i>FY_SEGNUM</i>	2.28	2.00	1.41	1.00	5.00

Note: *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1.

Table 3 Correlation Analysis

Firm sample	<i>F_SDR0A</i>	<i>F_FIRP</i>	<i>F_FIRSQ</i>	<i>F_GOV</i>	<i>F_DUALITY</i>	<i>F_LNBDSIZE</i>	<i>F_INDRATIO</i>	<i>F_LEV</i>	<i>F_CAP</i>	<i>F_CAPLI</i>	<i>F_GR</i>	<i>F_ROA</i>	<i>F_ROALI</i>	<i>F_LNTA</i>	<i>F_LNAGE</i>	<i>F_SEGNUM</i>
<i>F_SDR0A</i>	1	-0.134	-0.134	-0.154	0.123	-0.114	-0.203	0.205	-0.265	-0.266	-0.101	-0.394	-0.416	-0.235	0.253	-0.019
<i>F_FIRP</i>	0.000	1	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.502
<i>F_FIRSQ</i>	0.000	0.984	1	0.380	-0.134	-0.064	0.034	-0.161	0.015	-0.006	0.034	0.189	0.202	0.217	-0.171	-0.163
<i>F_GOV</i>	0.000	0.000	0.000	1	0.000	0.028	0.240	0.000	0.594	0.849	0.237	0.000	0.000	0.000	0.000	0.000
<i>F_DUALITY</i>	0.030	-0.106	-0.105	-0.124	1	-0.010	-0.130	0.091	-0.058	-0.053	0.344	0.014	0.033	0.000	0.703	0.033
<i>F_LNBDSIZE</i>	0.305	0.000	0.000	0.000	0.740	0.000	0.002	0.002	0.045	0.069	0.285	0.000	0.000	0.004	0.000	0.136
<i>F_INDRATIO</i>	-0.110	-0.049	-0.047	0.152	0.003	1	-0.105	0.011	-0.020	-0.021	0.019	0.073	0.066	0.201	-0.058	-0.026
<i>F_LEV</i>	0.000	0.089	0.104	0.000	0.921	-0.071	0.000	0.703	0.494	0.468	0.508	0.012	0.023	0.000	0.046	0.365
<i>F_ROA</i>	-0.171	0.021	0.018	-0.089	-0.071	0.014	1	-0.111	0.208	0.247	0.106	0.233	0.240	0.051	-0.491	-0.098
<i>F_ROALI</i>	0.000	0.460	0.544	0.002	0.015	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.000	0.001
<i>F_LNAGE</i>	0.505	-0.161	-0.152	-0.049	0.036	-0.012	-0.125	1	-0.142	-0.112	0.074	-0.316	-0.395	0.096	0.217	0.069
<i>F_SEGNUM</i>	0.000	0.000	0.000	0.089	0.213	0.683	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.001	0.000	0.018
<i>F_CAP</i>	-0.180	-0.034	-0.026	-0.119	-0.006	-0.037	0.145	-0.127	1	0.899	0.246	0.343	0.402	0.105	-0.324	0.032
<i>F_CAPLI</i>	0.000	0.236	0.363	0.000	0.827	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.264	0.264
<i>F_GR</i>	-0.161	-0.045	-0.038	-0.143	-0.013	-0.034	0.213	-0.100	0.851	1	0.224	0.281	0.352	0.098	-0.399	0.039
<i>F_ROA</i>	0.000	0.120	0.194	0.000	0.642	0.241	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.180
<i>F_ROALI</i>	0.111	-0.048	-0.045	-0.052	0.024	-0.027	-0.022	0.135	0.029	0.019	1	0.340	0.298	0.099	-0.085	0.002
<i>F_LNTA</i>	-0.564	0.096	0.122	0.071	0.415	0.344	0.441	0.000	0.321	0.508	0.000	0.000	0.001	0.003	0.948	0.002
<i>F_LNAGE</i>	0.000	0.000	0.000	0.000	0.040	0.002	0.000	0.000	0.000	0.000	0.340	1	0.932	0.315	-0.192	-0.034
<i>F_SEGNUM</i>	-0.663	0.222	0.219	0.087	-0.079	0.082	0.230	-0.541	0.274	0.251	-0.080	0.895	1	0.331	-0.255	-0.047
	0.000	0.000	0.000	0.003	0.006	0.005	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.106
	-0.273	0.234	0.249	0.213	-0.055	0.241	0.065	0.010	0.050	0.054	-0.086	0.334	0.355	1	0.026	-0.013
	0.000	0.000	0.000	0.000	0.060	0.000	0.024	0.731	0.085	0.060	0.003	0.000	0.000	0.372	0.649	0.000
	0.157	-0.153	-0.145	0.037	0.023	-0.067	-0.576	0.217	-0.244	-0.341	0.070	-0.171	-0.232	0.014	1	0.177
	0.000	0.000	0.000	0.196	0.437	0.020	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.619	0.000	0.000
	-0.033	-0.160	-0.142	-0.053	0.015	0.001	-0.088	0.068	0.032	0.042	-0.023	-0.012	-0.018	0.008	0.159	1
	0.261	0.000	0.000	0.069	0.614	0.978	0.002	0.020	0.276	0.150	0.436	0.688	0.540	0.770	0.000	0.000

Note: The lower-left triangle reports Pearson correlations, and the top-right triangle Spearman correlations. For each cell, the first line reports the correlation coefficient and the second line the significance level (p-value). *F_SDR0A* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1.

Table 3 Correlation Analysis (Continued)

Firm-year sample	F_SDROA	F_FIRP	F_FIRSQ	F_GOV	F_DUALITY	F_LNBSIZE	F_INDRATIO	F_LEV	F_CAP	F_CAPLI	F_GR	F_ROA	F_ROALI	F_LNTA	F_LNAGE	F_SEGNUM
FY_AROA	1	-0.090	-0.090	-0.099	0.015	-0.062	0.030	0.038	-0.136	-0.126	-0.063	0.063	0.031	-0.121	0.089	-0.040
FY_FIRP	-0.108	1	0.000	0.000	0.152	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000
FY_FIRSQ	0.000	0.983	1	0.351	-0.066	-0.039	-0.111	-0.178	0.069	0.051	0.047	0.117	0.159	0.155	-0.265	-0.163
FY_GOV	-0.098	0.000	0.000	1	-0.066	-0.039	-0.111	-0.178	0.069	0.051	0.047	0.117	0.159	0.155	-0.265	-0.163
FY_DUALITY	0.000	0.345	0.329	0.000	0.000	0.121	-0.145	-0.082	0.012	-0.009	0.015	0.001	0.015	0.153	-0.079	-0.075
FY_LNBSIZE	0.000	-0.067	-0.065	-0.064	0.000	0.000	0.000	0.000	0.276	0.430	0.155	0.946	0.171	0.000	0.000	0.000
FY_INDRATIO	0.012	0.000	0.000	-0.064	1	-0.025	-0.044	0.003	0.013	0.008	-0.015	-0.008	-0.006	-0.056	-0.031	-0.014
FY_LEV	0.259	0.000	0.000	0.000	0.000	0.022	0.000	0.787	0.226	0.484	0.154	0.464	0.553	0.000	0.004	0.208
FY_CAP	-0.068	-0.040	-0.040	0.116	-0.021	1	-0.010	0.005	0.033	0.037	0.037	0.018	0.031	0.180	-0.024	0.024
FY_CAPLI	0.000	0.000	0.000	0.000	0.046	0.377	0.637	0.637	0.002	0.001	0.001	0.093	0.004	0.000	0.029	0.023
FY_LEV	0.046	-0.110	-0.115	-0.143	-0.058	0.020	1	0.192	-0.058	-0.017	0.023	0.007	-0.122	0.186	0.362	0.123
FY_CAP	0.000	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.118	0.031	0.531	0.000	0.000	0.000	0.000
FY_CAPLI	0.163	-0.181	-0.170	-0.094	0.013	-0.010	0.177	1	-0.181	-0.127	-0.012	-0.168	-0.316	0.167	0.304	0.108
FY_GR	0.000	0.000	0.000	0.000	0.236	0.337	0.000	0.000	0.000	0.000	0.262	0.000	0.000	0.000	0.000	0.000
FY_ROA	-0.090	0.017	0.019	-0.036	0.024	-0.018	-0.083	-0.155	1	0.551	0.219	0.305	0.383	0.093	-0.265	0.016
FY_ROALI	0.000	0.112	0.080	0.001	0.028	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.135
FY_LNTA	-0.077	0.007	0.009	-0.054	0.006	-0.012	-0.055	-0.114	0.415	1	0.175	0.174	0.318	0.133	-0.286	0.032
FY_LNAGE	0.000	0.525	0.391	0.000	0.566	0.270	0.000	0.000	0.000	0.059	0.000	0.000	0.000	0.000	0.000	0.003
FY_SEGNUM	-0.039	-0.004	-0.004	-0.032	-0.001	0.001	-0.001	0.020	0.068	0.059	1	0.369	0.162	0.059	-0.092	0.019
	0.000	0.719	0.712	0.003	0.900	0.913	0.938	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
	-0.430	0.131	0.131	0.051	-0.016	0.038	0.014	-0.182	0.175	0.090	0.248	1	0.699	0.118	-0.112	-0.051
	0.000	0.000	0.000	0.000	0.149	0.000	0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	-0.165	0.166	0.164	0.064	-0.019	0.049	-0.094	-0.418	0.229	0.188	0.035	0.498	1	0.126	-0.264	-0.083
	0.000	0.000	0.000	0.000	0.079	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
	-0.144	0.169	0.175	0.164	-0.062	0.201	0.193	0.052	-0.010	0.024	-0.047	0.150	0.204	1	0.127	0.052
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.024	0.000	0.000	0.000	0.000	0.000	0.000
	0.111	-0.248	-0.247	-0.071	-0.032	-0.010	0.359	0.300	-0.244	-0.259	-0.019	-0.100	-0.226	0.113	1	0.204
	0.000	0.000	0.000	0.000	0.003	0.335	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.000	0.000	0.000
	-0.045	-0.152	-0.138	-0.064	-0.014	0.032	0.132	0.084	0.001	0.011	0.017	-0.016	-0.040	0.052	0.193	1
	0.000	0.000	0.000	0.000	0.189	0.003	0.000	0.000	0.904	0.318	0.117	0.146	0.000	0.000	0.000	0.000

Note: the lower-left triangle reports Pearson correlations, and the top-right triangle Spearman correlations. For each cell, the first line reports the correlation coefficient and the second line the significance level (p-value). Variables are defined in Table 1.

Next we group the firm-year sample into two subsamples, firm-years controlled by state shareholders (GROUP 4, 6541 obs.) and firm-years controlled by non-state shareholders (GROUP 5, 2045 obs.). Again non-state-controlled firms have significantly higher operating risks.

To summarise, non-state control is related to higher operating risks. This may be because CEOs in such firms have more decision-making power and enjoy a lower entrenchment effect; also, these firms face more uncertainties in their operations.

4. Regression analysis

We next conduct a regression analysis to investigate those factors driving the level and the variability of firm operating performance. Table 5 reports the results. The results in columns (3), (4), (7), and (8) reveal that after we control for other factors influencing firm risk, state-controlled firms have lower operating risk than non-state-controlled firms. At the same time, the regression results in columns (1), (2), (5), and (6) show no significant difference in performance levels between state-controlled and non-state-controlled firms. This conclusion is consistent with Xu, Xin, and Chen (2006b).

The coefficients on the largest shareholder ownership (*FIRP*) are negative, but positive on its square, in both the firm and firm-year regressions of columns (3), (4), (7), and (8). The relation between ownership concentration and corporate risk is thus a non-linear U-shape rather than linear. But the relation between ownership concentration and corporate performance level is positively and linearly related (columns (2) and (6)).

We then conduct group regressions where we investigate the relation between ownership structure and firm performance for state-controlled and non-state-controlled firms separately. Tables 6 and 7 report the results. The U-shaped relation between ownership concentration and corporate risk are shown to exist only in state-controlled firms (columns (3), (4), (7), and (8) of Table 6) and not in non-state-controlled firms (columns (3), (4), (7), and (8) of Table 7). This indicates that in state-controlled firms, overly concentrated ownership results in state decision-making, whereas overly dispersed ownership results in CEO decision-making. Both are related to extreme and high uncertainty decision-making and therefore result in more volatile firm performance. Overall, the relation between ownership concentration and corporate risk is non-linear and U-shaped. In the non-state-controlled firms, as ownership concentration increases, so does the decision-making and entrenchment effects. The off-setting result is that no significance relation exists between ownership concentration and corporate risk.

Table 4 Comparison Analysis: Type of Ownership and Corporate Operating Risks

Panel A: <i>F_SDROA</i>	GROUP 1	GROUP 2	GROUP 3	
	(State-controlled)	(Non-state-controlled)	Begins with state-controlled but ends with non-state-controlled	
Mean	4.7187	7.0150	8.1211	
Median	2.9321	3.0945	5.0245	
Obs.	787	194	185	
	GROUP 1 vs GROUP 2	GROUP 1 vs GROUP 3	GROUP 2 vs GROUP 3	
T-statistics	2.921***	4.389***	1.046	
Z-statistics	1.866*	6.291***	3.287***	
Panel B: <i>FY_AROA</i>	GROUP 4	GROUP 5	GROUP 4 vs GROUP 5	
	(State-controlled)	(Non-state-controlled)		
Mean	4.2667	5.6497	T-statistics	8.907***
Median	2.7878	3.6437	Z-statistics	9.152***
Obs.	6541	2045	–	–

Note: GROUP 1 represents firms controlled by state shareholders across the sample period; GROUP 2 represents firms controlled by non-state shareholders across the sample period; GROUP 3 represents firms beginning with state control but ending with non-state control during the sample period; GROUP 4 represents firm-years controlled by state shareholders; GROUP 5 represents firm-years controlled by non-state shareholders. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. When comparing means between groups, we use a T-test of equality-of-means (T-statistics reported); when comparing medians between groups, we use the Mann-Whitney nonparametric test of equality-of-medians (Z-statistics reported). ***, **, and * represent a difference significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

We notice that in columns (1), (2), (5) and (6) of Tables 6 and 7, ownership concentration and firm performance are positively related in both state-controlled and non-state-controlled firms; that is, the higher the concentration, the better the performance. In addition, the coefficient on *FIRP* is larger for non-state-than for state-controlled firms. This result is consistent with Xu, Xin, and Chen (2006a).

In contrast to the literature (e.g., Cheng, 2008; Adams, Almeida, and Ferreira, 2005), we fail to find a consistent conclusion on the relation between firm risk and other corporate governance variables (i.e. CEO duality, board size, and ratio of independent directors) in the firm and the firm-year samples.¹³ Finally, as expected, firm characteristics are closely related to corporate risk. We find that leverage has a positive relation in both the firm and firm-year samples and in both the state-controlled and non-state-controlled firms. In addition, firm size and diversification are negatively related to corporate performance.

¹³ This result in fact indicates that in China the most important future of corporate governance is ownership structure and that the role of other corporate governance mechanisms is relatively weak.

Table 5 Regression Analyses: Whole Sample

	Firm sample				Firm-year sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.041 (0.83)	0.033 (3.33)***	-0.138 (-2.24)**	0.012 (0.96)	0.015 (0.59)	0.041 (7.85)***	-0.089 (-5.38)***	-0.001 (-0.23)
<i>FIRSQ</i>	0.000 (-0.16)		0.002 (2.49)**		0.000 (1.06)		0.001 (5.45)***	
<i>GOV</i>	0.029 (0.07)	0.031 (0.08)	-2.287 (-4.71)***	-2.330 (-4.79)***	-0.210 (-1.04)	-0.223 (-1.11)	-0.648 (-4.93)***	-0.693 (-5.28)***
<i>DUALITY</i>	-0.039 (-0.07)	-0.038 (-0.07)	-1.468 (-2.14)**	-1.488 (-2.16)**	-0.124 (-0.54)	-0.125 (-0.54)	-0.040 (-0.27)	-0.041 (-0.28)
<i>LNBDSIZE</i>	1.066 (1.39)	1.068 (1.40)	-1.541 (-1.63)	-1.575 (-1.66)*	0.623 (1.86)*	0.620 (1.85)*	-0.448 (-2.05)**	-0.458 (-2.09)**
<i>INDRATIO</i>	0.155 (5.88)***	0.155 (5.88)***	-0.076 (-2.30)**	-0.077 (-2.34)**	0.037 (3.03)***	0.037 (3.03)***	-0.002 (-0.21)	-0.002 (-0.25)
<i>LEV</i>	-0.115 (-14.62)***	-0.115 (-14.64)***	0.113 (9.63)***	0.113 (9.61)***	-0.058 (-14.77)***	-0.058 (-14.73)***	0.032 (11.66)***	0.033 (11.87)***
<i>CAP</i>	0.386 (3.93)***	0.386 (3.93)***	-0.028 (-0.23)	-0.022 (-0.18)	0.274 (11.82)***	0.274 (11.83)***	0.005 (0.30)	0.005 (0.30)
<i>CAPLI</i>	-0.035 (-0.35)	-0.035 (-0.35)	-0.048 (-0.40)	-0.047 (-0.39)	0.005 (0.24)	0.005 (0.24)	-0.044 (-3.20)***	-0.044 (-3.20)***
<i>GR</i>	0.005 (2.26)**	0.005 (2.26)**	0.003 (0.99)	0.003 (1.04)	0.034 (24.96)***	0.034 (24.96)***	0.007 (7.43)***	0.007 (7.40)***
<i>ROA</i>			0.088 (1.30)	0.093 (1.38)			-0.342 (-43.82)***	-0.341 (-43.68)***
<i>ROALI</i>			-0.840 (-10.56)***	-0.849 (-10.66)***			0.127 (14.10)***	0.127 (14.06)***
<i>LNTA</i>	1.836 (10.43)***	1.833 (10.48)***	-0.779 (-3.33)***	-0.712 (-3.06)***	1.081 (11.57)***	1.087 (11.67)***	-0.732 (-11.69)***	-0.710 (-11.35)***
<i>LNAGE</i>	0.861 (1.92)*	0.861 (1.92)*	-0.661 (-1.19)	-0.667 (-1.20)	-0.629 (-3.46)***	-0.634 (-3.48)***	0.561 (4.72)***	0.547 (4.59)***
<i>SEGNUM</i>	0.150 (1.16)	0.148 (1.16)	-0.371 (-2.34)**	-0.345 (-2.17)**	0.083 (1.40)	0.087 (1.46)	0.255 (-6.59)***	-0.243 (-6.28)***
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year					Controlled	Controlled	Controlled	Controlled
Obs.	1193	1193	1193	1193	8586	8586	8586	8586
Adj. R ²	0.3498	0.3503	0.5169	0.5147	0.1932	0.1932	0.2584	0.2559
F statistics	19.86***	20.48***	36.42***	37.12***	51.13***	52.38***	70.56***	71.29***

Note: To save room, independent variables are not denoted by *F_* or *FY_*. The results for constant items are omitted. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. T-statistics are reported in brackets. ***, **, and * represent coefficients statistically significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

The results on the relation between profitability and firm risk, however, are rather complex in Tables 5-7. Corporate risk is negatively related to current profitability but positively to prior profitability in the firm-year regressions, which is in agreement with Cheng (2008). But in the firm regressions, since ROA and lagged ROA are likely to be very close, we observe that the relation between profitability and corporate risk varies in different samples. One possible reason is that in China's emerging economy, firm profitability tends to be more volatile. In firm regressions, we use mean values in which variations across firms are lost. This in turn produces inconsistent coefficients compared with those in the firm-year regressions.

V. Endogeneity and Robustness Checks

1. Endogeneity tests

In the above empirical tests, we find that the relation between ownership concentration and corporate risk are U-shaped, and this relation is more obvious in state-controlled firms. Our causality runs from ownership concentration to firm performance variability. But it is very possible that ownership concentration is a natural response to a firm's operating environment, which is closely related to corporate risk. We therefore conduct more tests to exclude this possible reverse causality problem. Before doing so, we delete those firms that experience changes in the type of shareholder.¹⁴

In our first check, we use the very beginning ownership concentration for each firm in the sample period to replace average ownership concentration in the firm regressions and ownership concentration for each year in the firm-year regressions. This method can relieve the endogeneity problem in part. We also conduct two-stage least squares (2SLS) regressions, in which we use the mean-adjusted ownership concentration and its square to eliminate the multicollinearity between ownership and its square. In the 2SLS regressions of firm performance (F_ROA and FY_ROA as the dependent variables), we use the mean-adjusted beginning ownership concentration as the instrument of concentration. In the 2SLS regressions of corporate risk (F_ADROA and FY_SDROA as the dependent variables), we use the square of the mean-adjusted beginning ownership concentration as the instrument of the square of concentration ($FIRSQ$).

Table 8 reports the results, which are highly consistent with those in Tables 5, 6, and 7. In particular, we find that corporate operating risks are higher in the non-state-controlled firms, while a U-shaped relation exists between ownership concentration and firm risk in the state-controlled firms. But the type of ownership makes no significant difference in levels of firm performance. Still, as ownership concentration increases, firm performance improves, and this effect is more obvious in the non-state-controlled firms.

¹⁴ Since changes in shareholder type are likely to result in business restructuring, strategic relocation, and so forth, which are likely to lead to greater business risk, we delete these firms to obtain a cleaner sample.

Table 6 Regression Analyses: State-controlled Sample

	Firm sample				Firm-year sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.017 (0.30)	0.027 (2.56)**	-0.146 (-2.20)**	0.009 (0.73)	-0.001 (-0.04)	0.032 (5.86)***	-0.091 (-4.90)***	0.000 (-0.10)
<i>FIRSQ</i>	0.000 (0.18)		0.002 (2.38)**		0.000 (1.20)		0.001 (4.98)***	
<i>DUALITY</i>	-0.585 (-0.90)	-0.586 (-0.90)	-0.738 (-0.95)	-0.757 (-0.97)	-0.195 (-0.77)	-0.194 (-0.77)	0.027 (0.16)	0.032 (0.19)
<i>LNBDSIZE</i>	0.685 (0.84)	0.680 (0.83)	-0.512 (-0.52)	-0.580 (-0.59)	0.177 (0.50)	0.171 (0.49)	-0.342 (-1.45)	-0.356 (-1.51)
<i>INDRATIO</i>	0.127 (4.37)***	0.127 (4.37)***	-0.073 (-2.09)**	-0.077 (-2.20)**	0.041 (3.23)***	0.041 (3.22)***	-0.009 (-1.02)	-0.009 (-1.09)
<i>LEV</i>	-0.108 (-11.64)***	-0.108 (-11.65)***	0.095 (7.26)***	0.094 (7.18)***	-0.066 (-15.12)***	-0.066 (-15.10)***	0.029 (9.29)***	0.029 (9.39)***
<i>CAP</i>	0.342 (3.01)***	0.342 (3.00)***	-0.096 (-0.71)	-0.110 (-0.80)	0.270 (10.52)***	0.270 (10.51)***	0.020 (1.12)	0.019 (1.08)
<i>CAPLI</i>	0.005 (0.04)	0.005 (0.05)	0.104 (0.78)	0.119 (0.88)	-0.002 (-0.06)	-0.002 (-0.07)	-0.060 (-3.77)***	-0.060 (-3.78)***
<i>GR</i>	0.008 (2.42)**	0.008 (2.44)**	0.012 (3.15)***	0.012 (3.24)***	0.034 (21.48)***	0.034 (21.50)***	0.009 (8.30)***	0.009 (8.33)***
<i>ROA</i>			0.464 (4.96)***	0.472 (5.04)***			-0.327 (-35.12)***	-0.327 (-35.00)***
<i>ROALI</i>			-1.019 (-9.49)***	-1.029 (-9.56)***			0.159 (14.96)***	0.159 (14.95)***
<i>LNTA</i>	1.546 (8.20)***	1.549 (8.26)***	-0.714 (-2.97)***	-0.659 (-2.75)***	1.222 (12.27)***	1.227 (12.33)***	-0.587 (-8.56)***	-0.574 (-8.36)***
<i>LNAGE</i>	0.363 (0.75)	0.360 (0.75)	0.642 (1.11)	0.592 (1.02)	-0.622 (-3.26)***	-0.630 (-3.31)***	0.872 (6.82)***	0.848 (6.63)***
<i>SEGNUM</i>	0.268 (1.94)*	0.271 (1.97)*	-0.381 (-2.30)**	-0.343 (-2.07)**	0.020 (0.31)	0.025 (0.40)	-0.218 (-5.12)***	-0.201 (-4.74)***
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year					Controlled	Controlled	Controlled	Controlled
Obs.	787	787	787	787	6541	6541	6541	6541
Adj. R ²	0.3679	0.3687	0.4418	0.4384	0.2068	0.2068	0.2180	0.2152
F statistics	14.86***	15.35***	18.78***	19.04***	43.63***	44.71***	44.41***	44.73***

Note: To save room, independent variables are not denoted by *F_* or *FY_*. The results for constant items are omitted. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. T-statistics are reported in brackets. ***, **, and * represent coefficients statistically significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

Table 7 Regression Analyses: Non-state-controlled Sample

	Firm sample				Firm-year sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>F_ROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	-0.015 (-0.09)	0.091 (2.52)**	-0.043 (-0.20)	0.003 (0.07)	0.013 (0.18)	0.080 (5.16)***	-0.060 (-1.38)	-0.013 (-1.35)
<i>FIRSQ</i>	0.001 (0.63)		0.001 (0.22)		0.001 (0.97)		0.001 (1.11)	
<i>DUALITY</i>	-0.894 (-0.61)	-0.875 (-0.60)	-1.575 (-0.85)	-1.562 (-0.85)	-0.002 (-0.00)	-0.006 (-0.01)	-0.192 (-0.61)	-0.195 (-0.62)
<i>LNBDSIZE</i>	5.510 (2.26)**	5.475 (2.26)**	-3.965 (-1.27)	-3.991 (-1.28)	1.813 (2.09)**	1.799 (2.07)**	-0.886 (-1.66)*	-0.896 (-1.68)*
<i>INDRATIO</i>	0.276 (3.52)***	0.281 (3.60)***	-0.094 (-0.92)	-0.092 (-0.90)	0.037 (1.19)	0.038 (1.22)	0.019 (1.00)	0.020 (1.03)
<i>LEV</i>	-0.097 (-4.03)***	-0.095 (-3.99)***	0.178 (4.80)***	0.179 (4.92)***	-0.029 (-3.29)***	-0.029 (-3.23)***	0.042 (7.05)***	0.042 (7.14)***
<i>CAP</i>	0.582 (2.42)**	0.598 (2.51)**	-0.004 (-0.01)	0.002 (0.01)	0.289 (5.73)***	0.291 (5.78)***	-0.018 (-0.58)	-0.017 (-0.54)
<i>CAPLI</i>	-0.211 (-0.89)	-0.213 (-0.90)	-0.323 (-1.08)	-0.324 (-1.09)	0.037 (0.80)	0.039 (0.85)	-0.011 (-0.38)	-0.009 (-0.32)
<i>GR</i>	0.031 (3.35)***	0.031 (3.33)***	0.001 (0.11)	0.001 (0.10)	0.033 (12.19)***	0.033 (12.18)***	0.004 (2.18)**	0.004 (2.17)**
<i>ROA</i>			-0.576 (-4.26)***	-0.577 (-4.28)***			-0.387 (-26.17)***	-0.386 (-26.15)***
<i>ROALI</i>			-0.254 (-1.43)	-0.251 (-1.42)			0.067 (3.93)***	0.068 (3.94)***
<i>LNTA</i>	2.580 (4.01)***	2.604 (4.06)***	-1.162 (-1.35)	-1.158 (-1.35)	0.689 (2.93)***	0.712 (3.04)***	-1.261 (-8.53)***	-1.246 (-8.47)***
<i>LNAGE</i>	2.702 (1.92)*	2.820 (2.02)**	-2.664 (-1.48)	-2.613 (-1.47)	-0.385 (-0.80)	-0.376 (-0.78)	-0.445 (-1.50)	-0.438 (-1.48)
<i>SEGNUM</i>	0.417 (1.01)	0.441 (1.07)	-0.065 (-0.12)	-0.055 (-0.11)	0.232 (1.61)	0.239 (1.66)*	-0.276 (-3.11)***	-0.272 (-3.06)***
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year					Controlled	Controlled	Controlled	Controlled
Obs.	194	194	194	194	2045	2045	2045	2045
Adj. R ²	0.3761	0.3785	0.5520	0.5547	0.1921	0.1921	0.3474	0.3473
F statistics	4.64***	4.79***	8.00***	8.29***	13.15***	13.46***	26.91***	27.53***

Note: To save room, the denotations *F_* or *FY_* for independent variables are omitted. The results for constant items are also omitted. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. T-statistics are reported in brackets. ***, **, and * represent coefficients statistically significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

Table 8 Endogeneity Tests

Panel A:	Using beginning ownership concentration				2SLS			
	Firm sample		Firm-year sample		Firm sample		Firm-year sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Whole sample	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (2.24)**		0.001 (4.49)***		0.002 (2.27)**		0.001 (4.48)***
<i>FIRP</i>	0.022 (2.21)**	-0.123 (-2.09)**	0.018 (3.31)***	-0.083 (-4.66)***	0.025 (2.26)**	0.005 (0.35)	0.021 (3.32)***	-0.005 (-1.30)
<i>GOV</i>	0.070 (0.17)	-2.330 (-4.61)***	-0.016 (-0.07)	-0.703 (-4.54)***	0.053 (0.13)	-2.331 (-4.70)***	-0.033 (-0.14)	-0.744 (-4.83)***
Obs.	981	981	6982	6982	981	981	6982	6982
Adj. R ²	0.3298	0.4543	0.1994	0.2221	0.3558	0.4752	0.2068	0.2269
F statistics	15.61***	23.66***	44.47***	47.36***	536.57***	886.75***	1795.51***	2047.27
Panel B:	Firm sample		Firm-year sample		Firm sample		Firm-year sample	
State sample	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)	(7a)	(8a)
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (2.10)**		0.001 (3.92)***		0.002 (2.12)**		0.001 (3.82)***
<i>FIRP</i>	0.017 (1.79)*	-0.118 (-1.96)**	0.013 (2.41)**	-0.081 (-4.04)***	0.020 (1.83)*	0.001 (0.04)	0.015 (2.43)**	-0.008 (-1.85)*
Obs.	787	787	5682	5682	787	787	5682	5682
Adj. R ²	0.3659	0.4407	0.2127	0.1773	0.3941	0.4667	0.2201	0.1840
F statistics	15.17***	18.70***	40.37***	30.15***	508.79***	687.26***	1589.36***	1275.07***
Panel C:	Firm sample		Firm-year sample		Firm sample		Firm-year sample	
Non-state sample	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)	(7b)	(8b)
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRSQ</i>		0.001 (0.39)		0.000 (0.61)		0.001 (0.42)		0.001 (1.41)
<i>FIRP</i>	0.059 (1.73)*	-0.073 (-0.37)	0.037 (2.06)**	-0.047 (-0.94)	0.068 (1.91)*	0.017 (0.32)	0.043 (2.10)**	0.006 (0.40)
Obs.	194	194	1300	1300	194	194	1300	1300
Adj. R ²	0.3658	0.5523	0.2104	0.3805	0.4770	0.6308	0.2402	0.3980
F statistics	4.59***	8.00***	10.11***	20.46***	173.50***	331.68***	399.48***	863.29***

Note: To save room, the denotations *F_* or *FY_* for independent variables are omitted. The results for constant items are also omitted. Other corporate governance variables, firm characteristics, and industry fixed effects are controlled but not reported. Year fixed effects are controlled in the firm-year regressions. The sample excludes firms experiencing changes in type of shareholder during the sample period. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. T-statistics are reported in brackets. ***, **, and * represent coefficients statistically significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

2. Robustness checks

To make sure our results are robust, we conduct a series of robustness tests:

1. Instead of using a winsorised sample, we use a truncated sample.¹⁵
2. Since ownership and ownership concentration are highly correlated, we use the mean adjusted ownership concentration and its square.
3. During special periods, structural changes occur in the corporate governance and financial reporting environments that might affect our conclusions. Therefore, we repeat our firm-year tests for two special periods: 2001–2006 and 2003–2006.¹⁶
4. We exclude firms that experience significant changes in ownership type and ownership structure since these are likely to be related to business restructurings, changes in strategic goals, and so forth. Such exclusion thus leaves us a sample with stable ownership structure and excludes noise in the sample.¹⁷
5. Since current and lagged ROA and current and lagged capital expenditure are likely to be highly correlated, we delete current ROA and current capital expenditure to eliminate the effect of multicollinearity.
6. To relieve the effects of earnings management, we use only firm-years with clean, unqualified audit opinions (7692 firm-years).¹⁸

¹⁵ In the truncated sample, we exclude extreme values. The criteria are as follows: ownership concentration ≤ 85 ; absolute value of current ROA and lagged ROA < 100 ; leverage < 100 ; growth falling between -100 and 800 ; current *CAP* and lagged *CAP* > 0 but < 50 ; *SDROA* < 60 , and so forth. We delete observations with values outside the above range, which reduces the sample size from 8586 firm-years to 8333 firm-years and the number of firms from 1193 to 1158.

¹⁶ Prior to 2001, very few listed companies in China had independent directors. In June 2001, the China Securities Regulatory Commission required that at least one third of directors be independent and that all listed companies meet this requirement before June 2003. After 2003, most companies had successfully met this requirement. Starting from January 2007, China adopted new accounting standards that converged with the International Financial Reporting Standards (IFRS). The biggest difference between the new GAAP and the old GAAP lies in the importance of the measurement concept of fair value in the new standards, resulting in a different method for recognizing losses and gains, and assets and liabilities. We thank the anonymous reviewers for reminding us of the effect of the above structural changes.

¹⁷ Stable ownership structure refers to those firms who experience no changes in ownership type, and those whose value of changes in ownership percentage during a fiscal year falls around the mean (-3.590838) and within the range of one standard deviation (5.883057). Such firms are less likely to make changes in business structure and strategic goals.

¹⁸ We thank the anonymous reviewers for figuring this out. Note that in the Table 9 tests (6), type of ownership (GOV) significantly influences profitability (ROA), which differs from all other performance regressions. Further analysis finds that among the excluded qualified firms (894 firm-years), 309 firm-years are non-state firms with a mean and median ROA of -6.845% and -2.772 , respectively. These firms have an obviously worse performance than deleted state firms (585 firm-years), with a mean and median ROA of -4.419 and 0.282 , respectively. The above differences are statistically significant at the 1% level. The result is that in the remaining sample non-state firms perform better. We do not go any deeper since this study focuses on ownership structure and corporate risk, not corporate performance.

7. Following Francis, LaFond, Olsson, and Schipper's (2005) method to measure accruals quality, we use an alternative measure for corporate risk. Instead of using the absolute value of residuals in firm-year regressions, we use the standard deviation of residuals for four successive years (the current year and three lagged years) as the measure of corporate risk, named *FY_SDRE*.¹⁹ Using this alternative measure of corporate risk, we reduce the samples to 4695 firm-years.

In all the above seven robustness checks, our conclusions are essentially similar. Table 9 reports the empirical results.

VI. Conclusions

This study investigates the effect of ownership structure on firm operating risks. We find that these risks are higher among non-state-controlled than state-controlled firms because managers in the former have bigger decision-making rights and enjoy less entrenchment, while these firms also face a more uncertain operating environment. We also find a non-linear, U-shaped relation between ownership concentration and corporate risk, although this relation holds only for state-controlled firms. This U-shaped relation is the result of greater state decision-making effects in state-controlled firms with a highly concentrated ownership, and of greater CEO decision-making effects in state-controlled firms with a highly dispersed ownership. Finally, leverage is positively related to corporate risk and firm size, while diversification is negatively related to corporate risk.

At the same time, consistent with Xu, Xin, and Chen (2006a, 2006b), we find ownership concentration to be positively related to firm performance, and this relation is more significant in non-state-controlled firms. But the type of ownership has no significant influence on firm performance. Table 10 summarises the empirical results of this study.

Our study has two important contributions. First, the study on corporate risk helps us better understand the effect of corporate governance on the firm decision-making process and its micro-economic consequences. And second, the study combines agency theory with group decision-making theory to explain economic phenomena.

Our study also reveals that in state-controlled firms, a relatively concentrated ownership with proper balance from outside shareholders helps reduce corporate operating risk. In such firms, the compromises and the communication among shareholders and between shareholders and managers help firms avoid either extremely good or extremely bad decisions. But overly concentrated ownership centralises decision-making power in the hands of the shareholders, while overly dispersed ownership

¹⁹ The authors thank the anonymous reviewers for suggesting the use of this alternative measure for corporate risk.

Table 9 Robustness Tests

	(1) Truncated sample				(2) Using mean-adjusted ownership concentration			
	Firm sample		Firm-year sample		Firm sample		Firm-year sample	
	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>	<i>FY_ROA</i>	<i>FY_AROA</i>
<i>FIRP</i>	0.031 (3.05)***	-0.099 (-2.26)**	0.038 (6.62)***	-0.081 (-4.59)***	0.033 (3.33)***	0.009 (0.73)	0.041 (7.85)***	-0.003 (-0.98)
<i>FIRSQ</i>		0.001 (2.29)**		0.001 (4.60)***		0.002 (2.49)***		0.001 (5.45)***
<i>GOV</i>	0.312 (0.78)	-1.633 (-4.49)***	-0.056 (-0.25)	-0.842 (-5.74)***	0.031 (0.08)	-2.287 (-4.71)***	-0.223 (-1.11)	-0.648 (-4.93)***
Obs.	1158	1158	8333	8333	1193	1193	8586	8586
Adj. R ²	0.3115	0.4283	0.1734	0.3074	0.3503	0.5169	0.1932	0.2584
F statistics	16.86***	25.07***	44.69***	87.01***	20.48***	36.42***	52.38***	70.56***
	(3) Special sample period				(4) Sample with stable ownership structure		(5) Current ROA and current CAP deleted	
	Firm-year sample		Firm-year sample		Firm sample		Firm-year sample	
	2001-2006		2003-2006		<i>F_ROA</i>	<i>F_SDROA</i>	<i>F_ROA</i>	<i>F_SDROA</i>
<i>FIRP</i>	0.039 (6.62)***	-0.097 (-5.24)***	0.038 (5.16)***	-0.108 (-4.57)***	0.039 (3.42)***	-0.147 (-2.08)**	0.034 (3.35)***	-0.140 (-2.27)**
<i>FIRSQ</i>		0.001 (5.26)***		0.001 (4.63)***		0.002 (2.31)**		0.002 (2.53)**
<i>GOV</i>	0.224 (0.98)	-0.614 (-4.27)***	0.407 (1.49)	-0.698 (-4.01)***	0.092 (0.21)	-2.124 (-3.86)***	0.025 (0.06)	-2.265 (-4.67)***
Obs.	6649	6649	4620	4620	837	837	1193	1193
Adj. R ²	0.2076	0.3173	0.2253	0.2990	0.3680	0.4495	0.3422	0.5170
F statistics	46.84***	76.36***	38.32***	51.52***	15.75***	19.96***	20.38***	38.52***
	(6) Nonqualified audit opinion sample		(7) Alternative corporate risk measurement					
	Firm-year sample		Firm-year sample					
	<i>FY_ROA</i>	<i>FY_AROA</i>	<i>FY_ROA</i>	<i>FY_SDRE</i>				
<i>FIRP</i>	0.027 (6.25)***	-0.061 (-4.17)***	0.045 (5.76)***	-0.062 (-3.79)***				
<i>FIRSQ</i>		0.001 (3.91)***		0.001 (4.44)***				
<i>GOV</i>	-0.825 (-4.94)***	-0.333 (-2.83)***	-0.201 (-0.72)	-0.416 (-3.38)***				
Obs.	7692	7692	4695	4695				
Adj. R ²	0.1670	0.0793	0.2013	0.4071				
F statistics	39.55***	16.41***	32.97***	81.59***				

Note: To save room, the denotations *F_* or *FY_* for independent variables are omitted. The results for constant items are also omitted. Other corporate governance variables, firm characteristics, and industry fixed effects are controlled but not reported. Year fixed effects are controlled in firm-year regressions. *F_SDROA* is the standard deviation of a firm's annual ROA during the sample period. Other variables are defined in Table 1. T-statistics are reported in brackets. ***, **, and * represent coefficients statistically significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

Table 10 Summary of Empirical Results

		Firm sample		Firm-year sample	
		Performance	Risk	Performance	Risk
		ROA	<i>SDROA</i>	ROA	<i>SDROA</i>
Whole sample	Ownership concentration	+ sig.	U-shaped	+ sig.	U-shaped
	Type of ownership	not sig.	- sig.	not sig.	- sig.
State sample	Ownership concentration	+ sig.	U-shaped	+ sig.	U-shaped
Non-state sample	Ownership concentration	+ sig.	not sig.	+ sig.	not sig.

concentrates it in the hands of the CEOs, which in turn results in higher operating risks. The study also shows that ownership type is important in determining corporate risk. Therefore, in evaluating the economic consequences of ownership structure, one should evaluate not only the level of firm performance but also its variability. Finally, leverage, firm size, and diversification are also related to corporate risk. Therefore, firm characteristics are important indicators in judging firm risk. Understanding the above risk factors will help investors make better investment decisions.

References

Please refer to pp. 24-26.