

## 独立董事辞职的影响因素：理论框架与实证分析<sup>1</sup>

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### 摘要

本文将独立董事任职的相关成本分为现实成本、机会成本和风险成本等三大类，它们分别从不同的角度影响独立董事任职的总效用水平，从而最终影响其辞职的选择。实证研究的结果表明，独立董事的个人特征是其决定是否辞职的重要因素，以开会次数和独立董事地域特征为代表的独立董事任职现实成本、以公司重大担保、重大诉讼、重大关联交易等重大事项的发生情况以及审计意见的严重程度等为代表的风险成本与独立董事辞职显著相关，而薪酬对独立董事辞职却无显著作用，同时没有证据表明常见的公司治理静态特征指标是影响独立董事辞职的主要原因。

关键词：独立董事、辞职、成本、个人因素、公司因素

### 一、引言

现代企业制度通常赋予董事会在企业的最高决策经营权以及大部分的决策控制权，被认为是企业中一组契约的最高内部监督者（Fama，1980；Fama

<sup>1</sup> 国家自然科学基金重点项目“产权保护导向的会计控制研究”（70532003）阶段性成果。感谢中山大学管理学院刘峰教授为本文提出的重要修改意见。本文曾提交中国第三届实证会计国际研讨会（天津南开大学，2004年12月），感谢清华大学李志文教授和重庆大学刘斌教授以及其他与会代表对本文的评论和修改意见。感谢香港理工大学俞伟峰教授及两位匿名评审人对本文提出的修改意见。上述有关人士的意见均在文中得到了体现。文中错误概由作者承担。

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和 Jensen, 1983), 因此, 传统的公司治理理论认为, 董事会作为企业最重要的内部治理机制, 在公司治理中起着核心作用。而在没有监事会的情形下, 独立董事在董事会中的地位及其作用的发挥则是董事会结构中一个极其重要的方面。经过多年的实践, 独立董事制度逐渐成为以英美为代表的许多国家公司治理制度的重要组成部分, 并发挥重要作用。

我国上市公司公司治理的先天缺陷, 一方面“一股独大”现象比较普遍, 另一方面国有产权主体的缺位导致了企业内部人的“越位”情况严重, 董事会往往沦为大股东的一言堂和内部人的“橡皮图章”。因此证券市场监管者和参与者期望通过在董事会中引入独立于经营者的股东利益代言人, 增强董事会的独立性和监督职能, 提高公司治理水平, 保护外部股东利益。2001年8月, 证监会发布《关于在上市公司建立独立董事制度的指导意见》(以下简称《指导意见》), 在我国境内外上市公司全面实施独立董事制度。

在独立董事制度的实际执行过程中, 由于各种原因, 也有些独立董事请辞所担任的独立董事, 有些独立董事甚至是在刚担任独立董事不久后即提出辞职。据我们的不完全统计<sup>5</sup>, 从2001年11月到2004年3月, 我国证券市场共发生独立董事辞职190起, 其中, 2001年最后两个月7起, 2002年58起, 2003年105起, 2004年前三个月20起。

有趣的是, 一些独立董事在辞去一些公司独立董事职务的同时, 却仍在其他公司继续担任独立董事。由此引发我们考虑如下问题: 为什么会有如此多的独立董事辞职? 哪些独立董事更容易辞职? 那些辞职的独立董事为什么只是部分辞职? 那些被辞职的公司与被留职的公司相比, 有明显的特征吗?

本文后面的内容安排如下: 第二部分提出本文的分析框架; 第三部分分析个人因素对独立董事辞职的影响; 第四部分研究公司因素对独立董事辞职的影响; 最后是本文的结论和对局限性的讨论。

## 二、独立董事的任职成本: 分析框架

从理性的经济人角度考虑, 独立董事在决定担任或不担任独立董事职务时, 均会对所能获得的收益和成本进行综合比较和权衡。进一步, 基于独立董事的某些特殊情况, 收益通常较为固定<sup>6</sup>, 我们认为, 独立董事对其收益和成本的考虑并不是对等的。事实上, 独立董事更可能在其任职之前就预期担任独

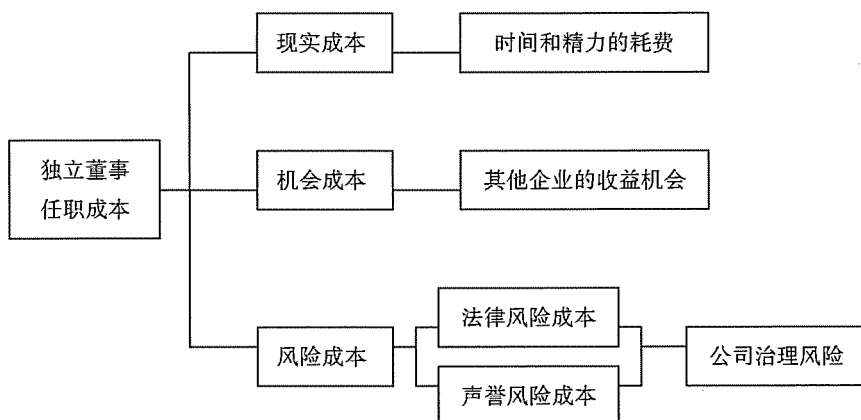
<sup>5</sup> 我们是根据公开获得的资料整理得到上述数据的。虽然不能确保有关数据没有缺漏, 但我们的统计方法可以基本保证不会有大的数据遗漏。

<sup>6</sup> 全面分析, 独立董事的收益既包括直接来源于任职公司的, 也应包括间接来源于其他方面(谭劲松, 2003)。目前情况下, 前者相对固定, 而后者则是不定的。

立董事可以得到的最低利益（物质的和非物质的），在此基础上结合其对履职成本的初步考虑做出是否任职的决定，之后，在履职过程中再重新评估其担任独立董事的各种成本，进而在权衡之下做出辞职或者其他选择的决策。相对于收益（特别是物质激励），成本更可能是变动的，也更难以在任职之前准确评估和预期，因此，成本的变动更可能是独立董事辞职的直接诱因。如果独立董事选择辞职，则很可能说明成本的变动使得其他选择下的总效用水平低于前者。因此，在独立董事进入企业已是既定事实的情况下，基于收益和成本的上述关系和分析方便的考虑，我们将从任职成本的角度分析独立董事在企业特定状况（通常在某些方面不利于独立董事）选择辞职的影响因素。

如图 1 所示，我们可以将独立董事任职的相关成本分为三大类：即现实成本、机会成本和风险成本，它们分别从不同的角度影响独立董事任职的总效用水平，从而最终影响其辞职的选择。

图一 独立董事任职成本分析



### （一）现实成本

现实成本指的是独立董事在履行其职责过程中现实发生的各种有形或者无形的成本。其中，独立董事为履行其职责而耗费的时间和精力无疑是其中最重要的部分。证监会的《指导意见》对独立董事履行其职责的充分性保证提出了时间和精力耗费的基本要求，规定独立董事应“确保有足够的时间和精力有效地履行独立董事的职责”，“独立董事连续 2 次无故缺席或者连续 3 次未亲自出席董事会会议的，由董事会提请股东大会予以撤换”。而作为上市公司的独立董事，除了必须出席日常的董事会会议之外，还必须对企业的财务报告、重要事项进行审议，这些都要求独立董事一定时间精力的付出。此外，独立董事与企业所在地的距离也会给独立董事履行职责造成一定的麻烦。对于独

立董事个人来说，相对于异地相处，独立董事与公司处于同一地区可能具有获取信息和方便沟通的优势（谭劲松，2003），同时也可以减少履职的时间付出。显然，对于通常公务较为繁忙的独立董事来说，现实成本越大，其辞职的可能性越更大。

## （二）机会成本

作为理性的经济人，独立董事在上市公司任职应该是由利益驱动的，这种利益可以是物质的也可以是非物质的。而对独立董事来说，在一家公司任职意味着放弃或者减少在其他单位任职的机会，从而放弃或者减少在其他方面可以获得的利益，因此，独立董事任职成本中包括机会成本（Hermalin 和 Weisbach，2003）。尤其是在证监会规定了独立董事的任职家数的情况下，对“热度”较高的独立董事而言，如何在额度内（任职企业最多不超过5家）选择任职企业，机会成本更是成为其决策的重要因素。这种机会成本首先表现为各企业的独立董事津贴差异；其次表现为不同的企业带给独立董事的其他收入的不同<sup>7</sup>；最后表现为可能会放弃其他机会而做出的牺牲。尽管独立董事的激励向来是一个有争议的话题，但毫无疑问，包括津贴在内的上述机会收益构成了独立董事任职的重要激励来源，缺乏激励的独立董事是没有动力积极履行其应有的职责的。John Pound（1995，中译本2001）甚至认为，董事会成员必须有足够的激励，而且应将其收入与其服务挂钩，否则，不能指望他们会承担制定和质疑公司政策的重任。因此，由薪酬带来的机会成本将影响独立董事任职的激励水平，更高的机会成本，独立董事辞职的可能性更大。

## （三）风险成本

从成本是否现实发生的角度看，担任独立董事还可能存在着一些潜在的风险成本，这些成本并没有现实的发生，但是，企业可能存在某些行为和特征，使得独立董事在参与其中时，预期到未来的潜在威胁，它们构成了独立董事的风险成本。

独立董事任职的风险成本大体可以分为法律责任风险和声誉损失风险两大类。但归根到底，这些风险成本均来自于独立董事任职公司的治理风险，即独立董事在履职过程中参与企业经营决策、监督管理层的有效性和合法性程度。一方面，相关制度安排赋予独立董事独立地监督管理层经营决策、保护投资者利益的职责和权力以及相应的法律责任，但另一方面，国内外的实践表明，公司治理因素通常是独立董事无法有效或合法地行使其权利的根源，比如说，作为被监督者的 CEO 现实中常常是影响独立董事独立性的最大因素，他们可

<sup>7</sup> 比如说，不同的企业对企业界背景的独立董事来说可能有不同的企业发展资源，对中介背景的独立董事来说可能有不同的服务收益，对学者型独立董事来说可能有不同的增强实践和提高学术水平的机会，等等。

以通过影响独立董事的提名和薪酬确定过程而制约其独立性 (Hermalin and Weisbach, 1998, 2003), 在 CEO 具有相当的权力时, 即使出现某些重大不利情形, 董事会成员也很难提出反对意见从而有效发挥其监督作用 (Warther, 1998)。事实上, 企业各层级的治理结构 (如股权结构和董事会结构) 以及企业“关键人”的素质和行事风格, 都可能影响发挥其监督作用的有效性和合法性。与此同时, 独立董事的外部人特征和兼职特征导致的信息劣势和监督管层的非连续性, 也使得独立董事无法充分发挥其专业胜任能力 (谭劲松, 2003)。因此, 上述因素均可能诱发独立董事任职企业的治理风险问题, 公司治理风险越高, 从而独立董事面临的风险成本越高, 辞职的可能性就越大。

### 三、哪些独立董事更容易辞职？——对辞职独立董事个人特征的分析

虽然, 公司因素通常是上述各种任职成本发生和严重程度的直接原因, 独立董事辞职主要与公司因素有关, 但不可否认, 个人因素也在很大程度上制约了各种成本对独立董事的影响。事实上, 个人特征的差异可能导致独立董事对各种成本的不同评价和反应<sup>8</sup>。因此, 独立董事的辞职总是来自于其个人和所任职公司两个方面因素相互联系、相互补充的共同作用<sup>9</sup>。

基于这个考虑, 本文分别对两个相互联系的问题进行实证分析: 一是哪些独立董事更容易辞职? 二是独立董事更倾向于辞掉哪些公司? 通过第一个问题的回答, 可以大概了解辞职独立董事群体的若干重要特征, 从而合理估计个人因素对独立董事辞职的影响。而第二个问题则是在控制个人因素的影响之后, 找出影响独立董事辞职的公司因素。

为分析辞职独立董事的个人特征, 我们收集了 2001 年到 2004 年 3 月辞职的 190 个独立董事样本<sup>10</sup>。如表 1 所示, 辞职独立董事的个人特征与上市公司整体样本的相同特征表现出了较大的差异。

首先从职业背景看, 辞职独立董事中高校教师及科研人员占 36.36%, 实业界人士占 31.82%, 合计超过辞职独立董事的三分之二, 中介专业人士辞职

<sup>8</sup> 比如说, 不同职业背景、年龄的独立董事在空余时间的稀缺程度上可能会不同, 从而时间成本对他们的影响可能会不同; 同样的, 独立董事之间其他收入的不同也会导致薪酬的机会成本对独立董事的不同影响, 主业收入较高的独立董事可能会忽略薪酬的差距, 相反, 收入较少的独立董事可能会非常看重这种机会成本的大小。

<sup>9</sup> 虽然一些宏观政策也可能影响独立董事的辞职行为, 但是, 政策规定的最终落脚点总是在独立董事个人或者公司上, 从而分别构成个人因素和公司因素。

<sup>10</sup> 样本的具体情况和收集过程在后面的研究方法有详细介绍。

表 1 辞职独立董事的若干个人特征分析<sup>11</sup>

独立董事特征	分类标准	人数	比例 %	独立董事特征	分类标准	人数	比例 %
职业背景 (样本: 154)	高校教师、 科研人员	56	36.36	年龄 (样本: 170)	60 岁以上	17	10.00
	实业界人士	49	31.82		50-60 岁	25	14.71
	中介专业人士	25	16.23		50 岁以下	128	75.29
专业背景 (样本: 107)	其他	24	15.59	任期 (样本: 163)	1 年以内	49	30.01
	会计	18	16.82		1 年以上	114	69.99
	法律	18	16.82	任职家数 (样本: 190)	担任 1 家	133	70.00
	经济管理	56	48.60		担任 2 家	33	17.37
	技术	13	12.15		3 家或以上	24	12.63
职称 (样本: 112)	其他	2	5.61	学历 (样本: 142)	博士	51	35.92
	高级	96	85.71		硕士	44	30.99
地域特征 (样本: 167)	相同省市	16	14.29	本科	32	22.54	
	不同省市	97	58.09	其他	15	10.55	
独立董事人数 (样本: 180)	2 人或以内	84	46.67	独立董事比例 (样本: 180)	大于 1/3	65	36.11
	3 人或以上	96	53.33		其他	115	63.89

比例为 16.23%，结合谭劲松（2003）、上交所（2004）的统计<sup>12</sup>，上述三类人员担任独立董事占独立董事总数的比例分别为 39.52%、13.82%、23.42%（谭劲松，2003）和 45.83%、12.16%、19.45%（上交所，2004），

<sup>11</sup> 在表最后一行中，我们描述了辞职独立董事任职公司的独立董事总人数及其在董事会中的比例，这些特征严格来说不属于辞职独立董事的个人特征，但我们把它们列举出来是希望借此分析辞职独立董事在董事会中是否处于孤立的地位，从而大致判断独立董事作为一个群体在董事会中的发言权（感谢审稿人提醒关注这一问题）。此外，由于独立董事个人部分特征的信息无法获得，且不同特征之间数据缺失的情况不同，所以我们在统计这些特征时只能针对每个特征构造研究的样本数。

<sup>12</sup> 有关独立董事特征的统计资料，目前存在不同的口径。我们发现，尽管统计的时间和空间范围有所差异，但总体而言，有关指标所表现的问题都是相似的。本文选取谭劲松（2003）截至 2002 年 8 月 21 日沪深两市的数据统计和上交所（2004）截至 2003 年 9 月沪市的数据统计做为参照和对比。我们认为，上述两个统计总体而言反映了目前我国证券市场独立董事的基本特征，也与市场对我国独立董事制度的基本判断一致。因此，我们认为，本文的数据与上述两个统计是可比的。感谢匿名审稿人提醒我们对这一问题的关注。此外，谭劲松（2003）、上交所（2004）均把中介专业人士划分为律师、会计师和咨询顾问等三类，本文把他们综合作为一个指标“中介专业人士”来计算。

可以发现实业界人士辞职的比例远远超过其担任独立董事的比例，说明其辞职倾向更为明显，相对而言高校教师和中介专业人士的辞职倾向则没那么明显<sup>13</sup>。可能的解释是实业界人士自身事务繁忙、以及已有的收益使得独立董事收益吸引力偏弱，而且我国尚未形成企业之间相互担任独立董事的气候，因而从风险与收益配比的角度来看选择辞职，而高校教师及科研人员担任独立董事且辞职倾向不突出，可能有其从理论研究结合实际的角度考虑的因素，至于中介专业人士的行为，可能与其试图增大在业内的知名度和影响、以为其日后的业务开展带来好处等有关。

从专业构成来看，辞职独立董事的专业结构中以经济管理、会计和法律为主，合计超过82%，远远超过谭劲松（2003）的统计结果（43%）。可能的解释是这些独立董事更多的参与企业的重大经营和财务决策，对企业的经营风险和财务风险可能更为了解，相对于其他人士，风险意识也可能更强一些<sup>14</sup>。

从职称和学历来看，辞职独立董事中大部分具有高级职称和较高学历（硕士或以上），分别占85.71%和66.91%，超过各自的任职比例58.48%、47.14%（谭劲松，2003）和65.16%和57.15%（上交所，2004），可能是由于较高的学历和职称通常意味着更高的社会知名度，从而声誉风险成本在辞职独立董事中可能占据重要的地位。

从地域特征看，表中显示辞职独立董事中与公司不在同一省（市）的比例为58.09%，超过谭劲松（2003）统计的46.31%<sup>15</sup>，说明独立董事与公司相处异地及其带来的信息劣势和较大的履职费用可能会引发独立董事的辞职行为。

从年龄分布来看，50岁以下者占了辞职独立董事的75.29%，远远高于任职比例51.27%（谭劲松，2003），60岁以上者只占辞职独立董事的10%，远远低于任职比例20.98%（谭劲松，2003）。上交所（2004）的资料同样说明了这一点<sup>16</sup>。可能的解释，一是老同志的健康并不影响其工作的开展，且时

<sup>13</sup> 为了检验独立董事辞职样本和整体上市公司某些特征的差异是否具有统计显著性，我们对本文中所有涉及到辞职样本和整体样本特征比较的情况（包括辞职独立董事个人特征和独立董事辞职公司特征）都做了独立性卡方检验。结果表明，除了辞职独立董事和整体独立董事在“中介专业人士”这一特征上不能通过独立性检验之外，其他特征都通过了0.05甚至0.005水平的临界检验。为了节省篇幅，本文没有报告和分析具体的检验情况。感谢审稿人提醒我们注意这个问题。

<sup>14</sup> 我们认为，很多专业背景为会计、法律的独立董事其职业背景多为高校的教师，中介人士不占多数，因此，较高的财务、法律独立董事辞职和较少低中介独立董事辞职比例并不一定存在矛盾。

<sup>15</sup> 上交所（2004）没有该项统计数据。

<sup>16</sup> 上交所（2004）的统计数据表明，55岁以下的独立董事占68.99%，56岁以上的占31.01%。

间有保障，愿意发挥余热，同时可能对风险估计偏弱，二是中年人大多在职，而且能被聘为独立董事的往往都是成功人士，这些人基于收入状况、风险考虑、机会成本等原因更倾向于辞职。

从独立董事的任职家数来看，在 2 家或以上公司任职的独立董事辞职占独立董事辞职总人数的 30%，明显高于谭劲松（2003）的 14.33%<sup>17</sup>。由于多家任职意味着时间可能更为稀缺，同时特定企业的独立董事薪酬可能对独立董事影响不大，表明，现实成本和机会成本对独立董事辞职的影响程度可能不同。

从独立董事的任期来看，大部分独立董事都是在企业任职超过一年之后才辞职的，其比例达到了 70% 左右，未报告的结果表明，辞职独立董事平均任期为 13 个月，这说明，很多独立董事都是在对公司有一定的了解基础上才做出辞职决定的。

最后，在辞职独立董事任职的公司中，独立董事人数不超过 2 人的比例达到了 46.67%，远高于上交所（2004）的统计指标 30.73%。这在一定程度上说明，独立董事群体在董事会中的弱势地位可能会影响独立董事的发言权，从而导致其辞职，而辞职独立董事中，独立董事比例超过三分之一的公司仅占 36.11%，其他公司占 63.89%，从另一个侧面说明了这一点。

#### 四、哪些公司的独立董事在辞职？——对辞职公司特征的分析

针对“哪些公司的独立董事在辞职”这一主题，我们首先对所有独立董事辞职的公司进行描述性统计，并与上市公司的整体平均水平进行比较，从而找出这些公司的共性特征。而更有趣的问题是，一些独立董事在辞去一些公司独立董事职务的同时却又保留另外一些独立董事职务。这就给我们提出了一个有意思的问题，他们为什么会这样做？这些被辞职的公司具备何种特征？为此，本文选择同时担任多家独立董事在辞去了一些公司独立董事职务的同时却又继续担任其他公司独立董事职务的样本进行研究。

##### （一）独立董事辞职公司的若干特征分析

我们选取若干特征指标，对发生独立董事辞职的公司（共 154 个）进行简单的统计，得到表 2 如下。

从表 2A 和 2B 中，我们发现，对于某些表明公司可能出现问题的或者与独立董事任职风险联系较紧的若干特征，如公司被 ST、得到非标准意见的审计

<sup>17</sup> 上交所（2004）没有该项统计数据。而岳清唐（2003）对 500 家上市公司的 1044 个独立董事的研究发现，兼任 1 家或以上的独立董事占总数比例仅为 6.2%，指标值更低。



表 2 所有独立董事辞职公司的若干特征一览表  
表 2A

年份	被起诉 (%)		发生重大担保 (%) <sup>18</sup>		股票被 ST (%)		获得非标准 计意见 (%)		被公开谴责 (%)		发生重大关联 交易 (%) <sup>19</sup>	
	辞职 公司	全体 公司	辞职 公司	全体 公司	辞职 公司	全体 公司	辞职 公司	全体 公司	辞职 公司	全体 公司	辞职 公司	全体 公司
2001 年	12.76	18.13	31.91	-	8.51	5.20	17.02	12.28	8.51	6.45	65.96	55.25
2002 年	25.00	17.20	51.09	-	15.22	6.75	28.26	12.55	8.70	4.80	69.57	56.03
2003 年	30.00	11.26	53.33	40.24	40.00	10.62	53.33	7.65	20.00	3.67	80.00	51.52
全部	22.59	15.53	45.44	40.24	21.24	7.52	27.27	10.83	9.74	4.97	69.48	54.27

表 2B

年份	亏损 (%)		Eps (元)		总资产 (亿元)		资产负债率 (%)		开会次数 (次)		薪酬(万元) <sup>20</sup>	
	辞职 公司	全部 公司	辞职 公司	全部 公司	辞职 公司	全部 公司	辞职 公司	全部 公司	辞职 公司	全部 公司	辞职 公司	全部 公司
2001 年	10.64	11.40	0.02	0.13	17.18	26.86	54.43	46.24	7.32	6.18	2.61	1.17
2002 年	35.87	13.23	-0.01	0.09	19.56	34.59	53.33	49.09	7.56	8.02	3.25	3.14
2003 年	26.67	10.70	0.02	0.12	21.40	42.17	75.19	50.89	8.20	7.52	2.57	3.63

<sup>18</sup> 由于数据缺失，我们无法获得 2001 和 2002 两年整体上市公司的担保数据，只能以 2003 年的数据代替三年平均水平。  
<sup>19</sup> 这里，“重大关联交易”的标准是根据证监会的披露要求，必须在上市公司年度报告的重要事项中披露的重大关联交易事项。此外，我们没有统计关联交易金额占净资产的比例，主要是因为公司年报中披露的关联交易种类繁多并且相当部分公司没有披露交易的金额，无法进行计算。  
<sup>20</sup> 这里的独立董事薪酬数据来自郑珩(2004)：我国上市公司独立董事薪酬的决定：理论框架与实证分析。其中，该文中三年的样本公司数分别为 318 家、1087 家和 1207 家。

报告、被主管部门公开谴责或批评、陷入法律诉讼、发生重大担保和重大关联交易,以及陷入经营和财务困境等特征,均在不同程度上与上市公司整体水平存在差异,并且这些状况有逐年恶化的趋势。首先,独立董事辞职公司平均有 22.59% 被起诉,特别是在 2003 年,这个比例占到了将近三分之一,比同期的整体水平高出近两倍<sup>21</sup>。而辞职公司中得到非标意见的公司比例则由 2001 年的 17.02% 到 2002 年的 28.26% 再到 2003 年的 53.33%,明显高于上市公司整体水平。此外,辞职公司发生重大担保、陷入法律诉讼以及被监管部门处罚的比重也有相似的规律<sup>22</sup>。以上结果初步表明,独立董事辞职越来越受到公司风险因素的影响。究其原因,可能是由于近几年随着资本市场中会计舞弊等违法违规现象的频繁发生,包括独立董事在内的公司高层都受到了不同程度的惩罚,随着相关法律法规的陆续出台,独立董事预期地或实际发生的任职风险均越来越高,他们必须关注更多的关于企业风险的行为或特征,从而提高了独立董事对上述公司特征的敏感程度和厌恶程度。

其次,在表 2B 中,辞职公司发生亏损的比例较高,且有逐年上升的趋势,除了 2001 年之外,其他年度均高于上市公司整体水平,2002 年甚至有超过三分之一的辞职公司发生了亏损。从每股收益 Eps 来看<sup>23</sup>,辞职公司每股盈利接近于 0,远低于整体平均水平。从总资产规模来看,辞职公司平均规模较小,只有上市整体水平的一半规模。此外,辞职公司的资产负债率也稍高于整体平均水平。这些结果初步表明,公司的不良财务状况可能给独立董事带来一定的负面声誉影响,从而影响独立董事的辞职倾向。

最后,我们发现,辞职公司中表明独立董事任职时间成本的公司一年内董事会开会次数平均水平是 7.69 次,并且,开会次数随着年度变化有增多的趋势,而整体水平则是 7.24 次,除了 2002 年低于整体水平之外,其他两年都明显高出。此外,辞职公司中独立董事的薪酬水平在 2.5 万元到 3.3 万元之间,相对于整体水平,辞职公司的独立董事薪酬 2001 年较高、2002 持平,2003 年则较低<sup>24</sup>。

<sup>21</sup> 数据来源:根据 WIND.NET 万得资讯数据库计算得到,以下关于整体上市公司的数据,如不特别说明,所直接引用或计算用数据都来自万得资讯数据库。并且,计算整体上市公司的样本数分别为:2001 年 1114 家、2002 年 1186 家和 2003 年的 1252 家。

<sup>22</sup> 未报告的结果表明,上述重大事件涉及金额占净资产的比重也有一定的上升趋势,其中,担保金额占净资产的比例逐年上升一个百分点左右,而诉讼金额占公司净资产的比重从 2001 年的 11.29% 增加到 2003 年的 35.91%。

<sup>23</sup> 在计算 Eps 时,我们剔除了 Eps 小于 -1.0 元的公司,其中,2002 年 1 家(600053),2003 年 2 家(000621 和 000730)。

<sup>24</sup> 蒋义宏、吴志刚(2004)对沪市 A 股 455 家公司的研究表明,2002 年独立董事的平均津贴为 3.42 万元。

## (二) 变量设计

### 1、独立董事任职的现实成本

理论上说，工作时间虽然是衡量独立董事任职现实成本的最佳指标，但是由于难以观察和数据获取的困难，我们采用董事会开会的次数（Times）来衡量独立董事的工作时间，因为独立董事的工作时间通常都用来应付企业董事会相关议题的会前准备工作以及会中讨论和决议。Vafeas（1999）也指出，董事会会议次数可以用来作为一个替代变量来衡量董事的活动。此外，我们采用了虚拟变量 district 来代表独立董事个人住址和公司所在地之间的距离从而反映部分的独立董事履职成本。

### 2、独立董事任职的机会成本

独立董事任职的机会成本实际是指担任独立董事所放弃的其他机会的代价。由于资料来源的限制，我们无法获得这一资料。反过来，独立董事辞职，就是放弃了可能的机会收益，因之，独立董事在任职公司所获的报酬就成为其辞职的机会成本<sup>25</sup>。

### 3、独立董事任职的风险成本

公司治理因素对企业风险的影响通常体现为公司行为特征和某些状态特征两个相互联系的方面，考虑到独立董事对其公司治理风险的评价也可能基于这两个方面，因此，为了更好的替代公司治理风险及其带来的法律风险和声誉风险，我们分别设计了行为特征变量和表现特征变量两类变量。

首先，行为特征变量指的是公司在一定时期内反映公司治理风险的某些流量指标。对此，本文认为，无论是从公司业务的复杂性从而独立董事花费的时间精力，还是从独立董事面临的潜在风险来看，企业在一年发生重要事项的频率或者程度都是其良好的替代指标。其中，证监会要求企业在发生时以及定期报告中详细披露的重大担保（包括对外和对内）（Assure1 和 Assure2）、重大诉讼（仅限于被动的诉讼）（Trouble）和重大关联交易（Relation）等重要事项不但要求任职于企业的独立董事对此给予较大关注，而且在必要时还必须发表具有法律效力的独立意见。因此我们采用上述变量<sup>26</sup>来代表独立董事任职企业行为层面反映的公司治理风险。

<sup>25</sup> 感谢匿名审稿人针对这一问题提供的建议。

<sup>26</sup> 在这里，本文对上述重大事项和审计意见的衡量除了采用二元虚拟分类法，即用“是否发生重大事项和是否为非标准无保留意见”来衡量其程度之外，对于重大担保，由于其发生的次数并不一定代表其程度，发生的金额占企业资产的比例应该是更好的替代指标，因此，我们同时也采用了担保金额占总资产的比例来衡量，而由于对审计意见的各种类型赋以不同的分值可以更好的反映企业

其次，反映公司治理风险的状态特征变量可以分成两种，一是与企业表现直接相关的若干存量和流量指标；二是常用的治理结构变量。对于前者，我们使用了审计意见的严重程度 (Audit1 和 Audit2) 和是否处于财务困境 (Morass) 这三个变量来反映独立董事的风险。

在常用的治理结构变量中，由于公司控制权的制衡状况和内部人的控制程度在一定程度上代表了企业“关键人”对企业的控制程度，在一定程度上代表公司的治理风险，因此，本文采用了第一大股东持股比例与第 2 到 5 股东持股之和的比值 (Power)、企业董事长和总经理是否兼任 (Dualism)、独立董事的比例 (Director) 作为独立董事公司治理风险的替代指标。此外，公司高管是否发生变动也可能对独立董事的利益、在董事会中的地位以及对公司风险的评价产生影响，因此，我们也将将其作为衡量独立董事任职风险成本的变量<sup>27</sup>。

在控制变量的选择上，我们使用了常用的企业规模 (Size)、资产负债率 (Leverage) 和净资产收益率 (Roe1 和 Roe2) 三个变量。

表 3 各主要变量定义表

变量	定义
Resignation	=0，独立董事继续留任的公司；=1，独立董事辞职的公司
Remuneration	辞职前一年年末企业支付给独立董事的报酬。
Times	辞职前一年公司的董事会开会次数。
District	=0，公司与独立董事同处一省或直辖市；=1，其他情况。
Share1	第一大股东持股比例。
Power	第一大股东持股比例与第 2 到 5 股东持股比例总和的比值。
Dualism	=1，董事长和总经理为同一人；=0，其他情况。
Director	=1，如果独立董事占董事会人数达到或超过三分之一；=0，其他情况。
Change	=1，在独立董事辞职前半年内发生董事长或者总经理变更，=0，其他情况。
Assure1	=1，辞职前一年公司发生重大担保行为；=0，其他。
Assure2	辞职前一年公司担保的金额占当年总资产的比例。
Trouble	=1，辞职前一年公司发生重大被动诉讼行为；=0，其他情况。

财务报表被外界质疑的严重程度，所以我们也同时采用审计意见的多元分类法。至于重大关联交易，如前所述，由于企业一年内发生的重大关联交易种类繁多并且很多企业并没有详细或者确切的披露交易金额，因此，我们无法采用交易金额占总资产的比例进行衡量，最后，对于法律诉讼，理论上也可以采用诉讼金额占总资产或净资产的比例来进行衡量，但是前面的特征分析表明，陷入法律诉讼的企业并不占多数，因此并不适合采用比例变量。

<sup>27</sup> 感谢审稿人建议我们考虑公司高层变动对独立董事辞职的影响。

表 3 续

变量	定义
Relation	=1，辞职前一年公司发生重大关联交易；=0，其他。
Audit1	=0，辞职前一年审计意见为非标准无保留；=1，其他。
Audit2	=0，辞职前一年审计意见为非标准无保留；=1，无保留加解释性说明；=2，保留意见；=3，否定意见或拒绝表示意见。
Morass	=1，企业在独立董事辞职当年股票被特殊处理(ST)或者前年年末每股净资产为负值；=0，其他情况。
Roe1	辞职前一年年末企业的净资产收益率。
Roe2	=0，辞职前一年年末企业的净资产收益率大于0；=1，其他情况。
Lnsiz	辞职前一年年末企业总资产的自然对数。
Leverage	辞职前一年年末企业资产负债率。

### (三) 样本筛选

我们根据企业的年报收集了2000年、2001年、2002年、2003年末的独立董事名单，然后，进行年度间的对比，找出独立董事的非正常变动样本，然后结合公开获取的资料剔除了正常换届或者其他非辞职意外情况（如病故）的样本。此外，在收集辞职公司和留任公司的样本过程中，我们发现，有极少数公司（如000562和000685）同时既是独立董事辞职的公司又是其他独立董事辞职后留任的公司。对于这些公司，如果属于同一年度，则不符合我们的样本要求，予以剔除；如果两类公司属于不同年度，比如说，有个别公司2001年是独立董事辞职后留任的公司，但2003年却成为其他独立董事辞职的公司，这可能是公司特征在年度间发生变化而导致独立董事辞职，因此，我们仍然保留其在样本中。但总的来说，这种样本重合的情况极少，不影响本文的基本结论<sup>28</sup>。最后，我们得到了2001年10月—2004年3月发生独立董事辞职的有关数据如表4所示。上述样本和变量数据通过在万得资讯数据库、巨潮资讯网（www.cninfo.com）、金融界网(www.jrj.com.cn)获取。

表 4 各研究样本的分布情况

样本	2001	2002	2003	2004	合计
发生辞职行为的独立董事个人总样本	7	58	105	20	190
独立董事辞职后仍留任其他公司情形下的辞职公司样本	5	17	24	5	51
发生辞职行为的独立董事仍留任的公司样本	7	33	44	9	93

<sup>28</sup> 感谢匿名审稿人提醒我们指出这一问题。

#### (四) 描述性统计

我们首先对独立董事辞职公司与其留任公司的若干特征进行了均值 T 检验, 结果如表 5 所示, 辞职公司在 18 个特征变量中, 有 13 个显著的区别于留任公司, 这意味着, 这两类公司的确在某些重要特征上存在着较大的差别; 接着在对其中的虚拟解释变量分别与被解释变量建立交叉汇总表进行独立性卡方检验 (Pearson Chi-Square test) 中, 如表 6 所示, 除变量 Director 之外其他变量均被初步判定对独立董事的辞职有显著影响。具体来说:

1、两类公司在董事会开会次数 (Times) 和地域特征 (District) 都存在显著差别。其中, 辞职公司的平均董事会开会次数为 8.12 次, 高于留任公司的 6.88 次, 其差异在 0.000 的水平上显著。上交所 (2003) 的报告指出, 2001 年 60% 的上市公司平均开会次数在 4-7 次之间, 也为这一结果提供了支持。此外, 平均有 67% 的辞职公司中独立董事与公司不在同一省份或直辖市, 相比之下, 留任公司只有 46% 的异地比例, 两者的差异也十分显著。此外, 表 5 中显示 “District” 变量通过了独立性卡方检验。结合前面的个人特征分析, 可以初步断定, 现实成本因素可能是独立董事考虑辞职的一个方面。

2、独立董事在辞职公司获得的薪酬为 4.118 万元, 虽然低于留任公司的 4.324 万元, 但是差异不显著, 结合表 2 的数据, 可以初步断定, 薪酬虽然可能影响独立董事辞职的机会成本, 但不是独立董事辞职的主要原因。

3、辞职公司重大担保的概率和程度、陷入法律诉讼的概率和比例以及重大关联交易的概率都明显的高于留任公司, 其中很多变量的显著水平都在 1% 上, 表明辞职公司相对于留任公司更有可能是“问题企业”, 它们更可能经常处于不稳定和困难的经营状况、较高的经营风险以及麻烦的法律纠纷。卡方检验结果同时表明, 上述三个变量都对独立董事辞职有非常显著的影响 (P 值分别为 0.000、0.000 和 0.001)。因此, 在普遍规避法律风险和声誉风险的情况下, 我们预期独立董事可能由于预期公司上述特征给其带来法律风险的可能性更大而做出辞职决定。

4、表 5 显示, 无论采用二分类法还是四分类法, 辞职公司审计意见的严重程度均显著大于留任公司。同时, 与留任公司相比, 变量 “Morass” 和规模变量 “Size” 的 T 值均显著为正, 表明辞职公司更多为 ST 公司或者每股净资产已经为负值的“困难”企业。而对这一类公司, 注册会计师更倾向于出具非标准意见的审计报告。同时, 对上述部分变量的卡方检验表明, 它们都被初步判定为对独立董事辞职有显著影响。

5、大股东持股比例与第 2 到 5 股东持股比例之和的比值 Power 在两类公司中分别为 16.77% 和 18.18%, 留任公司稍微高于辞职公司, 但差别不显著, 独立董事比例 Director 的情形与此相似, 而总经理和董事长兼任的比例 Dualism 则辞职公司要高于后者, 但是达不到显著性水平。但是, 高管变动在

表 5 独立董事辞职公司与其留任公司的特征 T 检验<sup>29</sup>

变量	辞职公司 (n = 51)		留任公司 (n = 93)		T 检验	变量	辞职公司 (n = 51)		留任公司 (n = 93)		T 检验
	均值	均值	T 值				均值	均值	T 值		
Times	8.12	6.88	3.717***		Audit1	0.29	0.0538	3.504***			
District	0.67	0.46	2.417**		Audit2	0.53	0.0538	3.393***			
Power	16.77	18.18	0.833		Assure1	0.49	0.17	3.932***			
Dualism	0.20	0.0968	1.550		Assure2	0.0816	0.0085	2.001*			
Director	0.33	0.39	0.636		Trouble	0.33	0.0215	4.562***			
Change	0.37	0.20	2.096**		Relation	0.84	0.57	3.750***			
Morass	0.27	0.11	2.355**		Remuneration	4.118	4.324	-0.439			
Roe1	-1.80	6.91	1.963*		Leverage	0.5313	0.4710	1.112			
Roe2	0.18	0.0645	1.876*		Size	2.0E+10	3.2E+10	-1.762*			

注：\*\*\* 表示在 1% 的水平上显著、\*\* 表示在 5% 的水平上显著、\* 表示在 10% 的水平上显著。

表 6 各虚拟解释变量与因变量的独立性检验

	Pearson Chi-Square	自由度	显著性 (双尾)
Resignation * District	5.526	1	0.019
Resignation * Dualism	2.836	1	0.092
Resignation * Director	0.409	1	0.522
Resignation * Change	5.141	1	0.035
Resignation * Assure1	16.371	1	0.000
Resignation * Trouble	27.963	1	0.000
Resignation * Relation	11.066	1	0.001
Resignation * Audit1	15.910	1	0.000
Resignation * Morass	9.465	1	0.002
Resignation * Roe2	4.424	1	0.035

两类公司中存在着显著差异，辞职公司更可能发生高管的变动。在独立性卡方检验中，变量 Dualism 和 Change 都通过显著性检验。但总的来说，上述描述性统计表明，由公司治理的静态变量代表的风险成本可能不是影响独立董事辞职的重要因素。

<sup>29</sup> 在对两类公司进行 T 检验中，我们剔除了个别极端值的影响，如开会次数 Times 和 Roe1 等。

在控制变量方面，我们发现，独立董事辞职公司相对于留任公司规模较小，同时具有较高的资产负债率（但不显著）。此外，变量  $Roe1$  和  $Roe2T$  值分别显著为正和显著为负，表明辞职公司相对于留任公司盈利能力较差。

## (五) 回归分析

上述对两类公司若干特征的分析为我们认识独立董事辞职的公司影响因素提供了初步结果。需要进一步了解的是，上述因素中，哪些是影响独立董事辞职的最重要因素？它们是怎么影响独立董事辞职的？为此，我们建立如下二元 logistic 回归模型：

$$\begin{aligned} Ln &= \frac{p(\text{resignation})}{1-p(\text{resignation})} \\ &= \partial_0 + \partial_1 \text{remuneration} + \partial_2 \text{times} + \partial_3 \text{district} + \partial_4 \text{share1/power} + \partial_5 \text{dualism} + \partial_6 \text{director} \\ &\quad + \partial_7 \text{change} + \partial_8 \text{assure} + \partial_9 \text{trouble} + \partial_{10} \text{relation} + \partial_{11} \text{audit} + \partial_{12} \text{morass} + \partial_{13} \text{roe2} \\ &\quad + \partial_{14} \ln \text{size} + \partial_{15} \text{leverage} + \varepsilon \end{aligned}$$

模型中各变量的定义与前面一致，其中，由于审计意见和三个重大事项均有两个不同或以上的替代变量，总的来说，它们可以分为虚拟变量和离散变量两种，为了增强本文结论的可靠性，我们同时采用两类基本的回归模型。其中，第一类模型中采用上述指标的虚拟变量形式（如  $Audit1$ ），第二类模型中对重大担保和审计意见分别使用担保金额占总资产比重变量  $Assure2$  和多元分类审计意见变量  $Audit2$ ，其他变量均相同。

为了确保各变量之间不存在共线性问题，我们进行了 Pearson 相关系数检验，结果表明（未报告），各模型各变量之间的相关系数均小于 0.4，远低于通常使用 0.8 或 0.5 的判断标准，表明各变量应该不存在显著共线性问题。

我们使用了强制纳入变量法（Enter）进行 logistic 回归，如表 7 所示，两个模型的回归结果均表明，影响独立董事辞职的最主要因素是其担任独立董事的时间成本和由公司治理风险带来的法律风险成本和声誉风险成本，其中：

1、董事会开会次数和公司异地特征与独立董事辞职概率显著正相关。两个模型的结果均表明，董事会开会次数和地域特征均显著地影响独立董事的辞职，其显著性水平分别为 0.01 和 0.05，说明独立董事任职的现实成本是影响其辞职的重要因素。

2、用薪酬衡量的机会成本与独立董事辞职概率虽然与独立董事的辞职负相关，但是并不显著，从而本文关于机会成本与独立董事辞职关系的假设得不到有力支持。结合 T 检验和个人特征分析的结果，我们认为，一方面，独立董事薪酬的平均水平不高（4 万元左右），另一方面由于独立董事往往是社会名流和专业人才，其主业收入都比较丰厚，独立董事薪酬应该不会构成其收入的主要来源，从而不足以令独立董事对其产生依赖（谭劲松，2003）。因



表 7 独立董事辞职影响因素的回归结果：强制纳入法 (Enter)

解释变量	预期符号	模型 1		模型 2	
		系数	系数	系数	系数
常数项		-5.283 (0.641)	-5.305 (0.652)	-8.358 (1.550)	-8.294 (1.536)
Remuneration	-	-0.134 (1.567)	-0.131 (1.468)	-0.124 (1.439)	-0.119 (1.307)
Times	+	0.515*** (12.124)	0.508 (15.094)	0.549*** (17.244)	0.543*** (17.366)
District	+	1.214** (4.356)	1.176** (4.201)	1.229** (4.385)	1.187** (4.182)
Share1	+	0.010 (0.356)		0.011 (0.428)	
Power	+		0.001 (0.042)		0.003 (0.244)
Dualism	+	0.540 (0.558)	0.557 (0.593)	0.613 (0.694)	0.651 (0.781)
Director	-	-0.050 (0.008)	0.021 (0.001)	-0.025 (0.002)	0.041 (0.005)
Change	+	0.282 (0.217)	0.316 (0.273)	0.610 (0.982)	0.625 (1.025)
Assure	+	1.704*** (8.293)	1.700*** (8.249)	17.139** (6.379)	16.720** (6.402)
Trouble	+	2.452*** (6.621)	2.422*** (6.487)	2.332** (6.180)	2.310** (6.093)
Relation	+	1.417** (4.432)	1.528** (5.487)	1.235** (3.406)	1.315** (4.044)
Audit	+	1.689** (3.455)	1.661* (3.297)	1.479*** (4.096)	1.472** (4.048)
Morass	+	0.541 (0.248)	0.469 (0.182)	0.311 (0.073)	0.215 (0.034)
Roe2	+	-0.990 (0.532)	-0.940 (0.465)	-0.671 (0.211)	-0.588 (0.160)
Lnsiz	-	-0.071 (0.049)	-0.053 (0.028)	0.090 (0.075)	0.105 (0.104)
Leverage	+	-0.828 (0.564)	-0.791 (0.532)	-1.940 (1.454)	-1.926 (1.465)
Chi—square		82.991	82.676	86.288	86.101
— Log likelihood		104.205	104.521	100.909	101.096
Nagelkerke R square		0.602	0.600	0.62	0.619
模型识别正确率		84	84	84.7	84.7

注 1：\*\*\* 表示在 1% 的水平上显著、\*\* 表示在 5% 的水平上显著、\* 表示在 10% 的水平上显著。

注 2：模型 1 和模型 2 的差别在于 assure 和 audit 的取值不同，前者分别是 assure1 和 audit1，后者则分别是 assure2 和 audit2。

此，独立董事报酬不成为独立董事辞职的重要影响因素。同时也说明，薪酬可能不是衡量独立董事任职机会成本的最佳变量。

3、用企业重大事项和审计意见衡量的风险成本与独立董事辞职概率显著正相关。与预期相同，两个模型均表明，企业重大担保、重大诉讼和重大关联交易发生的频率（模型1）和程度（模型2）以及审计意见的严重程度均与独立董事辞职概率高度正相关。这表明，当企业较高频率的发生诸如重大担保、重大诉讼和重大关联交易等非经常性的重大事件以及会计报表和财务状况被外界严重质疑时，表明企业可能存在着较高的治理风险，独立董事风险厌恶的特性<sup>30</sup>使其存在规避法律风险的强烈动机。

最后，公司治理结构的几个常用替代变量，即第一大股东持股比例 $share1$ 和相对持股比例 $Power$ 、董事长和总经理的两职合一 $Dualism$ 、董事会中独立董事比例 $Director$ 以及高管变动 $Change$ 这四个变量虽然作用方向与预期一致，但都不能显著地影响独立董事的辞职。对此，我们认为，独立董事在决定是留任还是辞职时并未过多关注通常的公司治理指标，其中一个重要原因是独立董事的选拔机制。我国现行独立董事一般都是公司管理层或大股东选定后提交股东大会的，独立董事在任职前对公司治理的表面状况已有所了解，在他们看来，动态的行为特征变量可能比静态的特征变量更能反映公司治理风险。企业“关键人”的动态特征或者行事风格更可能影响独立董事面临的公司治理风险。Hermalin和Weisbach（2003）也认为，虽然CEO的影响可能是制约独立董事独立性的重要因素，但这种影响通常是无法观察到的（unobservable）。这表明，企业内部人对独立董事的影响更多的是一些动态的或者个性化的特征，事实上，一切可能影响独立董事和公司高层进行有效沟通进而发挥独立董事作用的因素都可能导致独立董事选择“愤然辞职”。即使在股东控制均衡、内部人控制程度较轻的企业，不同的高管做事风格和素质都可能导致独立董事对企业治理风险的不同评价。

从整体上看，上述两个模型的整体效果和拟合能力均达到令人满意的效果，其中，相当于线性回归分析中Adjust—R Square的Nagelkerke R Square分别达到了0.6和0.62，在二元logistic回归中，这样的拟合效果是相当不错的。从识别效力来看，两个模型整体的预测正确率分别为84%和84.7%，识别效力较好。此外，从模型1和模型2的比较来看，后者在整体效果和拟合能力上均要稍微优于前者，这表明，采用重大事项的发生次数来衡量其程度要稍微好过采用虚拟变量法，其原因可能是，即使都发生重大事项，辞职公司的

<sup>30</sup> 谭劲松（2003）认为，通常独立董事的报酬并不与企业业绩挂钩，在面临高风险高收益的决策时，由于高收益通常不属于独立董事，但由此可能产生的高风险却可能使独立董事声誉丧失甚至面临严峻的民事诉讼，同时，独立董事的“外部”和“兼职”的特点，也使得他们无法有效监督公司冒险活动的进行过程，因此，独立董事应该是一个风险厌恶者。

发生次数可能要高于留任公司，这样导致部分公司采用虚拟变量法无法区分两类公司的差别。

## （六）敏感性分析

由于模型 1 和模型 2 中变量较多，同时样本量较小，因此在强制纳入变量法（Enter）下可能无法得到影响独立董事辞职的最主要因素，从而影响结论的可靠性。基于这个考虑，我们对上述模型也使用条件参数法进行检验。具体来说，变量的进入方法改为逐步向前法（Forward），即变量一律根据比检验的概率大小依次进入方程，而变量移出方程则采用 Conditional 法，即依据条件参数似然比检验的结果删除变量，在 Forward：Conditional 方法下，在回归时可以根据各自变量加入分析能取得最大的模型卡方增量（即卡方检验最显著）的原则来加入新自变量，直至无法取得显著的变量为止，从而可以自动地筛选出显著的自变量。

如表 8 所示，在逐步条件参数法下，模型 1 和模型 2 的回归结果基本上和强制纳入法（Enter）相同，从而再次表明影响独立董事辞职的最主要因素是 Times、Audit、Relation、Trouble、Assure 和 District。唯一不同的地方在于，在逐步条件参数法下变量 Audit1 无法进入模型 1，而 Audit2 则是第 3 个进入模型 2 的自变量。对此，我们认为，其原因跟 Enter 法下 Audit2 比 Audit1 解释力更强的理由相同，即虽然辞职公司和留任公司可能同样获得非标准无保留审计意见，但其严重程度也可能在两类公司中存在差别（从两类公司审计意见的 T 检验可以看到），从而用多元分类变量更能反映这种差别。我们在模型 1 中用 Audit2 替代 Audit1，结果发现（未报告），Audit2 在条件参数法作为第三个显著变量进入了模型 1，在强制纳入变量法下显著性增强，并且两种方法下模型的拟合效果更好，从而证实了上述结论。

此外，我们对模型 1 和模型 2 的分别做了如下的敏感性测试：1、在模型 1 中分别单独用重大担保变量 Assure2 和审计意见变量 Audit2 代替 Assure1 和 Audit1；2、把担保变量 Assure2 改用担保金额占企业净资产的比例来替代；3、把两个模型中的盈利能力的虚拟变量 Roe2 均变成连续变量 Roe1；4、在模型 1 和模型 2 中把独立董事比例的虚拟变量 Director 改用连续变量表示。上述测试结果表明（未报告），模型的整体效果和其他变量的解释力几乎没有变化，替换后的变量跟替换前的变量具有相似的解释力，因此，回归模型的稳定性比较好。

表 8 独立董事辞职影响因素的回归结果：条件参数法 (Forward: Conditional)

解释变量	预期符号	模型 1	模型 2
		系数	系数
常数项		-6.697*** (28.647)	-6.843*** (30.230)
Times	+	0.471*** (14.938)	0.512*** (17.265)
District	+	1.324** (6.285)	1.135** (4.387)
Assure1	+	1.578*** (8.231)	
Assure2	+		16.396** (6.470)
Trouble	+	2.713*** (10.484)	2.230** (6.502)
Relation	+	1.385** (5.425)	1.344** (5.049)
Audit1	+		
Audit2	+		1.204* (3.549)
Chi—square		75.860	81.225
—2 Log likelihood		111.337	105.972
Nagelkerke R square		0.563	0.593
模型识别正确率		83.300	83.300

注 1：\*\*\* 表示在 1% 的水平上显著、\*\* 表示在 5% 的水平上显著、\* 表示在 10% 的水平上显著。

注 2：模型 1 中进入模型的自变量顺序为：Times、Trouble1、Assure1、District 和 Relation1；模型 2 中进入模型的自变量顺序为：Times、Trouble1、Audit2、Relation2、Assure2 和 District。

## 五、结论和局限性的讨论

### (一) 本文的主要发现

1、从个人特征来看，辞职独立董事的若干重大个人特征都与上市公司的整体平均水平存在较大的差异，相对于整体样本，辞职独立董事中有更多的实业界人士、财务和法律方面的专业人才、具有高职称高学历的高级人才，有更

多的独立董事与公司相处异地、任期通常都在一年以上以及兼任多家公司独立董事，此外，辞职独立董事中老年人比例不高。

2、从公司特征来看，相对于独立董事继续留任的公司，辞职公司表现出更多的董事会开会次数、更多的重大担保、法律诉讼和重大关联交易行为发生、更严重的审计意见和财务状况、更容易发生高管变动、规模较小以及更倾向于与独立董事不在同一省份。

3、进一步的回归分析发现，影响独立董事辞职的最重要因素是其担任独立董事所带来的现实成本和风险成本。其中，代表独立董事履职现实成本的董事会开会次数和独立董事地域特征、代表公司治理风险及其导致的法律风险成本和声誉风险成本的重大担保、重大诉讼、重大关联交易以及审计意见严重程度等变量均与独立董事辞职的概率显著正相关。此外，我们发现，虽然独立董事薪酬和几个常用的治理结构变量对独立董事的辞职有一定影响，但是其作用力不大。

## （二）本文的主要局限

由于本文在控制样本的选取上，与传统的研究方法不同，尽管具有前面提到的独特优势，但是，这种做法也带来了一个问题，即由于并不是所有的独立董事辞职后都会继续担任其他公司的独立董事，因此，我们未全面研究所有辞职的独立董事其辞职行为背后的真正原因。此外，由于统计方法的缺陷，本文没有对可能影响独立董事辞职的其他无形机会成本等因素进行统计检验，而如前所述，这些因素也可能是影响独立董事辞职的重要方面，所有这些主观和客观缺陷的存在都使得我们必须慎重对待本文得出的结论。

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## DETERMINANTS OF THE RESIGNATION OF INDEPENDENT DIRECTORS: A THEORETICAL FRAMEWORK AND EMPIRICAL STUDY<sup>1</sup>

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### ABSTRACT

This study classifies the costs of independent directors into three major categories, namely *immediate costs* (costs related to immediate efforts), *opportunity costs*, and *risk-related costs*, which affect the overall efficiency of independent directors in different ways. These costs in turn contribute to their decision to resign. Our results show first that the characteristics of independent directors are important factors influencing their resignation decisions; second, that immediate costs, proxied by the frequency of director meetings and the geographical implications for independent directors, are significantly correlated with their resignation decisions; and third, that risk-related costs, proxied by material events, also significantly correlate with the resignation decision. Director remuneration, however, does not significantly influence their decision to resign, nor does any evidence support the notion that the static characteristic of corporate governance is a key factor in such resignation decisions.

*Keywords:* Independent Director, Resignation, Cost, Individual Factor, Corporate Factor

<sup>1</sup> This paper is the interim result of research entitled "Accounting Control Study for Protecting Property Rights" sponsored by the National Natural Science Fund (No.70532003). The authors would like to thank Professor Feng Liu from the School of Business, Sun Yat-sen University. This paper was submitted to the Third International Symposium on Empirical Accounting Research (Nankai University, Tianjin, December 2004). We are also grateful to Professor Jevons Lee from Tsinghua University, Professor Bin Liu from Chongqing University, and other attending scholars who have provided valuable comments on this paper. Lastly, we would like to thank Professor Wayne W. Yu from the Hong Kong Polytechnic University and the anonymous referees of *China Accounting and Finance Review* for their very useful comments. The errors in this paper, if any, are our sole responsibility.

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## I. INTRODUCTION

The board of directors (the Board), which is vested with decision-making power, is considered the ultimate internal supervisor of a nexus of contracts within an enterprise (Fama, 1980; Fama and Jensen, 1983); it also plays an important role in corporate governance under traditional corporate governance theory. With the absence of a board of supervisors, the status and effect of independent directors on the Board is a vital aspect of its structure. After many years, independent directors have now become an integral part of worldwide corporate governance structures, as represented by the US and UK.

The inherent limitations of corporate governance in Chinese listed companies are two-fold. First, concentrated ownership is a common phenomenon. Second, the lack of investor protection in stated-owned enterprises leads to serious problems, such as the Board becoming a "rubber stamp" of the controlling shareholders. With the introduction of independent directors, both regulators and stock traders now hope that the levels of independence and supervision within the Board will be higher so as to enhance the quality of corporate governance and, in turn, better protect the interests of external shareholders. The China Securities Regulatory Commission (CSRC) promulgated "Guidelines for Introducing Independent Directors to the Board of Directors of Listed Companies" ("the Guidelines") in August 2001, and the independent director system was then fully implemented in all Chinese companies listed within or outside China.

During the implementation stage, certain independent directors submitted their resignation for a number of reasons. According to incomplete statistics,<sup>5</sup> from November 2001 to March 2004, 190 independent directors resigned in the Chinese stock market; of these, 7 cases occurred in the last two months of 2001, 58 cases in 2002, 105 cases in 2003, and 20 cases in the first three months of 2004. Still more interesting is that some of these independent directors continued to serve as independent directors for other companies. What factors contributed to their decision of whether or not to stay? This question is worth considering.

This paper is organised as follows: Section 2 sets out the analytical framework of the paper; Section 3 analyses the effects of individual factors on resignation; Section 4 considers the influence of corporate factors on resignation; and Section 5 discusses conclusions and the paper's limitations.

## II. THE COSTS OF INDEPENDENT DIRECTORS: A FRAMEWORK

Independent directors must weigh earnings against costs when making a decision to resign. In most cases, independent directors receive fixed earnings.<sup>6</sup> Before and

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<sup>5</sup> Although we cannot assure that the publicly accessible data are complete, our statistical method basically ensures that no material data are missing.

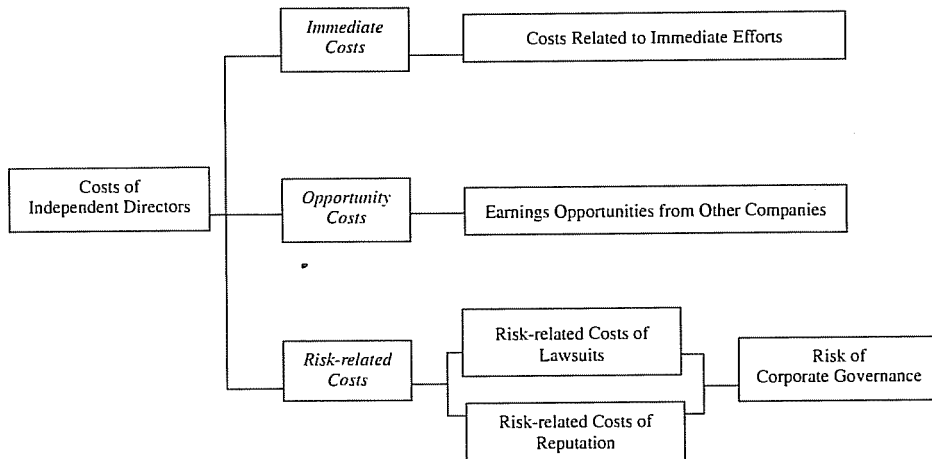
<sup>6</sup> Earnings of independent directors comprise both direct income derived from their serving companies and indirect income from other sources (Tan, 2003). While the former is relatively fixed in amount, the latter is relatively volatile.



after taking up their position, they continue to weigh their earnings against the costs incurred to decide whether to assume or resign from the post. Compared to earnings (especially material incentives), the costs incurred are relatively volatile and hence are difficult to accurately predict; they may then become the direct cause of an independent director's resignation.

Next, we consider from the perspective of costs what determines an independent director's decision to resign in terms of circumstances that are usually disadvantageous to an independent director. In Figure 1, the costs for independent directors are classified into three major categories, namely immediate costs (costs related to immediate efforts), opportunity costs, and risk-related costs, which affect the overall efficiency of independent directors in different ways. These costs in turn contribute to their decision to resign.

**Figure 1** Cost Analysis for Independent Directors



## 2.1 Immediate Costs

*Immediate costs* refers to all tangible and intangible costs of independent directors, in which the time and energy spent on the position form an integral part of these costs. The CSRC's Guidelines stipulate that independent directors "shall have enough time and energy to perform their duties effectively", and "If the independent director fails to attend the board meeting for two times consecutively without proper reasons and fails to attend the board meeting in person for three times consecutively, the board of directors may request at the shareholders' meeting to replace the director". Time and energy are also expended in other areas, such as deliberation of the company's financial reports or material events. Proximity to the serving company may enjoy the advantage of timely acquisition of relevant information (Tan,

2003). For busy independent directors, the higher the immediate costs, the higher the likelihood of their resignation.

## 2.2 Opportunity Costs

The decision to take up the office of independent director is driven by either material or non-material interests. Since serving one company implies giving up the opportunity to serve others and their related benefits, opportunity costs (Hermalin and Weisbach, 2003) should be included in the costs of independent directors. According to the Guidelines, independent directors can hold the post of independent director concurrently only in a maximum of five listed companies. As such, opportunity costs play a vital role in the decision-making process. These opportunity costs are represented by the differences between the independent directors' allowances and other income<sup>7</sup> among companies, as well as the sacrifice of other opportunities. Though controversial in nature, incentives for independent directors are important for motivating them to fulfil their responsibilities effectively. Pound (1995, Chinese version 2001) even maintains that, given the important role of Board members in formulating and challenging corporate policies, they must be adequately motivated by matching remuneration with performance. Therefore, the higher the opportunity costs, the greater the likelihood that an independent director will resign from his office.

## 2.3 Risk-related Costs

*Risk-related costs* refers to potential threats that are closely associated with certain practices and characteristics of the company. These costs can be generally classified into two main categories: costs of lawsuits and costs to reputation, which arise from either the risks of corporate governance or the degree of effectiveness and the legitimacy of independent directors in taking part in the decision-making process and supervising management. Much empirical evidence clearly demonstrates that corporate governance factors explain why independent directors fail to exercise their rights effectively and legitimately.

For instance, CEOs, as the supervisees of the directors, play a key role in influencing the independence of directors by way of nomination and setting of remuneration (Hermalin and Weisbach, 1998, 2003). At times, CEOs are so influential that it is unlikely the Board members will raise any objections, even under highly unfavourable circumstances. As a result, the Board fails to effectively supervise the CEO (Warther, 1998). In fact, all levels of governance structure (like ownership structure and Board structure) in a company and the quality of the "key man" may affect the effectiveness and legitimacy of the supervision. Information asym-

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<sup>7</sup> For instance, independent directors with an enterprise background have different developmental resources; independent directors with an agency background may have different service earnings; and independent directors with an academic background may have different opportunities to enhance their academic level.

metry and discontinuity in management supervision resulting from the outsider status and part-time nature of independent directors also impose limitations on their professionalism (Tan, 2003). As such, the higher the corporate governance risks, the higher the risk-related costs for independent directors, and the greater the likelihood of their resignation.

### III. ANALYSIS OF INDIVIDUAL CHARACTERISTICS OF INDEPENDENT DIRECTORS

Though the resignation of independent directors is undeniably closely related to corporate factors, differences in the background of directors may also lead to differences in evaluating and responding to various costs.<sup>8</sup> Individual and corporate factors are therefore both interrelated and complementary.<sup>9</sup> To gain a better understanding of both individual and corporate factors, we need to know what kind of independent directors are prone to resignation and from what kind of companies independent directors tend to resign.

To analyse the background of independent directors, we collected a sample of 190 cases of independent directors who resigned between 2001 and March 2004.<sup>10</sup> Table 1 shows a rather significant disparity between the background of individual independent directors who resign and all independent directors in the full sample.

As far as profession is concerned, academic staff and researchers as well as businessmen account for 36.36 per cent and 31.82 per cent of the sample respectively, which exceeds two thirds of all independent directors who resign overall, while the ratio for agents is 16.23 per cent. The percentages of the above three categories of independent directors account for 39.52 per cent, 13.82 per cent, and 23.42 per cent (Tan, 2003), and 45.83 per cent, 12.16 per cent, and 19.45 per cent (Shanghai Stock Exchange, 2004) respectively of the total number of independent directors after incorporating the statistics from Tan (2003) and the Shanghai Stock Exchange (SHSE) (2004).<sup>11</sup> The findings show that businessmen have a greater tendency to resign than

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<sup>8</sup> Both the time costs and remuneration-related opportunity costs have a different impact on independent directors. The former varies with factors such as the job nature and the age of independent directors, whereas the latter varies with the income level of their full-time job.

<sup>9</sup> Although macroeconomic policies, to a certain extent, affect the resignation decision of independent directors, these policies nonetheless focus on either independent directors or companies, thereby constituting separate individual and corporate factors.

<sup>10</sup> Please refer to the latter discussion on research method for details of the data collection process and sample-related issues.

<sup>11</sup> We compare our data with Tan's (2003) data of the SHSE and the Shenzhen Stock Exchange ending on 21 August 2002, and the SHSE's (2004) data ending in September 2003. We consider these two sets of data to generally reflect the basic features of independent directors in the Chinese stock market, and to be consistent with the basic market judgement on the independent director system. Therefore, these two sets of data and our data are comparable (we appreciate the anonymous referees for reminding us of this problem). Moreover, Tan (2003) and the SHSE (2004) both classify agents into lawyers, accountants, and consultants; we group them all as "agents" here.

**Table 1** Analysis of the Individual Characteristics of Independent Directors Who Resign<sup>12</sup>

Characteristics of Independent Directors	Classification	No.	%	Characteristics of Independent Directors	Classification	No.	%
Profession (Sample: 154)	Academic staff, Researchers	56	36.36	Age (Sample: 170)	Over 60	17	10.00
	Businessmen	49	31.82	Tenure (Sample: 163)	50-60	25	14.71
	Agents	25	16.23	No. of Firms Served	Under 50	128	75.29
	Others	24	15.59	Concurrently as Independent Directors	Less than 1 year	49	30.01
	Accounting	18	16.82	(Sample: 190)	1 year or more	114	69.99
	Law	18	16.82	Academic	1	133	70.00
	Business	56	48.60	Qualifications (Sample: 142)	2	33	17.37
	Administration	13	12.15	Percentage of Independent Directors	3 or more	24	12.63
	Technology	2	5.61	(Sample: 180)	PhD	51	35.92
	Others	96	85.71		Master's	44	30.99
Position (Sample: 112)	Senior Position	16	14.29		Bachelor's	32	22.54
	Others	70	41.91		Others	15	10.55
Geographical Implications— Relative to the Firm (Sample: 167)	Of the Same Province	70	41.91		More than 1/3	65	36.11
	Of Different Province	97	58.09		Others	115	63.89
No. of Independent Directors (Sample: 180)	2 or fewer	84	46.67				
	3 or more	96	53.33				

<sup>12</sup> The number and percentage of independent directors on a Board are analysed if the independent directors, as a group, have a say on the Board (we thank the referees for reminding us of this point). Also, the full sample is characteristic-specific due to the unavailability of certain data.

do academic staff and researchers.<sup>13</sup> One possible explanation for this is that the risks involved for the businessmen serving as independent directors are higher than their earnings in the position, while academic staff and researchers consider the resignation from a more practical point of view. Agents, on the other hand, may expect the office of independent director to help enhance their reputation and influence in the industry, which in turn may help develop their business.

In terms of professional background, more than 82 per cent of independent directors who resign have a business administration, accounting, or legal background, far greater than the statistical result (43 per cent) obtained by Tan (2003). This may be due to their stronger awareness of risk, since they have a better understanding of both the management and financial risks faced by a corporation through their involvement in important management and financial decisions.<sup>14</sup>

In terms of position and academic qualifications, most independent directors who resign hold senior ranks and are relatively better educated (master's or above), or 85.71 per cent and 66.91 per cent respectively, which exceeds their serving ratio of 58.48 per cent and 47.14 per cent (Tan, 2003), and 65.16 per cent and 57.15 per cent (SHSE, 2004) respectively. This may be because independent directors with higher rank and qualifications usually enjoy greater recognition in society. As a result, reputational costs may become an important consideration in whether or not to resign for these directors.

In terms of geographical implications, Table 1 shows that 58.09 per cent of independent directors who resign do not reside in the same province where the company is located, exceeding the 46.31 per cent<sup>15</sup> recorded by Tan (2003). Information asymmetry and the relatively higher costs for workplace distance explain their resignation.

In terms of age, 75.29 per cent of independent directors who resign are younger than 50 years, which is far higher than the serving ratio of 51.27 per cent (Tan, 2003). Another 10 per cent are over 60, which is far lower than the serving ratio of 20.98 per cent (Tan, 2003). The information from the SHSE (2004) also testifies to this point.<sup>16</sup> There are two possible explanations for this result: first, those who are older with lower anticipations of risk are physically more viable and capable of

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<sup>13</sup> To test if the difference in characteristics between the resigning sample and the full sample of independent directors of listed companies is statistically significant, we conduct a Pearson chi-square test on all comparisons between these samples (including both the individual characteristics and corporate characteristics). The results show that all characteristics pass the critical test at the level of 0.05, and even 0.005, except for the agencies characteristic, which in all samples do not pass the test. For simplicity's sake, the paper does not give a detailed report and analysis of the test. Again, we appreciate the anonymous referees for reminding us of this problem.

<sup>14</sup> Most of the independent directors who have an accounting or legal professional background are academic staff by profession. It is therefore not necessarily a conflict to have a higher resignation ratio of independent directors who have an accounting or legal background, and a lower resignation ratio of independent directors who are agents.

<sup>15</sup> No such data are available in SHSE (2004).

<sup>16</sup> According to the SHSE's (2004) data, independent directors aged under 55 and over 56 account for 68.99 per cent and 31.01 per cent respectively.

devoting more time to serving as independent directors; and second, most of the middle-aged independent directors are successful businessmen, who tend to resign after considering their income and risk levels and the opportunity costs incurred.

In terms of the number of firms served concurrently as independent directors, those who work for more than two companies account for 30 per cent of the total resignations of independent directors, which is far higher than the 14.33 per cent<sup>17</sup> of Tan's (2003) data. Since the time spent serving as independent director negatively correlates with the number of firms served as independent director, and since independent directors' remuneration from certain businesses does not have much influence on these directors, the impact of immediate and opportunity costs on their resignation may thus differ.

In terms of tenure, most directors, or almost 70 per cent, resign after serving in office for more than a year. An unreported result indicates that the average tenure of resigned directors is 13 months, which demonstrates that they make the decision to resign after they have gained a basic understanding of the corporation.

Finally, for those companies whose independent directors choose to resign, 46.67 per cent have no more than two independent directors, which is much higher than the SHSE's (2004) data of 30.73 per cent. To a certain extent, this shows that the inferior status of the independent directors on the Board may affect their right to speak, which in turn leads to their resignation. We can also look at this from another angle: when the percentage of independent directors on the Board is greater than one third, only 36.11 per cent choose to resign.

#### **IV. ANALYSIS OF COMPANY CHARACTERISTICS**

Descriptive statistics are calculated on all companies whose independent directors resign from their office and are compared with the full sample to identify common characteristics among all companies. Of interest is that certain independent directors resign from their position in certain companies but continue to serve as independent directors for other companies; this is the focus of this section.

##### **4.1 Analysis of Characteristics of Companies With Independent Directors Who Have Resigned**

Simple statistics are calculated on companies with independent directors who resign (a total of 154 companies) using a number of characteristic indexes; results are shown in Table 2.

In Tables 2A and 2B, we find characteristics that show that a company may be having problems or that may be more closely related to the risks undertaken by independent directors; these include the company being under ST, having non-standard audit opinions, being publicly condemned by regulators, facing prosecution,

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<sup>17</sup> No such data are available for the SHSE (2004). According to Yue's (2003) study on 1,044 independent directors from 500 listed companies, only 6.2 per cent of independent directors serve one or more companies out of the full sample.

**Table 2** Company Characteristics with Independent Directors Who Resign  
Table 2A

Year	Being Prosecuted (%)		Occurrence of Material Hypothecations (%) <sup>18</sup>		Under ST (%)		Receiving Non-standard Audit Opinions (%)		Being Publicly Condemned (%)		Occurrence of Material Related-party Transactions (%) <sup>19</sup>	
	resigned	total	resigned	total	resigned	total	resigned	total	resigned	total	resigned	total
2001	12.76	18.13	31.91	-	8.51	5.20	17.02	12.28	8.51	6.45	65.96	55.25
2002	25.00	17.20	51.09	-	15.22	6.75	28.26	12.55	8.70	4.80	69.57	56.03
2003	30.00	11.26	53.33	40.24	40.00	10.62	53.33	7.65	20.00	3.67	80.00	51.52
Total	22.59	15.53	45.44	40.24	21.24	7.52	27.27	10.83	9.74	4.97	69.48	54.27

Table 2B

Year	Loss (%)		EPS (RMB)		Total Assets (RMB100M)		Assets/Liabilities Ratio (%)		Meeting Frequency (Times)		Remuneration (RMB10,000) <sup>20</sup>	
	resigned	total	resigned	total	resigned	total	resigned	total	resigned	total	resigned	total
2001	10.64	11.40	0.02	0.13	17.18	26.86	54.43	46.24	7.32	6.18	2.61	1.17
2002	35.87	13.23	-0.01	0.09	19.56	34.59	53.33	49.09	7.56	8.02	3.25	3.14
2003	26.67	10.70	0.02	0.12	21.40	42.17	75.19	50.89	8.20	7.52	2.57	3.63

<sup>18</sup> Due to missing data, we are unable to obtain hypothecation data for all listed companies in 2001 and 2002; we thus replace them with the 2003 data.

<sup>19</sup> "Material related-party transactions" refers to transactions that must be disclosed in the annual report as requested by the CSRC's disclosure requirement. We do not and cannot compute the ratio of the number of related-party transactions to net assets since the annual reports list numerous sorts of such transactions with the numbers largely unspecified.

<sup>20</sup> The remuneration data of independent directors come from Heng Zheng (2004): Determinants of the Remuneration of Independent Directors in China: Theoretical Framework and Empirical Study. The number of sample companies in the three years as mentioned in the text is 318, 1,087, and 1,207 respectively.

and suffering from managerial and financial problems. These companies differ from the full sample and are deteriorating year by year.

First, for companies with independent directors who resign, the average ratio for prosecution is 22.59 per cent; this ratio rises to almost one third in 2003, twice as large as for the full sample compared to the same period.<sup>21</sup> The ratio of companies receiving non-standard audit opinions rises from 17.02 per cent in 2001 to 28.26 per cent in 2002, and even 53.33 per cent in 2003, which is significantly higher than in the full sample. The same trend also applies to instances of prosecution or public condemnation by regulators.<sup>22</sup> All these factors illustrate that the resignation of independent directors is increasingly being influenced by corporate risks. This may be because top management, including independent directors, have been punished for accounting fraud in the capital market in recent years. Since the introduction of related laws and regulations has increased the risk of serving as an independent director, they now have greater concerns about the risk-associated behaviours and characteristics of the corporation, hence increasing their sensitivity to these corporate-specific characteristics.

Second, in Table 2B, the ratio of loss-suffering companies with independent directors who resign is relatively higher than in the full sample; this ratio rises in every year except 2001. In 2002, the ratio even rises to over one third. The EPS<sup>23</sup> of companies with directors who resign is close to 0, far lower than that of the full sample. In terms of total assets, the average scale of companies with directors who resign is only about half that of the full sample, whereas the assets/liabilities ratio is slightly higher than in the full sample. This result shows that a company's unfavourable financial condition may have a negative influence on an independent director's reputation and in turn influence his resignation decision.

The annual average number of board meetings of firms with directors who resign is 7.69, compared to the full sample's of 7.24. The frequency of the former also increases over the years. Except in 2002, the frequency of board meetings in all other years is significantly higher than that of the full sample. In addition, the remuneration level of resigned independent directors ranges from RMB25,000 to RMB33,000; this level is mixed compared to that of the full sample.<sup>24</sup>

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<sup>21</sup> Data source: WIND.NET. All directly cited data in this paper come from WIND.NET if not otherwise specified. The number of the full sample is 1,114 in 2001, 1,186 in 2002, and 1,252 in 2003.

<sup>22</sup> The unreported results show that the percentage of material event-related numbers to net assets is steadily increasing. Among them, the ratio of hypothecation rises at a yearly rate of around 1 per cent, while the prosecution ratio rose from 11.29 per cent in 2001 to 35.91 per cent in 2003.

<sup>23</sup> When calculating the EPS, we eliminate companies whose EPS is less than RMB-1.0. As such, we eliminate 1 firm in 2002 (600053), and 2 firms in 2003 (000621 and 000730).

<sup>24</sup> Jiang and Wu (2004) have conducted a study on 455 A-share companies listed on the SHSE. The results show that the average allowance of independent directors was RMB34,200 in 2002.



## 4.2 Design of Variables

### 4.2.1 Immediate Costs

Though the time spent on work is the best indicator in judging the immediate costs of serving as an independent director, it is not an easy factor to observe, nor is the necessary information easily obtained. Instead we use the frequency of board meetings (*Times*) to measure the working time of independent directors, whose working time is always devoted to preparing for and attending the meetings. Vafeas (1999) also points out that *Times* can be used as a substitute variable to substitute the activities of independent directors. We also introduce a dummy variable "*District*" to represent the distance between the residence of independent directors and the location of the company to reflect part of the costs independent directors incur.

### 4.2.2 Opportunity Costs

Opportunity costs are the costs of giving up other opportunities by serving as independent directors. We are unable to obtain this information because of limited resources. Conversely, the resignation of independent directors means abandoning potential opportunity earnings; therefore, we use the remuneration of independent directors as the opportunity costs of their resignation.<sup>25</sup>

### 4.2.3 Risk-related Costs

The influence of corporate governance factors on corporate risks is usually demonstrated by the mutually affected characteristics of corporate behaviour and other status characteristics; independent directors may also consider these characteristics to assess their corporate governance risks, which can lead to both legal and reputational risks. We thus design two kinds of variables: those of behavioural characteristics and those of representing characteristics.

First of all, *behavioural variables* refers to certain current indexes that reflect corporate governance risks over a certain period of time. The time and energy spent by independent directors, or the potential risks faced by them, and the frequency and the degree of material events taking place in a company within a year's time are good examples of substitute indexes. The CSRC requests independent directors to not only pay more attention to material events, such as material internal and external hypothecations (*Assure 1 and Assure 2*), material passive lawsuits (*Trouble*), and material related-party transactions (*Relation*), but also to give independent opinions with legal force whenever necessary. We therefore use the above variables<sup>26</sup> to represent the corporate risks based on the company's behaviour.

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<sup>25</sup> We appreciate the advice given by the anonymous referees on this topic.

<sup>26</sup> In this paper, the two-dimensional dummy classification method is used to judge whether the above events are material and whether the audit opinions are non-standard unqualified ones. For material hypothecations, we use the ratio of the number of hypothecations to total assets for assessment. Also, we use the multi-dimensional classification on audit opinions. For material related-party transactions, we cannot use the transaction number to total assets for assessment due to the many kinds of material related-party transactions, plus many

Second, status variables that reflect corporate governance risks can be classified into two categories: first, the current and deposited indexes that are directly related to a company's performance; and second, the common variables of governance structure. For the former, we use the degree of severity of audit opinions (*Audit 1 and Audit 2*) and whether the company is having financial difficulties (*Morass*) to reflect the risks to independent directors.

With respect to the common variables of governance structure, because the balance of controlling rights of a company and the degree of insider control represent the degree of control by the company's key man and the risks of corporate governance to a certain extent, this paper uses the ratio of the shareholdings of the largest shareholder to the sum of the shareholdings from the second to the fifth largest shareholders (*Power*), the dual identity of the chairperson of the Board as the CEO of the company (*Dualism*), and the ratio of independent directors (*Director*) as the substitute indexes of the corporate governance risk of independent directors. Moreover, changes in top management may influence the interest and the status of independent directors, as well as their evaluation of corporate risks; therefore, all these are used to judge the risk-related costs of independent directors.<sup>27</sup>

For controlling variables, we use three commonly used variables: the scale of companies (*Size*), the assets/liabilities ratio (*Leverage*), and the ROE (Roe 1 and Roe 2).

**Table 3** Definition of Variables

Variables	Definition
Resignation	= 0 for those companies whose independent directors choose to continue to serve; =1 for those companies whose independent directors choose to resign.
Remuneration	The remuneration paid by the company to independent directors at the end of the year prior to their resignation.
Times	The number of times board meetings meet one year before an independent director resigns.
District	= 0 when both independent directors and their serving companies reside in the same province; = 1 otherwise.
Share1	The shareholdings of the largest shareholder.
Power	The ratio of the shareholdings of the largest shareholder to the sum of the shareholdings of the second to the fifth largest shareholders.
Dualism	= 1 when the chairperson of the Board and CEO of the company is the same person; = 0 otherwise.
Director	= 1 when the ratio of independent directors on the Board is 1/3 or more; = 0 otherwise.

companies have not specified the exact amount. Lastly, with respect to lawsuits, we can theoretically use the ratio of the amount spent on lawsuits to total assets or net assets for assessment, but because the former characteristic analysis has already shown that the number of companies facing lawsuits is insignificant, we do not use this ratio for assessment.

<sup>27</sup> We appreciate the anonymous referees for suggesting that we consider the impact of changes in top management on the resignation of independent directors.

**Table 3** *Continued*

Variables	Definition
Change	= 1 when there is a change in the chairperson of the Board or CEO half a year before the independent director resigns; = 0 otherwise.
Assure1	= 1 when there is a material hypothecation one year before the independent director resigns; = 0 otherwise.
Assure2	The ratio of the number of hypothecations to the year's total assets one year before the independent director resigns.
Trouble	= 1 when there is a material lawsuit one year before the independent director resigns; = 0 otherwise.
Relation	= 1 where there is a material related-party transaction one year before the independent director resigns; = 0 otherwise.
Audit1	= 0 when audit opinions are modified one year before the independent director resigns; = 1 otherwise.
Audit2	= 0 when there is a non-standard unqualified audit opinion one year before the independent director resigns; = 1 when there are non-standard opinions with explanatory notes; = 2 when there are qualified opinions; = 3 when there are negative opinions or a disclaimer of opinions.
Morass	= 1 when a company is specially treated in the year that the independent director resigns or when the Equity Per Share is negative at the end year prior to the independent director's resignation; = 0 otherwise.
Roe1	ROE at the end of the year prior to the independent director's resignation.
Roe2	= 0 when the ROE at the end of the year prior to the independent director's resignation is greater than 0; = 1 otherwise.
Lnsiz	The natural logarithm of total assets at the end of the year prior to the independent director's resignation.
Leverage	The assets/liabilities ratio at the end of the year prior to the independent director's resignation.

### 4.3 Sample Selection

We collect the name list of independent directors in 2001, 2002, and 2003 according to company annual reports, compare them between years to determine the sample of an abnormal change of independent directors, and then consolidate the above information with public information after eliminating samples of changes in office holders upon the end of tenure or other non-resignation-related incident (such as death). We also eliminate a very few companies (such as 000562 and 000685) where some independent directors choose to stay while others choose to go all within the same year, but we retain those samples if the independent directors come and go in different years. This will not affect our basic conclusion<sup>28</sup> since such cases are very

<sup>28</sup> We appreciate the anonymous referees for reminding us to pay attention to this problem.

**Table 4** Distribution of Research Samples

Sample	2001	2002	2003	2004	Total
Total Individual Sample of Independent Directors Who Resign	7	58	105	20	190
Company Sample with Independent Directors Who Resign but Choose to Continue to Serve as Independent Directors for Other Companies	5	17	24	5	51
Company Sample with Independent Directors Resigning from the Office of Independent Director of Other Companies	7	33	44	9	93

rare. Finally, we obtain the data from October 2001 to March 2004 which is shown in Table 4. The above sample and variable data come from WIND.NET, www.cninfo.com, and www.jrj.com.cn.

#### 4.4 Descriptive Statistics

After conducting a T test on certain characteristics of director-resigning companies (companies with independent directors who resign) and director-retaining companies (companies with independent directors who choose to retain their office) with the results shown in Table 5, we find that 13 of the 18 characteristic variables of the director-resigning companies show significant differences from the director-retaining companies. We further conduct a Pearson chi-square test on dummy and dependent variables to establish the interactive table shown in Table 6; we find that except for Director, all other variables have a significant influence on the resignation of independent directors.

4.4.1 The characteristics of *Times* and *District* show significant differences between both types of companies. The average number of board meetings of the director-resigning companies is 8.12, which is higher than the 6.88 of the director-retaining companies, with a difference significant at the 0.000 level. According to the SHSE's (2003) report, 60 per cent of the listed companies in 2001 had an average number of board meetings between 4 and 7, which also supports our conclusion. Of the director-resigning companies, 67 per cent are not in the same province as their independent directors, compared with only 46 per cent of the director-retaining companies; the difference is significant. Table 4 shows that *District* passes the Pearson chi-square test. From this and the former analysis on individual characteristics, we may initially conclude that immediate costs may be one consideration behind the resignation of independent directors.

4.4.2 The remuneration of independent directors in the director-resigning companies is RMB41,180, which is slightly lower than the RMB43,240 of the director-retaining companies. Taking the data in Table 2 into consideration, although remuneration may affect the opportunity costs of resignation, it is not the major reason for the resignation of independent directors.

**Table 5** T Test of Characteristics of Director-resigning and Director-retaining Companies<sup>29</sup>

Variables	Director-resigning companies (n = 51)	Director-retaining companies (n = 93)	Variables	Director-resigning companies (n = 51)	Director-retaining companies (n = 93)	T Test
	Mean	Mean		Mean	Mean	T-Value
Times	8.1200	6.8800	Audit1	0.2900	0.0538	3.504***
District	0.6700	0.4600	Audit2	0.5300	0.0538	3.393***
Power	16.7700	18.1800	Assure1	0.4900	0.1700	3.932***
Dualism	0.2000	0.0968	Assure2	0.0816	0.0085	2.001*
Director	0.3300	0.3900	Trouble	0.3300	0.0215	4.562***
Change	0.3700	0.2000	Relation	0.8400	0.5700	3.750***
Morass	0.2700	0.1100	Remuneration	4.1180	4.3240	-0.439
Roe1	-1.8000	6.9100	Leverage	0.5313	0.4710	1.112
Roe2	0.1800	0.0645	Size	2.0E+10	3.2E+10	-1.762*

Notes: \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively.

<sup>29</sup> During the T test on both types of companies, we eliminate the influence of some outliers such as Times and Roe1.

4.4.3 The probability and the degree of material hypothecations, the probability and the ratio of lawsuits, and the probability of material related-party transactions in the director-resigning companies are all significantly higher than those of the director-retaining companies, and many variables are significant at more than the 1 per cent level; these results all show that the director-resigning companies may be more problematic than the director-retaining companies; the former are more unstable, with higher business risks and troublesome lawsuits. The results of the Pearson chi-square test show that the above variables have a significant influence on the resignation of independent directors (0.000, 0.000, and 0.001 of P value). Independent directors may decide to resign to avoid both legal and reputational risks.

4.4.4 Table 5 shows that, whether the classification is two-dimensional or four-dimensional, the degree of severity of audit opinions for the director-resigning companies is significantly higher than for the director-retaining companies. Also, the T values of the variables *Morass* and *Size* of the director-resigning companies are all significantly more positive than those of the director-retaining companies, showing that the director-resigning companies are more likely to be under special treatment or in trouble with negative assets per equity; the CPA will normally issue a non-standard audit report for these companies. The Pearson chi-square test results for the above variables demonstrate that they all have a significant influence on the resignation of independent directors.

4.4.5 The ratio of the shareholdings of the largest shareholder to the sum of the shareholdings of the second to the fifth largest shareholders (*Power*) of the director-resigning and director-retaining companies are 16.77 per cent and 18.18 per cent respectively, but the difference is not significant. The case of the variable *Director* is similar. For the variables *Dualism* and *Change*, the percentages of the director-resigning companies are higher than those of the director-retaining companies, with an insignificant difference for the former but a significant difference for the latter. In the Pearson chi-square test, the variables *Dualism* and *Change* all pass the test of significance. The above descriptive statistics show that the risk-related costs represented by the stable characteristics of corporate governance may not be a determining factor in influencing the resignation of independent directors.

For the controlling variables, while the size of the director-resigning companies is smaller than that of the director-retaining companies, the assets/liabilities ratio of the former is insignificantly higher than that of the latter. In addition, the values of *Roe1* and *Roe2* are significantly positive and negative respectively, showing that the earning ability of the director-resigning companies is worse than that of the director-retaining companies.

**Table 6** Pearson Chi-Square Test on Dummy and Dependent Variables

	Pearson Chi-Square	Degree of Freedom	Significance (two-tailed)
Resignation * District	5.526	1	0.019
Resignation * Dualism	2.836	1	0.092
Resignation * Director	0.409	1	0.522
Resignation * Change	5.141	1	0.035
Resignation * Assure1	16.371	1	0.000
Resignation * Trouble	27.963	1	0.000
Resignation * Relation	11.066	1	0.001
Resignation * Audit1	15.910	1	0.000
Resignation * Morass	9.465	1	0.002
Resignation * Roe2	4.424	1	0.035

#### 4.5 Regression Analysis

The above analysis offers us a preliminary result on how corporate factors affect the resignation of independent directors. Yet we need to know further which determinants influence the resignation of independent directors and how these determinants affect the directors. We thus establish the following two-dimensional logistic regression model:

$$\begin{aligned}
 Ln = \frac{p(\text{resignation})}{1 - p(\text{resignation})} \\
 = \partial_0 + \partial_1 \text{remuneration} + \partial_2 \text{times} + \partial_3 \text{district} + \partial_4 \text{share1/power} + \partial_5 \text{dualism} \\
 + \partial_6 \text{director} + \partial_7 \text{change} + \partial_8 \text{assure} + \partial_9 \text{trouble} + \partial_{10} \text{relation} + \partial_{11} \text{audit} \\
 + \partial_{12} \text{morass} + \partial_{13} \text{roe2} + \partial_{14} \ln \text{size} + \partial_{15} \text{leverage} + \varepsilon
 \end{aligned}$$

The definitions of variables in the model are the same as those in Table 3. Since the audit opinions and the three material events have two or more different substitute variables, they can be divided into two kinds of variables, namely, dummy variables and discrete variables. To improve the reliability of the conclusion, we concurrently use two kinds of basic regression models: using the dummy variables of the above variables (Audit1) in the first model, and using the number of hypothecations to the year's total assets (Assure2) and the multi-dimensional classified variable of audit opinions (Audit2) in the second model, other variables being the same.

To ensure there is no collinearity among the variables, we conduct the Pearson correlation test; the unreported results show that the correlations among the variables in the models are all less than 0.4, much lower than the common judgement standard of 0.8 or 0.5. This demonstrates a lack of significant collinearity among the variables.

We use Enter to do the logistic regression. The results of both models in Table 7 show that the major factors influencing the resignation of independent directors are

**Table 7** Regression Results of Determinants of the Resignations of Independent Directors: Enter

Explanatory Variable	Anticipated Symbol	Model 1		Model 2	
		Coefficient	Coefficient	Coefficient	Coefficient
Constant		-5.283 (0.641)	-5.305 (0.652)	-8.358 (1.550)	-8.294 (1.536)
Remuneration	-	-0.134 (1.567)	-0.131 (1.468)	-0.124 (1.439)	-0.119 (1.307)
Times	+	0.515*** (12.124)	0.508 (15.094)	0.549*** (17.244)	0.543*** (17.366)
District	+	1.214** (4.356)	1.176** (4.201)	1.229** (4.385)	1.187** (4.182)
Share1	+	0.010 (0.356)		0.011 (0.428)	
Power	+		0.001 (0.042)		0.003 (0.244)
Dualism	+	0.540 (0.558)	0.557 (0.593)	0.613 (0.694)	0.651 (0.781)
Director	-	-0.050 (0.008)	0.021 (0.001)	-0.025 (0.002)	0.041 (0.005)
Change	+	0.282 (0.217)	0.316 (0.273)	0.610 (0.982)	0.625 (1.025)
Assure	+	1.704*** (8.293)	1.700*** (8.249)	17.139** (6.379)	16.720** (6.402)
Trouble	+	2.452*** (6.621)	2.422*** (6.487)	2.332** (6.180)	2.310** (6.093)
Relation	+	1.417** (4.432)	1.528** (5.487)	1.235** (3.406)	1.315** (4.044)
Audit	+	1.689** (3.455)	1.661* (3.297)	1.479*** (4.096)	1.472** (4.048)
Morass	+	0.541 (0.248)	0.469 (0.182)	0.311 (0.073)	0.215 (0.034)
Roe2	+	-0.990 (0.532)	-0.940 (0.465)	-0.671 (0.211)	-0.588 (0.160)
Lnsiz	-	-0.071 (0.049)	-0.053 (0.028)	0.090 (0.075)	0.105 (0.104)
Leverage	+	-0.828 (0.564)	-0.791 (0.532)	-1.940 (1.454)	-1.926 (1.465)
Chi-square		82.991	82.676	86.288	86.101
-2 Log likelihood		104.205	104.521	100.909	101.096
Nagelkerke R square		0.602	0.600	0.620	0.619
Correct Classification of the Model		84.000	84.000	84.700	84.700

Note 1: \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively.

Note 2: The difference between Model 1 and Model 2 is the difference in value of Assure and Audit; the former are Assure 1 and Audit 1 respectively, and the latter are Assure 2 and Audit 2 respectively.



time costs and the costs involved in legal and reputational risks brought about by the risks of corporate governance. Among them are the following:

4.5.1 The results of both models show that *Times* and *District* are significantly correlated with the likelihood of resignation of independent directors, with levels of significance at 0.01 and 0.05 respectively. Also, immediate costs are an important determinant in an independent director's resignation.

4.5.2 Since opportunity costs as weighed by remuneration have an insignificantly negative correlation to the resignation of independent directors, there is no empirical evidence to support the hypothesis that opportunity costs are related to the resignation of independent directors. Considering the results of the T test and the analysis of individual features, while the average remuneration of independent directors is not high (approximately RMB40,000), their revenue from their profession is relatively higher because they are celebrities or professionals, so remuneration should not be a major source of their revenue (Tan, 2003). As such, remuneration is not an important determinant in their resignation; it may also not be the best variable to measure the opportunity costs of independent directors.

4.5.3 The risk costs as weighed by the material events and audit opinions of companies are significantly correlated with the likelihood of resignation of independent directors. In line with our anticipations, the results of both models demonstrate that the frequency (Model 1) and degree (Model 2) of the occurrence of a company's material events, material lawsuits, and material related-party transactions, as well as the degree of severity of audit opinions, all show a significantly positive correlation with the likelihood of resignation. This indicates that when a material event takes place, and when the accounting reports and the financial condition of the companies are queried by outsiders, the relatively higher governance risk will urge an independent director to avoid as much risk as possible because of his aversion to it.<sup>30</sup>

4.5.4 Finally, some common substitute variables of corporate governance structure, namely *Share1*, *Power*, *Dualism*, *Director*, and *Change*, do not significantly influence the resignation of independent directors, although their effects are consistent with our anticipation. Independent directors do not pay much attention to the common corporate governance indexes when deciding whether to stay or leave; this is related to the selection mechanism of independent directors. In China, independent directors who are nominated by the management or the largest shareholder will be submitted to the shareholder meeting for approval. Since these directors already have a basic understanding of the company's corporate governance structure before they take up the post, the dynamic variables of behavioural features may better

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<sup>30</sup> Tan (2003) opines that the remuneration of independent directors is not usually pegged to a company's performance. In making a decision that is highly risky yet may have high returns, independent directors may lose their reputation and even face serious lawsuits because of the high risk involved, but they will never benefit from the high returns. Also, the external and part-time nature of independent directors deters them from efficiently supervising the operation of the company's risky activities; therefore, independent directors should be averse to risks.

reflect corporate governance risks than do the static ones. The dynamic features and the management style of the company's key man may have greater influence on the level of corporate governance risks faced by independent directors. Hermalin and Weisbach (2003) opine that although a CEO's influence may be an important factor in limiting the independence of independent directors, this influence is usually unobservable. In fact, all factors that may deter the top management from communicating effectively with the director may in turn affect the management effectiveness of the latter, which may lead to the director's resignation. Even in a company where the shareholders have relatively balanced control with relatively less control by the insider, different management styles and the quality of the top management may result in different evaluations of the corporate governance risks by independent directors.

In the linear regression analysis of the two models, the Nagelkerke R Square of the Adjust-R Square are 0.6 and 0.62 respectively, which are rather satisfactory results for a two-dimensional logistic regression. The ratios of the total correct classification of the two models are 84 per cent and 84.7 per cent respectively, showing a high effectiveness of classification. In terms of overall effectiveness, Model 2 performs better than Model 1, which shows that it is better to use the number of material event occurrences instead of the dummy variables to determine the degree of severity. This may be because the director-resigning companies have more material events than the director-retaining companies; the use of dummy variables is thus inadequate in distinguishing the differences between these two types of companies.

#### 4.6 Sensitivity Analysis

Since many variables are used in Models 1 and 2 and the sample is small, the most important factor influencing the resignation of independent directors cannot be obtained with the Enter method, which may in turn affect the validity of the conclusion. For this reason, we test the above model by the Forward: Conditional method. Forward is then substituted for Enter, meaning that all variables are added into the formula according to the possibility of the rate test. Using Conditional when the variables are removed from the formula, new independent variables can then be added according to the rule of the largest model chi-square (namely, the most significant in the chi-square test) when every independent variable is added into the regression analysis in the Forward: Conditional method. Significant variables may then be automatically selected when no additional significant variables can be obtained.

In Table 8, as shown in the Forward: Conditional method, the regression results of Models 1 and 2 are basically the same as with the Enter method, which again demonstrates that the most important factors influencing the resignation of independent directors are *Times*, *Audit*, *Relation*, *Trouble*, *Assure*, and *District*. The only difference is that the variable of *Audit 1* cannot be added into Model 1 when using the Forward: Conditional method, while the variable of *Audit 2* is the third independent variable added to Model 2. The reason is the same as when using the Enter

**Table 8** Regression Results of Determinants of the Resignation of Independent Directors: Forward: Conditional

Explanatory Variable	Anticipated Symbol	Model 1	Model 2
		Coefficient	Coefficient
Constant		-6.697*** (28.647)	-6.843*** (30.230)
Times	+	0.471*** (14.938)	0.512*** (17.265)
District	+	1.324** (6.285)	1.135** (4.387)
<i>Assure 1</i>	+	1.578*** (8.231)	
<i>Assure 2</i>	+		16.396** (6.470)
Trouble	+	2.713*** (10.484)	2.230** (6.502)
Relation	+	1.385** (5.425)	1.344** (5.049)
<i>Audit 1</i>	+		
<i>Audit 2</i>	+		1.204* (3.549)
Chi-square		75.860	81.225
-2 Log Likelihood		111.337	105.972
Nagelkerke R Square		0.563	0.593
Correct Classification of the Model		83.300	83.300

Note 1: \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively.

Note 2: The sequence of independents added into Model 1 is *Times*, *Trouble 1*, *Assure 1*, *District*, and *Relation1*; the sequence of independents added into Model 2 is *Times*, *Trouble 1*, *Audit 2*, *Relation 2*, *Assure 2*, and *District*.

method, namely, that *Audit 2* has greater explanatory power than *Audit 1*; that is, although the director-resigning companies and director-retaining companies may both receive non-standard qualified audit opinions, the degree of severity may differ between these two types of companies (see the results of the T test of the audit opinions of both types of companies), which is better reflected by the use of multi-dimensional classified variables. We substitute *Audit 2* for *Audit 1* in Model 1; the unreported results find that *Audit 2*, being added into Model 1 as the third significant variable using the Forward: Conditional method, has greater significance under the Enter method. These findings all provide empirical support to the above conclusion.

We conduct the sensitivity analyses on Models 1 and 2 respectively as follows: (1) *Assure 1* and *Audit 1* are substituted with the variables of material hypothecation (*Assure 2*) and audit opinion (*Audit 2*); (2) the variable of hypothecation (*Assure 2*) is substituted with the ratio of the number of hypothecations to a company's net

assets; (3) the dummy variable of earning ability (*Roe2*) in both models is substituted with a continuous variable (*Roe1*); and (4) the dummy variable of the ratio of independent directors (*Director*) in Models 1 and 2 is substituted with the continuous variable. The results of the above unreported test demonstrate that the overall effectiveness of the models and the validity of explanation of other variables are nearly the same; the substituted variables have similar explanatory powers to those of the original variables, implying that the regression model is rather stable.

## V. CONCLUSION AND DISCUSSION OF LIMITATIONS

### 5.1 Main Findings of the Paper

5.1.1 As far as major personal characteristics are concerned, the differences between certain characteristics of individual independent directors who resign and directors as a whole are considerable. Relative to the full sample, more of the former are businessmen with financial and legal backgrounds. They are senior in rank with higher academic qualifications and a greater likelihood of not residing in the same province as their serving companies. Their tenure usually lasts for over a year, and they concurrently serve as directors for a number of other companies. Also, elderly independent directors who resign account for only a small percentage of resignations.

5.1.2 In terms of corporate characteristics relative to the director-retaining companies, the director-resigning companies have higher measures on *Times*, *Assure 1*, *Trouble*, *Relation*, *Change*, and *District*, more serious *Audit* and *Morass* measures, and a smaller firm size.

5.1.3 The results of further regression analysis show that the most important factors influencing the resignation of independent directors are the immediate costs (*Times* and *District*) and the risk-related costs, such as the costs of corporate governance risk (*Assure1*, *Trouble*, and *Relation*), legal risks, and reputational risks, all of which show a significant positive correlation with the likelihood of their resignation. We also find that the remuneration of independent directors and other common corporate governance variables have a limited effect on resignation.

### 5.2 Major Limitations of the Paper

Because of differences in the selection of the controlling sample between traditional research methods and our method, we are unable to probe into the real reason for the resignation of independent directors, since some of them continue to serve as an independent director for other companies after resigning their office with a particular company. Also, because of the limitations of statistical methods, the paper does not conduct statistical tests on other intangible opportunity costs that may influence the resignation of independent directors. Since these may also be important factors influencing resignation, all these subjective and objective limitations urge us to take the paper's conclusions into serious consideration.

## REFERENCES

Please refer to P.139–140