2006 年 6 月　第 8 卷　第 2 期
中　国　会　计　与　财　务　研　究
China Accounting and Finance Review
Volume 8, Number 2, June 2006

基于剩余收益模型对股票收益预测能力的实证研究[1]

马忠[2]　张岚[3]

摘要

本文运用中国 A 股上市公司 1994–2004 年的数据，实证检验了 Feltham-Ohlson剩余收益模型对横截面股票收益的预测能力。与国内相关研究不同的是，本文通过计算“综合收益”来运用剩余模型计算股票的内在价值，从而满足了剩余收益模型所要求的“清洁盈余假设”（Clean Surplus Relation, CSR）。在研究方法上，本文借鉴了 Fama and French （1988a,b; 1989）使用的多期收益的检验模型，并结合国内外的相关研究，控制了各种可能因素的影响，增强了研究结论的说服力。本文研究发现，虽然有很多因素影响中国股票市场中未来股票收益的横截面差异，但是随着时间的延长（超过一年），剩余收益模型对股票收益的预测能力及其稳定性明显高于其他变量，而且在控制了相关变量的影响后，运用剩余模型计算的内在价值 / 价格比率（*V/P*）仍然与未来股票收益高度相关。由此本文得出结论，在中国股票市场中，剩余收益模型能够较好地预测未来的股票收益，在本文的样本检验期内，时间越长，预测的效果越好；在控制了相关因素的影响之后，该结论仍然是成立的。

关键词：剩余收益模型、股票收益、预测能力

---

1 作者非常感谢《中国会计与财务研究》杂志两位匿名审稿人以及执行编辑俞伟峰教授提出的修改意见。文中的错误与不足由作者负责。

2 马忠，北京交通大学经济管理学院会计系，副教授。电子邮件：zhma@bjtu.edu.cn；电话：010 51688541；通信地址：北京市海淀区高梁桥路 3 号北京交通大学经济管理学院会计系 100044 。

3 张岚，北京交通大学经济管理学院会计系，硕士研究生。电子邮件：Czzhangl@163.com；电话：010 51684919；通信地址：北京市海淀区高梁桥路 3 号北京交通大学经济管理学院会计系 100044 。

一、引言

会计信息的投资决策有用性历来是证券市场中会计研究的焦点。如何解释会计信息为什么以及怎样作用于投资者决策，需要用较完善的价值评估模型来做比较标准（benchmark）或做解释。价值评估模型的理论基础是“现金流折现法”（Discounted Cash Flow, DCF），由此衍生出价值评估的“自由现金流模型”（Free Cash Flow Model, FCF）和“股利折现模型”（Dividend Discount Model, DDM）。但是以 FCF 和 DDM 为代表的价值评估模型都有其内在的缺陷：一是使用的数据过少，尤其是忽略了财务报告中包含的有关企业当前与未来的有价值的信息；二是它们都是从价值分配（股利）的角度考虑的，未能从价值创造的角度考虑。显然，利用这类模型进行估价还有待于进一步完善。

Feltham 和 Ohlson 等人在传统股利折现模型的基础上，结合经济学的相关理论，从价值创造的角度考虑“股利是怎么来的”，完整地表达了以会计信息为基础的剩余收益价值评估模型。该模型首次将股票价值与股东权益账面价值和未来盈利联系起来，从而确立了会计账面数字在决定股票内在价值中的直接作用，回答了“会计信息是如何决定股价的”这一以往长期研究所没有解决的问题， 为未来的相关研究奠定了坚实的基础。

剩余收益价值评估模型的出现对于实证研究者来说具有重要的意义，它建立了会计数据与公司价值间全新的理论框架，从而更有利于深入探索现行会计信息与股票价格或回报的关系。最近十余年，关于剩余收益价值评估模型的文献频繁地出现在国外著名的学术期刊中，大量的研究表明（Bernard, 1995; Penman and Sougiannis, 1998; Frankel and Lee, 1998a; Francis, Olsson and Oswald, 2000; 等），无论是在对股价的解释力上，还是在根据模型计算出来的价值的准确度上，剩余收益模型都要明显地优于传统的自由现金流模型和股利折现模型。为了进一步探讨该模型在资本市场中的适用性，西方有许多学者研究了该模型对股票收益的预测能力，结果均得出了相似的结论，即，剩余收益模型能够较好地预测股票的未来收益，因而可以有效地帮助投资者做出决策。

我国股市是新兴市场，体系及主体的成熟度尚不能与西方发达证券市场相比。为了引导中国股市逐步走向规范与成熟，就非常需要一个好的价值评估模型对股票的基本价值及预期收益做出合理的评估，从而帮助投资者理性决策。虽然已有国内研究证明了会计信息在中国资本市场上具有相当的决策有用性（赵宇龙， 1998；陈晓等， 1999；孙爱军和陈小悦， 2002）以及剩余收益模型在我国运用的可能性（陆宇峰， 1999；宋剑峰， 2000；陈信元等 2002；陆静等， 2002），但是国内的相关研究均没有对中国股市中该模型对横截面股票收益的预测能力进行检验；而且国内学者在运用剩余收益模型时，也未严格按照模型所要求的“清洁盈余假设”（*CSR*）对收益进行调整。因此，本文在通过计算“综合收益”来满足清洁盈余假设的基础上，研究如下两个问题：

一是在我国这样一个新兴的资本市场中，剩余收益模型是否能够预测未来股票收益；二是如果剩余收益模型与预期股票收益相关的话，它的预测能力是由于其他因素（如公司规模、*E/P*、*B/P*、被忽略的风险因素等）的影响所导致的吗？

本文其余部分的内容安排如下：第二部分"文献回顾"，介绍与本文研究有直接关系的重要国内外文献；第三部分"研究设计"，主要介绍本文的研究模型、使用的研究方法、研究假设、数据样本来源及样本选择标准；第四部分"实证结果及分析"，对相关数据进行实证检验，展示数据处理结果，并进行比较、分析与解释；第五部分"研究结论"，根据实证检验结果概括研究结论，并指出有待进一步研究的问题。

二、文献回顾

早在 1968 年，Ball and Brown（1968）、Beaver（1968）就从信息观的角度，对会计信息与股票价格之间的关系进行了开创性的研究。在此后的数十年中，这一方面的探讨在证券市场的研究中一直居于主导地位。然而信息观的研究基于一个重要的假设，即市场对股票的定价是有效的。到了上个世纪80年代末90年代初，这一假设不断地受到质疑，促使人们把更多的兴趣转移到股票内在价值的计量上。

Ohlson（1990, 1991, 1995），Feltham and Ohlson（1995, 1996, 1997）经过一系列的研究提出的剩余收益模型为计量观的研究奠定了基础。该模型借鉴其他学科的成果，建立了会计数据与公司价值间全新的理论框架，具有十分深远的意义。正如 Bernard（1995）所提到的那样，Feltham 和 Ohlson 提出的剩余收益模型"是近年来资本市场研究的最重要的发展，提供了研究财务报告数据与公司价值关系的基础，同时提供了这一领域缺乏已久的模型结构。(他们研究)的价值可被评价为研究的一次革命，…代表了资本市场研究应遵循但(多年来)未遵循的方向，…某种意义上他们回到了第一步并试图为未来的研究建立更坚实的基础"(Bernard, 1995, p. 733)。

Feltham 和 Ohlson 的研究使"基本分析"(Fundamental Analysis) 这个名词再度在资本市场研究领域流行，促使人们重新重视财务报告数据(Fundamentals) 与公司权益价值间的关系。在此之后，有大量的学者将剩余收益模型和传统的价值评估模型进行了比较，并针对剩余收益模型在股票市场中的适用性进行了实证研究。

(一) 剩余收益模型与其他模型的比较

Bernard（1995）采用 4 年的预测期，证实运用 Feltham-Ohlson 模型计算得出的公司的理论价值能解释股价的 0.68– 0.8，而传统的现金流折现法的结果仅能解释股价的 0.29。

Penman and Sougiannis（1998）利用美国的财务数据，用三种模型对企业权益评价结果与实际股票价格相比较，发现以会计信息为基础的剩余收益模型比其他模型准确，而且与其他模型相比，它们用更短期间（6–8年）使评价误差接近于零。作者还分析了这一原因，认为可能是由于基于应计制会计(accruals)的剩余收益模型考虑了未来事项对股票收益的影响，从而能更好地解释和预测股票的价格。

Francis, Olsson and Oswald（2000）则得出了与 Penman and Sougiannis (1998)相似的结论。他们发现，剩余收益模型在对股价的预测力上要远优于 FCF 和 DDM 模型：剩余收益模型的预测错误为 30%，自由现金流模型为 41%，股利折现模型为 69%；在对股价的解释力上，剩余收益模型能够解释股价的 71%，股利折现模型能够解释 51%，自由现金流模型仅能解释 35%。Frankel and Lee（1998a）也发现，运用该模型计算出的股票内在价值的估计值，和当前的股价高度相关，能够解释股价变化的 70% 以上。

从上述已有研究的结果可以看出，无论是在对当前股价的解释力上，还是在对未来股价的预测力上，剩余收益模型都要远优于传统的自由现金流模型和股利折现模型。

（二）剩余收益模型对股票收益的预测能力

Frankel and Lee（1998a）分别以 *V/P* 比率（这里的 V 指用剩余收益模型计算的公司价值，以下同）、*B/P* 比率（账面市值比）和公司规模为基础构造投资组合，检验了剩余收益模型对未来横截面股票收益的预测能力。他们发现，运用剩余收益法的 Edwards-Bell-Ohlson 模型（Bernard,1994）[4] 计算出来的价值能够较好地预测未来的股票收益，并且和公司规模以及 *B/P* 比率相比，*V/P*比率对股票价格及未来的股票收益有着较高的解释力。并且，他们在比较了 *V/P*和 *B/P*对未来股票收益的预测能力后还发现，随着时间的延长，*V/P*对股票收益的预测能力要显著高于 *B/P*。另外，Frankel and Lee（1998b）还在国际背景下运用该模型并且发现运用剩余收益模型计算的价值对21个国家的股票价格具有高解释力，从而说明剩余收益模型具有广泛的国际适用性。

*V/P*比率对股票收益的预测能力同时得到了其他相关研究的证实。比如，Herzberg（1998）的研究显示，如果使用更加精细的模型估计过程，Frankel

---

[4] "Edwards-Bell-Ohlson 模型"或 EBO 模型"这一名词由 Bernard（1994）最早提出，有时也被称为"EBOP 模型"近年来在相关文献中所提到的"EBO 模型"一般是指 Ohlson（1990, 1991, 1995）以及 Feltham and Ohlson（1995, 1996, 1997）中所提出的剩余收益模型；但是在早期关于该模型的相关论述则通常与 Preinreich（1938）、Edwards and Bell（1961）以及 Peasnell（1982）等关于剩余收益模型的研究联系在一起。

and Lee（1998a）中的结果还会得到进一步的改善，也就是说，*V/P* 对股票收益的预测能力会更高。Dechow, Hutton and Sloan（1999）则通过使用若干不同的时间序列模型来运用剩余收益模型，从而预测股票的未来收益。他们发现考虑了信息动力（Information Dynamics）的剩余收益模型能够较好地预测股票收益的横截面差异。

Lee, Myers and Swaminathan（1999）则检验了当股票价格本身也是其内在价值的噪音估计量（noisy measure）时，如何对运用剩余收益模型计算的股票价值进行评价。他们的研究显示，在相当一般的条件下，一个较好的价值估计量不仅能够解释当期的股票价格，而且对未来的股票收益也具有较好的预测能力。作者运用剩余收益模型计算了道琼斯工业平均指数（Dow Jones Industrial Average, DJIA）的价值，他们发现 *V/P* 比率对未来的股票收益具有较高的预测力。在文章中，作者还分析了之所以能够对未来股票收益做出预测的原因："当（股票的）内在价值难以测量并且/或者当交易成本很重要时，由价格调整至内在价值的过程就需要时间，（在这种情况下），价格就并不总是完美地反映其内在价值。"

Ali, Hwang and Trombley（2003）运用与 Frankel and Lee（1998a）相同的数据来源，检验了剩余收益模型对股票收益预测能力的决定因素。他们的研究发现，剩余收益模型之所以能够预测未来的股票收益，在很大程度上是由于市场的错误定价所导致的。正是由于市场的错误定价，导致股票的价格被市场高估或低估，从而使得投资者有机会获取投资收益。

以上研究采用不同的方法，分别利用横截面数据（Frankel and Lee, 1998a,b; Herzberg, 1998; Ali, Hwang and Trombley, 2003）和时间序列数据（Dechow, Hutton and Sloan,1999; Lee, Myers and Swaminathan, 1999），检验了剩余收益模型对股票收益的预测能力，从而为剩余收益模型在证券市场中的应用提供了足够的证据支持。然而，上述研究均是针对发达国家的证券市场进行检验，在数量颇多的新兴资本市场中，存在着建立及存在时间短、法律及管理不健全、会计信息质量不高、投资人心理不成熟、投机性强等诸多不同于成熟资本市场的特征，剩余收益模型是否能够同样适用呢？这也正是本文研究的主要问题。

（三）国内的相关研究

陆宇峰（1999）采用 Collins 等（1997）[5]运用的模型，根据 Ohlson（1995）提出的剩余收益模型，利用 Theil 于 1997 年理论推导而由 Easton 于 1985 年

---

[5] Collins, D. W., E. L. Maydew, and Ira S. Weiss, 1997, Changes in the value-relevance of earnings and book values over the past forty years, *Journal of Accounting and Economics* 24, 39–67.

运用的方法，检验了账面净资产和会计盈余对股价解释力的强弱。结果发现样本期间净资产和会计盈余的联合解释能力呈上升趋势，且会计盈余是股价的主要解释力量。该文的研究揭示了中国的资本市场虽然还不成熟，但投资者已能对公开会计信息有方向上的准确判断。

宋剑峰（2000）借助于剩余收益法的 Edwards-Bell-Ohlson 模型阐述了 *P/B* 与 *P/E* 的涵义，并运用中国股市的经验数据，以事后实际数据作为市场的预期值，对 *P/B* 与 *P/E* 是否能够预测未来的 *ROE* 进行了实证检验。结果表明，根据剩余模型推导出的公司内在的 *P/B* 与 *P/E* 能够预测公司未来的 *ROE*，中国股市已经具有一定的使用会计数据和做出理性预期的能力。

陈信元、陈冬华和朱红军（2002）运用 Ohlson （1995）提出的剩余收益模型考察了上海证券市场 1995–1997 年度会计信息的价值相关性。结果发现，与Ohlson模型的预测一致，收益、净资产和剩余收益与股票价格呈正相关；并且，当同时考虑剩余收益、规模和流通股比例时，价值相关性有所提高。这说明在我国的证券市场中，流通股比例也是影响股票价格的一个重要变量。

陆宇峰（1999）、宋剑峰（2000）以及陈信元、陈冬华和朱红军（2002）的研究证明了剩余收益模型在中国股市中具有运用的可能性。然而，他们并没有直接利用剩余收益模型计算股票的基本价值，并检验其与股票收益的关系；而且，在运用剩余收益模型时，他们也没有考虑剩余收益模型的一个基本假设—清洁盈余会计关系 （Clean Surplus Relation, CSR），而这是模型成立的一个关键条件。

王化成、程小可和佟岩（2004）、孙铮和李增泉（2001）、赵宇龙（1998）、陈晓等（1999）以及孙爱军和陈小悦（2002）等则进一步研究了中国股市中会计信息与财务指标的价值相关性，结果表明，虽然中国股市的成熟度尚不能与西方发达的证券市场相比，但会计盈余、账面净资产、剩余收益等对股票价格有着较强的解释力，具有很大的价值相关性。从而表明了会计信息在中国股市具有一定的投资决策有用性，投资者已经能够根据会计信息做出比较理性的判断。这从另一个方面证明了以会计信息为基础的剩余收益模型在中国股市中具有运用的可能性。

三、研究设计

（一）本文所使用的剩余收益模型及其计算

在传统的股利折现模型的基础上，Ohlson（1990, 1991, 1995），Feltham and Ohlson （1995, 1996, 1997）论证了只要公司的盈利和账面净资产以一种符合 *CSR* 的方式被预测，则股利折现模型中的股票价值可以表示为权益的账面价值与未来剩余收益的现值之和：

$$V_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[NI_{t+i} - (r_e B_{t+i-1})]}{(1+r_e)^i} = B_t + \sum_{i=1}^{\infty} \frac{E_t[(ROE_{t+i} - r_e)B_{t+i-1}]}{(1+r_e)^i} \quad (1)$$

其中， B_t = 时刻 t 权益的账面价值

$E_t[.]$ = 基于时刻 t 可利用信息的期望值

NI_{t+i} = $t+i$ 期的收益

ROE_{t+i} = $t+i$ 期的税后净资产收益率，即， NI_{t+i}/B_{t+i-1} 。

公式（1）将股票的价值用无限的区间来表示，但是在实际中，要求有限区间的预测。这就要求对“期间价值”(Terminal Value, TV) 做出估计—即企业在 T 时刻后产生的剩余收益贴现到 T 时刻的现值之和。按照“平均利润率”理论及经济学相关理论，当市场达到“竞争均衡”(competitive equilibrium) 时，企业的获利水平就会在较长一段时间内保持大体稳定。因此，在一定的预测期间之后，我们就可以采用永续年金的方式来计算 T 时刻之后企业产生的剩余收益的现值。

利用一定的数学推导并运用相关的财务理论，可以采用以下公式来计算在时刻 T 的期间价值 TV_T：

$$TV_T = \frac{(ROE_{T+1} - r_e)}{(1+r_e)^T r_e} B_T$$

在理论上，为了使企业能够达到有效均衡的状态，以便保证研究结果的准确性，T的取值应该足够大。但是，Frankel and Lee (1998a) 以及Lee, Myers and Swaminathan (1999) 在增加了预测期间的长度至 12 年之后，检验了模型对股票收益的预测能力，结果发现在三年的基础上再增加预测期间的长度对模型的预测能力几乎没有影响；另一方面，由于中国股市成立的时间较短，并且考虑到目前国内缺乏关于未来盈利预测的权威数据库。因此，本文拟采用当年年末的财务数据并运用未来三年的事后实际数据代替预测值来运用剩余收益模型计算股票的内在价值[6]，则公式（1）可变形为：

$$\hat{V}_t = B_t + \frac{(FROE_{t+1} - r_e)}{(1+r_e)} B_t + \frac{(FROE_{t+2} - r_e)}{(1+r_e)^2} B_{t+1} + \frac{(FROE_{t+3} - r_e)}{(1+r_e)^2 r_e} B_{t+2} \quad (2)$$

[6] 由于相关数据库的局限性，本文只能使用事后的实际数据来代替预测值，若要使模型更加实用，则可以根据模型的条件和中国的特点演绎出一个合理的预测框架，以便能够将该模型应用于实务。

其中，B_t = 最近一期财务报告中的每股净资产

r_e = 权益资本成本（将在下面讨论）

$FROE_{t+i}$ = 预测的第 $t+i$ 期的净资产收益率[7]

B_{t+i} = 预测的第 $t+i$ 期的每股净资产

本文结合Frankel and Lee（1998a）、Lee, Myers and Swaminathan（1999）以及 Ali, Hwang and Trombley（2003）的研究方法，并且考虑到相关数据的可获取性及我国股市的实际特点，确定该模型的计算方法如下：

1、综合收益的计算

注意到剩余收益模型的一个关键假设为清洁盈余关系（Clean Surplus Relation, CSR）[8]，也称净盈余关系，其数学表达式为：

$$B_{t+1} = B_t + NI_{t+1} - D_{t+1}$$

即，从一个期间到另一个期间权益账面价值的变化等于收益减去"股利净支付"[9]。

Fairfield（1994）对清洁盈余会计体系解释为：清洁盈余会计意味着股利折现模型中的股利可以用收益的账面价值替代。Ohlson（1995）指出，清洁盈余关系的存在使得红利的发放虽然减少了账面净资产，但是并没有影响到资产的当期盈利能力。他将此关系运用于股利折现模型后得出：公司价值等于账面净资产加上未来剩余收益的现值，并分析此公式可推出 MM 的"股利政策无关"假设，从而解决了"未来股利决定公司价值"与"未来股利政策不影响公司价值"在字面意义上的矛盾。

Feltham 和 Ohlson 用清洁盈余关系取代了以往价值评估模型中所要求的"有效市场假设（EMH）"作为分析的必要条件，并且无需考虑股利发放率、会计政策、方法选择和盈余管理问题，只要预测期的会计处理（可以虚拟）满足清洁盈余关系。从这个意义上讲，它非常适合于对公司价值的基本分析。因

---

7 从理论上讲，计算 $FROE$ 应采用 NI_{t+i}/B_{t+i-1} 计算，但为了更好地避免异常值的情况，本文采用上期期末和本期期末净资产的平均数计算， 即 $FROE = NI_{t+i}/[B_{t+i} + B_{t+i-1}]/2$ 。

8 剩余收益模型由股利折现模型推导而来，在推导的过程中，清洁盈余关系是一个关键的条件，也就是说，若不满足清洁盈余关系，则无法从股利折现模型推导至剩余收益模型（推导的具体过程参见 Ohlson, 1995），因此，就这一方面来说，清洁盈余关系在剩余收益模型中是必不可少的；另外，从理论的角度来看，清洁盈余关系也是一个关键性的条件，请参见下文的进一步解释。

9 Feltham and Ohlson 提出清洁盈余关系时曾指出，清洁盈余关系式中 d 的精确表述应为："业主派得（即股利）减去业主投资后的净额"（dividends net of capital contributions），为了避免如此麻烦的称呼而简称为"股利"，因此，这里的 d 并不仅仅指我们通常意义上所说的"股利"，而是等于本期业主派得减去业主投资。

此，清洁盈余关系为直接根据会计信息(资产负债表和损益表)估计一个公司的市场价值提供了模型基础，并提供了一个与计量观一致的框架。

清洁盈余关系的提出并不是要重新建立一个新的会计核算体系，其主要目的在于提高公司内在价值估价的准确性和减少盈余管理，尽量做到没有任何可以用作估价的信息的缺失。在将公司的活动划分为价值创造活动和价值分配活动的基础上，清洁盈余关系把一个公司的价值归为由公司价值创造活动引起，而不是由公司的价值分配活动引起的。因此，公司账面净资产的改变在扣除公司价值分配活动所引起的部分以外，应当全部由公司的价值创造活动所形成。由上可见，清洁盈余关系在剩余收益模型的计算中，是一个非常关键的条件。

在 Frankel and Lee （1998a）以及 Lee, Myers and Swaminathan （1999）的研究中，清洁盈余关系主要体现在权益账面价值的计算中，即采用当期权益账面价值、预测的下一期的收益及预测的股利支付，运用以上清洁盈余关系的公式来计算下一期权益的账面价值。这需要有一个比较权威的关于盈利预测的数据库及相对稳定的股利支付率，而目前我国这两个条件均不具备，这就需要考虑采用其他方法来满足清洁盈余假设。

从清洁盈余关系的定义来看，该关系式的本质是所有利得和损失都必须通过损益表反映，即企业权益的账面价值只能由收益或企业与业主间的交易或事项而改变。而按照综合收益理论，“综合收益”(Comprehensive income）这一概念完全符合清洁盈余会计假设。所谓综合收益是指“企业在报告期内，从业主以外的交易，及其他事项和情况中所发生的权益变动。它包括报告期内除业主投资和业主派得外，一切权益上的变动。”(SFAC3, Para56） 通过该定义可知，实际上一定期间内的权益变动被分成了三部分：综合收益，业主投资和业主派得，即：

一定期间的权益变动 = 本期的综合收益 + 本期的业主投资 – 本期业主派得

从以上综合收益的定义来看，它和清洁盈余关系在本质上是一致的，清洁盈余关系中的收益其实就是指综合收益。因此，本文拟通过计算综合收益来满足剩余收益模型中的清洁盈余假设。[10]

[10] 综合收益理论由收益理论中的损益满计观的观点发展而来，“综合收益”这一概念最早由 FASB 提出，随后被广泛用于世界许多国家的会计准则（包括国际会计准则），并成为收益理论的研究热点之一，从而在此基础上形成了综合收益理论，尽管我国目前仍采用净收益来报告企业业绩，但由于综合收益比净收益更加全面和公允，因此在我国2005年新修订的《企业会计准则—财务报表列报(草案)》中，要求企业在“所有者权益增减变动表”中分别列报“当期损益、直接计入所有者权益的利得和损失，以及与所有者的资本交易引起的所有者权益的变动”(见该草案第7页），实际上就是将综合收益分项目列示。因此，无论从理论上还是从实务上来看，综合收益理论同样适用于我国。从而在我国股市中，综合收益概念与清洁盈余关系同样具有本质上的一致性。

综合收益的来源非常广泛，除了净收益外，还包括其他一些不能计入净收益的项目，这些项目被称为其他综合收益（Other comprehensive income），也可以称为“不净盈余”（Dirty surplus），主要包括一些已确认未实现的利得和损失[11]。在目前国内的实务中，不净盈余包含的项目非常复杂，如果逐项计算这些项目并通过计算其与净收益之和来直接计算综合收益，不仅工作量巨大，而且由于中国上市公司各种交易和事项的复杂性，会降低计算的准确性。有鉴于此，本文采用间接计算综合收益的方法，即对以上关于综合收益定义的关系进行简单的变形，即可得出以下综合收益的计算公式：

综合收益 = 本期期末股东权益合计 – 上期期末股东权益合计
+ 本期业主派得 – 本期业主投资

由于：股利净支付 = 本期业主派得 – 本期业主投资
则以上公式可变为：

综合收益 = 本期期末股东权益合计 – 上期期末股东权益合计 + 股利净支付

其中，本期期末和上期期末的股东权益合计均可从公司的年度报告中获得；股利净支付则按照清洁盈余关系的定义，并结合我国当前的实际特点，采用如下公式计算：

股利净支付[12] = 现金股利[13] – 发行的新股、配股[14]。

2、关于预测的净资产收益率（*FROE*）

在国外的相关研究中，对于 *FROE* 的确定一般都是使用已有的财务分析师的预测数据库。但是由于我国目前的财务分析市场还不发达，很难在这方面找到一个比较权威的数据库；而且考虑到我国股市成立的时间较短，也难以采

[11] 在美国的会计准则中，其他综合收益主要包括外币换算调整（SFAS52）、最小退休金负债调整（SFAS87）、债务和权益证券的未实现利得和损失（SFAS115）以及避险的衍生金融工具公允价值的变动（SFAS133），在我国的会计实务中，其他综合收益包含的项目很多，主要包括外币资本折算差额、以前年度损益调整、资产重估增值、接受捐赠资产，等等。

[12] 正如注释 9 所述，这里的股利净支付即清洁盈余关系中的 d，指的是业主派得（股利）减去业主投资后的净额。

[13] 之所以在该股利净支付的公式中仅包括现金股利而没有包括股票股利，并不是由于现金年股利属于“现金支付”，而是考虑到股票股利并不会对企业净资产的账面价值产生影响，而现金股利却影响企业净资产的账面价值。

[14] 在我国的股市中，配股和发行新股是上市公司比较普遍的一种股本扩张方式（这一点和美国股市有着很大的不同），会改变企业净资产的账面价值，考虑到清洁盈余关系中 d 的本质含义，配股和发行新股应属于股东对企业的再投资，因此应在公式中将其减去。

用时间序列模型来对 *ROE* 进行预测。因此，本文在研究中使用事后实际的、按照清洁盈余会计关系计算的 *ROE* 来代替预测未来的 *ROE*[15]。

3、确定权益资本成本（r_e）

在理论上，r_e 应该是公司特有的、能够反映投资者当期投入一个公司或项目所要求的回报率。Abarbanell and Bernard（1995）以及 Frankel and Lee（1998a）在其研究中均发现，权益资本成本的选择对分析结果几乎没有影响；而我们采用不同的权益资本成本对中国股市进行检验后也得出了相同的结论[16]。有鉴于此，本文采用 Lee, Myers and Swaminathan（1999）中的方法确定权益资本成本，即在当年无风险利率的基础上加一个固定的风险溢价作为当年的权益资本成本；当年的无风险利率采用当年的三个月定期银行存款利率[17]；关于风险溢价，本文参考朱世武和郑淳（2003）关于中国股票市场中风险溢价研究的结论，确定为 2.03%[18]。

（二）研究中使用的回归分析模型

本文使用以下模型检验剩余收益模型对未来多期股票收益的预测能力：

$$r(t,t+k)=X_t\theta+e_{t+k}, \quad (3)$$

---

[15] 具体计算公式为：$FROE_{t+i}=CI_{t+i}/B_{t+i-1}$；其中，$CI_{t+i}$ 为第 $t+i$ 期的综合收益；B_{t+i-1} 为第 $t+i-1$ 期末的净资产账面价值。

[16] 我们同时采用三种方法确定权益资本成本：a、按照 CAPM 和每年不同的风险溢价计算每年每个公司不同的权益资本成本；b、按照每年不同的无风险收益率加固定的风险溢价（所有公司相同）计算；c、对所有公司所有年份取一个固定数（本文中取 8%）。

[17] 三个月定期银行存款利率来源于中国人民银行网站：http://www.pbc.gov.cn。

[18] 为了检验风险溢价对研究结论的影响，本文曾经同时采用三种方法确定风险溢价：a、直接采用朱世武和郑淳（2003）关于中国股票市场中风险溢价研究的结论，即 2.03%；b、结合中国股市的周期性波动情况，本文将 1995 年 1 月至 2004 年 12 月确定为一个周期，根据这段期间的的 A 股综合月收益率数据，采用几何平均法重新计算了年平均股权风险溢价，并以此作为风险溢价；c、考虑到中国股市的前期和后期风险溢价的变化较大，本文根据 Damodaran（2000）的相关研究，设计了如下公式来计算每年不同的风险溢价：1995 至 2004 年的年平均股权风险溢价 $\times\dfrac{\text{当年股市月收益率的标准差}}{\text{1995 至 2004 年股市月收益率的标准差}}$；

本文在同时采用这三种方法计算的风险溢价对本文的假设进行检验后发现，风险溢价的选择对分析结论几乎没有影响，而且考虑到国外有关风险溢价的研究都是针对一个较长的时间段，因此本文最终采用朱世武和郑淳（2003）关于中国股票市场中风险溢价研究的结论，即 2.03%，作为本文中计算权益资本成本的风险溢价。

其中，$r(t, t+k)$ = 第 t 期至第 $t+k$ 期（一般使用月份）的股票收益率；
k = 预测的期数；
X_t = 关于解释变量的 m 维行向量（包括截距项）；
θ = 关于斜率系数的 m 维列向量；
$e_{t+k,t}$ = 回归残差项。

该模型可用于检验未来多期收益的预测能力，由 Fama and French（1988a, b, 1989）[19] 提出。该模型实质上是将未来 k 个期间的回报率对当期一个或多个解释变量进行回归，因此是一个多期的回归分析模型。在本文的研究中，分别取 k = 1、3、6、12、18、24 和 36 个月采用 *OLS* 进行回归分析，首先将未来 1–36 个月的股票收益对 *V/P* 比率进行单因素的回归分析，再逐步加入相关的控制变量进行多因素的回归分析 [20]。

Campbell（1993）的研究显示，在样本检验期重迭的情况下，使用有重迭的数据可能会导致残差项的序列相关性和异方差。为此，本文对所有的 t 统计量，均采用 Newey and West（1987）中的方法进行了序列相关和异方差性调整 [21]。

（三）研究假设及模型

1、与当前股票价格的相关性

传统的财务理论认为，股票真实的内在价值 V 是无法直接观察到的。因此，无论从学术还是实务的观点来看，都需要找到一个能够较好的代表股票内在价值且易于观测的变量。很多金融经济学家都认为，股票的价格 *P* 正是这样一个变量：能够很好的体现股票的内在价值，而且很容易观测。因此，一个好的价值估计量能够很好的解释当期的股票价格。Bernard（1995）、Penman

[19] Fama 和 French 在研究中将该模型用于对时间序列数据的检验，本文在这里主要借鉴了该模型中关于未来多期股票收益的因变量，并将其用于对横截面数据的检验。

[20] 国外的研究（Penman and Sougiannis, 1998）表明，当预测期为 5–8 年时，模型预测的准确力会大大提高，但由于中国股市成立的时间较短以及相关数据的局限性，所以本文中只能使用 3 年的数据来检验模型对股票收益的预测能力，预测的准确性一般不如 5–8 年预测期下的准确性；在以后的研究中，可以延长预测期间，以便进行进一步的研究，从而观察其在更长的预测期间内对未来股票收益的预测能力。

[21] Newey and West（1987）已经证明，在有未知形式的异方差和序列相关时，通过运用 Newey-West 方法计算的 HAC 一致协方差（Heteroskedasticity Autocorrelation Consistent Covariance），可以保证估计量的一致和有效；Lee, Myers and Swaminathan（1999）、Frankel and Lee（1998a）以及 Ali, Hwang and Trombley（2003）均采用这种方法修正由于样本检验期重迭以及其他问题而导致的序列相关性与异方差。

and Sougiannis（1998）和 Frankel and Lee（1998a,b）的研究也显示，与账面价值相比，运用剩余收益模型计算的股票内在价值与当前股票价格具有较高的相关性，因此：

H1：相对于账面价值来讲，用剩余收益模型计算的公司权益价值能够更好地解释当前的股票价格；

对于假设 H1 ，本文拟采用斯皮尔曼相关系数（Spearman Correlation Coefficient）进行检验，以便在检验股票内在价值与当前股票价格相关性的基础上，进一步分析剩余收益模型对未来股票收益的预测能力。

2、与未来股票收益的相关性

股票价格不仅是股票内在价值的体现，同时还受到许多其他因素的影响。正如 Lee, Myers and Swaminathan （1999） 中所提到的那样，股票价格本身也是其内在价值的噪音估计量（noisy measure）。但在较长的期间内，股票价格和其内在价值是趋于一致的，无论是可观察到的价格还是价值的估计量(即运用各种模型所计算的股票价值）通常都是趋同于真实（但是观察不到）的内在价值（intrinsic value）[22]。按照这一观点，股票价格是以其内在价值为中心而上下波动的，目前股票价格与其内在价值偏离的程度越远，股票价格在未来变化的可能性也就越大，从而可以通过观察股票价格与其内在价值的偏离程度来预测未来的股票收益。因此，一个好的价值估计量不仅能够解释当期的股票价格，而且对未来的股票收益具有较好的预测能力。

按照上述价值投资理论的观点，股票的价格是围绕着其内在价值上下波动的，从长期来看，股票的价格有向其内在价值回归的趋势。因此，当股票价格不同与其内在价值时，就可以利用 V/P 比率（其中 V 为股票内在价值， P 为股票价格）来预测股票的未来收益。在这一观点的基础上，并结合Frankel and Lee（1998a）、Lee, Myers and Swaminathan （1999）等的相关研究，本文设计了 V/P 比率这一变量作为检验剩余收益模型对股票收益预测能力的主要变量。如果剩余收益模型能够较好的适用于中国股市，那么一般情况下，运用剩余收益模型计算的 V/P 比率应该与未来的股票收益成正比，即：V/P 比率越高，未来的股票收益也越高；反之亦然。但股票价格向其内在价值的回归，是一个较长时期的过程；Frankel and Lee （1998a） 以及 Lee, Myers and

[22] 但是股票的内在价值也不是一成不变的，由于股票的内在价值由公司的特点决定，如资产、利润、股利、公司发展、管理者特点等等，因此内在价值也随不同因素的变化而变动，但大多数情况下内在价值的变动没有市价变动那么快和剧烈，从而投资者就有利用这二者的时间差而谋利的机会。

Swaminathan （1999） 也发现，随着时间的延长， *V/P* 比率明显地表现出较强的预测能力。则本文假设：

H2：*V/P* 比率能够预测未来的股票收益，时间越长，预测效果越好；

本文用以下模型检验假设 H2：

$$r(t,t+k)=\beta_0+\beta_1 V/P+e_{t+k}, \tag{4}$$

其中，$r(t, t+k)$ 为第 t 月至第 $t+k$ 月的股票收益率，本文采用 Frankel and Lee（1998a）以及 Ali, Hwang and Trombley （2003）中使用的购买—持有收益率[23]（Buy and Hold Return, *BHR*）计算股票收益率，其计算公式为：

$$BHR_t=\prod_{t=0}^{T}(R_{it}+1)-\prod_{t=0}^{T}(R_{mt}+1)$$

其中，R_{it}为公司 i的股票在 t时期的收益率；R_{mt}为第 t月的市场收益率。本文中分别用 *Ret*1 、 *Ret*3 、 *Ret*6 、 *Ret*12 、 *Ret*18 、 *Ret*24 和 *Ret*36 表示 k = 1 、 3 、 6 、 12 、 18 、 24 和 36 个月时的股票收益率。

在研究中，股票价格 P 的确定是一个重要的问题。中国证监会要求上市公司在会计年度结束后四个月内公布公司的财务报告。但是考虑到市场对年报信息的反应有一定的滞后；另一方面，国外的相关研究认为，六月底的股票价格可以比较充分地反应年报中的信息（参见 Fama and French, 1992; Frankel and Lee, 1998）。因此，为了使股票价格与年报信息相匹配，本文中的股票价格采用会计年度结束后第二年6月份最后一个交易日的股票收盘价。考虑到这一因素，本文中样本公司的股票收益率自第二年 7 月份开始计算，即 *Ret*1-*Ret*36分别表示以第二年7月份为起点的未来1个月到36个月的股票收益率。

*V/P*为上文提到的内在价值/价格比率，计算方法为：利用上文中剩余收益模型的公式计算股票的内在价值 V，再除以财务年度结束后第二年 6 月份最后一个交易日的股票收盘价 P，然后检验其对以第二年 7 月份为起点的未来 1 个月到 36 个月的股票收益的预测能力。

---

[23] 股票收益率的计算方法有很多种， Fama and French （1988a,b, 1989）在其研究中使用的是连续复利计算的股票收益率（continously compounded return）。本文之所以在研究中使用 *BHR* ，主要是考虑到 Frankel and Lee（1998a）以及 Ali, Hwang and Trombley （2003）均在其研究中使用该收益率检验剩余收益模型对未来横截面股票收益的预测能力。为了使本文结论不受股票收益率计算方法的影响，本文将在下文的稳健性检验中使用连续复利计算的股票收益率代替 *BHR* 作为因变量。

考虑到中国股市的阶段性特征[24]，本文又在模型中加入阶段虚拟变量，以便控制各种阶段性变化的影响，回归模型如下所示：

$$r(t,t+K)=\beta_0+\beta_1 V/P+\sum_{i=1}^{4}\alpha_1 Stage(i)+e_{t+K,t} \quad (5)$$

其中，*Stage*(i) 表示第 t 阶段的虚拟变量，分别为：*Stage*(1)，*Stage*(2)，*Stage*(3)，*Stage*(4)，阶段的划分主要基于我国股市发展的政策干预和制度变迁特征，根据沪深股票市场价格的波动，并参考陆蓉和徐龙炳 （2004） 的方法，将样本期间内的中国股市划分为五个阶段[25]，若样本公司属于某一阶段，则该阶段的虚拟变量取值为 1 ，否则取 0 。

3 、与股票收益有关的其他相关因素的影响

除内在价值外，股票收益还受到其他许多因素的影响。资本资产定价理论（*CAPM*） 认为，股票回报是对市场风险因素的补偿，高回报伴随着高风险。然而近年来大量的实证研究表明，除了市场风险因素以外，股票的横截面收益与公司的相关特征有关。 Fama and French （1992, 1993, 1996） 在其经典文献中提出了解释股票收益的三因素模型，将公司规模和账面市值比作为两个额外的风险因素；结果发现，这两者的值较低的股票的平均收益率都较高，即使经过贝塔系数调整后也是如此；由此作者认为，公司规模和账面市值比能够预测股票收益的横截面差异。但 Frankel and Lee（1998a）发现，在控制了这两种因素之后， *V/P* 比率依然能够很好地预测未来的股票收益。

另外，陈信元等（2001），陆璇等（2001），贾权和陈章武（2003），周建波（2004），苏宝通和陈炜（2004），许年行和吴世农（2004），苏冬蔚和麦元勋（2004）针对中国股票市场的研究表明，除了公司规模和 *B/P* 比率

[24] 由于本文的样本公司来自不同的年份，为了检验 *V/P* 比率在不同的年度对未来股票收益的影响，本文还曾经在模型（5）中分别加入两组不同的虚拟变量进行检验：年度虚拟变量及 *V/P**year t ；结果发现，当加入年度虚拟变量时，本文的结论几乎不受影响，但各个年度虚拟变量的取值基本都是显著的；当K取不同的值时，各年 *V/P* 比率的斜率系数也仍然是显著的，但其斜率系数在不同的年份有一定的差异。考虑到这一点，我们将在下文的稳健性检验中进行分年度回归，以保证结论的可靠性。

[25] 五个阶段分别为：1994 年 9 月至 1996 年 1 月，1996 年 1 月至 1997 年 5 月，1997 年 5 月至 1999 年 5 月，1999 年 5 月至 2001 年 6 月，2001 年 6 月至 2002年1月，在划分阶段的过程中，我们对沪市和深市分别进行了分析，对于上海股票市场，选用上证综合指数每日收盘指数；深圳股票市场选用深证成分指数每日收盘指数；本文在仔细对比后发现，沪市和深市的股票价格波动情况基本相同，因此在划分阶段时，不再区分沪市和深市。

以外，我国的股票收益还受到流通股比例、市盈率、现金红利率以及每股收益等的影响。如果剩余收益模型能够预测未来的股票收益，如上所述，虽然这些因素有一定的影响，但是该模型对股票收益的预测能力应该不是由于这些因素所造成的，在控制了这些相关因素的影响之后，剩余收益模型依然对未来的股票收益具有显著的预测能力[26]。则本文假设：

H3：剩余收益模型对股票收益有着显著的预测能力不是由于其他因素的影响导致的；

本文用以下模型检验假设 H3：

$$r(t,t+K)=\beta_0+\beta_1 V/P+\beta_2 LnME+\beta_3 B/P+\beta_4 OUTSHARE+\beta_5 EPS \\ +\beta_6 EPSdummy+\beta_7 E/P+\beta_8 D/P+\beta_9 D/Pdummy \\ +\sum_{i=1}^{4}\alpha_i Stage(i)+e_{t+K,t} \quad (6)$$

其中，

LnME 为表示公司规模的变量，即对 *ME* 取自然对数，*ME* 采用样本期间第二年六月底流通股的总市值，为股票在六月底的收盘价与流通股数的乘积；

B/P 为账面市值比，采用每年年末的每股净资产除以第二年六月份最后一个交易日的股票收盘价；每股净资产可以从公司的年报中获得；

OUTSHARE 表示流通股比例，为第二年六月底的流通股股本除以总股本；

EPS 表示每股收益，为税后净利润除以总股数；由于税后净利润可能为零或负数，因此还需加入一个哑变量（*EPS dummy*），净利润为零或负数时哑变量取 1，其余取 0；

E/P 为收益 / 价格比，即每股收益除以第二年六月底的收盘价，也就是市盈率的倒数；

D/P 表示现金红利率，为每股现金分红（D）除以第二年六月底的收盘价；同时设置现金红利率哑变量（*D/P dummy*），现金分红为零时取 1，其余取 0。

[26] 除了本文提到的这些控制变量之外，Ohlson and Feltham（1995）以及 Penman（2001）等的研究表明，会计盈余的组成（永久性盈余和暂时性盈余）以及会计政策的选择对剩余收益模型的应用有着一定的影响；本文中没有考虑这些因素，在以后的研究中可以加入，以便进一步研究在控制了这些因素的影响之后剩余收益模型对未来股票收益的预测能力。

4、风险因素的影响

Beaver（2002）、Kothari（2001）以及 Lo and Lys（2000）认为，*V/P*比率对股票收益的预测能力可能是由于模型中存在着某些被忽略的风险因素所导致的。而 Frankel and Lee（1998a）将公司规模和账面市值比作为风险因素的代理，在控制了这两者的影响之后，发现 *V/P* 比率仍然能够较好的预测未来的股票收益。Ali, Hwang and Trombley（2003）则进一步检验了剩余收益模型对股票收益预测能力的决定因素，结果发现，风险因素虽然与 *V/P* 比率有一定的相关性，并且对股票收益也有一定的影响，但是 *V/P* 比率对股票收益的预测能力却不是由于风险因素的影响所导致的，而是由于市场对股票的错误定价，从而使得能够利用 *V/P* 比率预测未来的股票收益。在控制了风险因素的影响之后，*V/P* 仍然有较高的预测股票收益的能力。因此本文假设：

H4.1：*V/P* 比率和某些风险因素具有一定的相关性；
H4.2：*V/P* 比率对股票收益的预测能力并不是由于其与某些风险因素的相关性所导致的。

本文分别采用模型（7）和模型（8）检验假设 H4.1 和 H4.2：

$$V/P = a_0 + a_1 Beta + a_2 LnME + a_3 B/P + a_4 D/M + a_5 Zvalue + a_6 StdROE + a_7 AverCC + a_8 DTL + e \quad (7)$$

$$r(t,t+K) = \beta_0 + \beta_1 V/P + \beta_2 Beta + \beta_3 LnME + \beta_4 B/P + \beta_5 D/M + \beta_6 StdROE + \beta_7 AverCC + \sum_{i=1}^{4} \alpha_1 Stage(i) + e_{t+K,t} \quad (8)$$

其中，

Beta 表示公司的贝塔值：反映了公司的市场风险，采用每年 1 月 1 日至 6 月 30 日的股票日收益率数据，股市综合日收益率数据，按照贝塔系数的定义，根据证券收益率与市场综合收益率的相关系数、证券日收益率的标准差与市场综合收益率的标准差，直接计算每年的贝塔值；

D/M 表示公司的债务权益比：反映了公司的财务杠杆风险，为年度末的负债除以所有者权益；

Z-value 表示公司的 *Z* 值，我们按照 Altman（1968）中的方法计算公司的 *Z* 值，以反映公司的财务破产风险；

StdROE 表示公司股票收益率的标准差，反映了股票收益的波动程度，可以作为公司风险因素的一个代理，本文中通过计算样本公司每年 1 月 1 日至 6 月 30 日的股票日收益率的标准差得到；

AverCC 表示公司所在行业的平均资本成本，反映了行业的风险，属于可能被忽略的、不能由公司特征所捕获的风险，可以按照每年行业的平均总资产

报酬率计算。行业分类标准取自中国证监会发布的上市公司行业分类指引，剔除金融保险业后，共分为 12 个大类行业来计算行业平均资本成本。

此外，按照 Fama and French（1992, 1993, 1996）的研究，公司规模（*ME*）和账面市值比（*B/P*）也可作为风险因素的代理，反映了公司的特有风险。

（四）样本选择和数据来源

本文所选用的数据期间为 1994–2004 年[27]。考虑到本文的样本检验期为 1–36个月，且如前文所述，本文中样本公司的股票收益率自会计年度结束后第二年 7 月份开始计算，这意味着为了检验 *V/P* 比率与未来 36 个月股票收益的相关性，样本公司必须有自第二年 7 月开始的至少三年以上的股票交易数据，因此，作为本文研究对象的样本公司只能截至2000年底，以便于能够获取未来三年的相关数据。

综上所述，本文选择我国 1994 年底至 2000 年底在深沪两市上市的 A 股上市公司作为研究对象。所选取的样本公司须满足下列条件：

□ 由于 ST 和 PT 公司的股票价格受非业绩因素的影响较为严重，且容易被庄家炒做，因此在第 t 年的研究样本中剔除第$[t, t+3]$年间被 ST 和 PT 的公司；

□ 由于金融行业有着很大的特殊性，且本文中需要用连续四年的数据（如前文中公式2所述，需要当年年末的财务数据并以未来三年的事后实际值代替预测值）来运用剩余收益模型计算股票的内在价值，因此所选样本公司为非金融行业上市公司，且至少有连续四年的财务报告资料和交易资料；

□ 由于净资产为负数时，无法计算公司的 *ROE*，所以公司的账面净资产须 > 0；此外，一些公司账面净资产数额极低，会导致公司的 *ROE* 数据不合理，也不应考虑在本文的研究中；另外，考虑到本文利用剩余收益模型计算股票价值的假设之一为："第三年公司所在的市场达到均衡状态"，在市场均衡状态下，公司的 *ROE* 持续地小于 0 或大于 100% 都是不现实的；因此本文中样本公司第三年的 *ROE* 范围应在 0–100% 之间；

□ 另外，考虑到数据的稳定性与合理性，在会计年度结束后六月份的最后一个交易日的股票价格过低的公司，也不应包括在本文的研究样本中。

本文中所有数据均来源于中国股票市场研究（CSMAR）数据库（2004版）。所用数据分析软件为 SPSS 13.0 及 EViews 5.0[28]。

---

[27] 之所以选用 1994 年以后的数据，一方面是因为 1994 年以前上市公司的数量太少，难以进行大样本的实证研究，另一方面，对上市公司会计处理和信息披露的大量规范出台于 1993 年，各公司公布的 1994 年及以后年度的年度报告已基本规范，数据的横向可比性加强，更有利于进行规范的研究。

[28] SPSS 13.0用于描述性统计及相关系数的计算，回归分析及其他相关工作则采用 EViews 5.0。

（五）描述性统计

本文按照研究设计中数据样本选择标准得到研究所需数据3195组：（1）1994年245组；（2）1995年226组；（3）1996年312组；（4）1997年563组；（5）1998年468组；（6）1999年642组；（7）2000年739组。

表1列示了各期的股票收益率、*V/P*比率、回归模型中的各项控制变量及与风险因素相关的各变量的描述性统计数据。

表1 各变量的描述性统计

	N	Minimum	Maximum	Median	Mean	Std. deviation
*Ret*1	3,195	−0.334376	1.052073	−0.005909	0.009809	0.111703
*Ret*3	3,195	−0.790643	1.594062	−0.004027	0.021194	0.181534
*Ret*6	3,195	−0.898747	3.075233	−0.000371	0.032237	0.236294
*Ret*12	3,195	−1.400075	6.755170	−0.006732	0.071419	0.513578
*Ret*18	3,195	−1.605177	4.572688	−0.002901	0.080990	0.553799
*Ret*24	3,195	−2.450580	16.173608	−0.004767	0.144791	0.946741
*Ret*36	3,195	−2.274638	13.925292	−0.001084	0.214969	1.069924
V/P	3,195	0.000544	9.487650	0.327355	0.449088	0.484090
LnME	3,195	10.704367	16.671560	13.583634	13.514173	0.863043
B/P	3,195	0.005308	3.917607	0.223309	0.458638	0.680525
OUTSHARE	3,195	0.037307	1.000000	0.339580	0.361509	0.133044
EPS	3,195	−2.104664	2.276996	0.273474	0.285464	0.256322
E/P	3,195	−0.420933	0.192883	0.021218	0.022944	0.027714
D/P	3,195	0.000000	0.131291	0.000000	0.007557	0.012771
Beta	3,195	−0.100686	2.060047	1.006845	1.003523	0.242007
D/M	3,195	0.005565	54.833580	0.690380	0.911666	1.341325
Z−value	3,195	−0.627522	929.438400	5.099460	10.557900	33.253100
Std*ROE*	3,195	0.004829	0.085834	0.029042	0.0288523	0.009640
AverCC	3,195	−0.020479	0.275552	0.086081	0.0857820	0.040228

四、实证结果及分析

（一）与股票价格的相关性分析

表2-1描述了股票价格与股票内在价值及账面价值的斯皮尔曼相关系数（Spearman Correlation Coefficient），其中，股票价格（P）为样本公司会计年度结束后第二年6月份最后一个交易日的股票收盘价；股票的内在价值（V）为利用剩余收益模型计算的股票内在价值；账面价值（B）直接取自CSMAR数据库中样本公司的每股净资产。

表 2-1　当期股票价格与内在价值及账面价值的相关性

年份	公司数量	B	V
1994	245	0.395***	0.426***
1995	226	0.426***	0.413***
1996	312	0.495***	0.386***
1997	563	0.338***	0.370***
1998	468	0.290***	0.282***
1999	642	0.176***	0.233***
2000	739	0.127***	0.118***
所有年份	3195	0.321	0.318

注：*** 表示 1% 的显著性水平，“所有年份”中的数据为各年平均数。

在样本期间内，每股净资产（B）与股票价格的斯皮尔曼相关系数为 0.321，意味着账面价值能解释股票价格的横截面差异的 10.3%（0.321^2）。按照本文的研究假设 H1，用剩余收益模型计算的公司权益价值（V）与股票价格的相关系数应该高于账面净资产与股票价格的相关系数。然而观察表2-1可以发现，除了 1994、1997 和 1999 年之外，其余各年 V 与股票价格的相关系数均低于同一年度 B 与股票价格的相关系数，且这三年 V 与股票价格的相关系数也仅仅略高于同一年度 B 与股票价格的相关系数；此外，V 与股票价格的相关系数的平均数为 0.318，即内在价值仅能解释股票价格变化的 10.11%，略低于账面价值的相关数据。

观察表 2-1 还可以发现一个有趣的现象：在本文的样本期间内，从 1994 年至2000年，股票价格与股票内在价值的斯皮尔曼相关系数逐步减小，这似乎说明随着时间的推移（到 2000 年为止），中国股市中的股价偏离内在价值越来越远，股价中的泡沫成分逐步增多[29]，这也是中国股市不成熟的表现之一。

以上分析说明假设H1是不正确的，即在中国资本市场中，用剩余收益模型计算的公司权益价值并不能够解释大部分股票价格的变化，而仅仅能够提供一小部分的解释，且该内在价值对当期股票价格的解释力度还略低于账面价值对当期股票价格的解释力度。这与国外相关研究（Bernard, 1995、Penman and Sougiannis, 1998 以及 Frankel and Lee, 1998a,b）的结论不一致，这可能

[29] 自2000年以来，中国股市中的股价不断下跌，说明股票价格正在逐渐向其内在价值回归，股价中的泡沫正在被逐步挤出，由此可以看出：中国股市正在不断走向成熟。关于中国股市中股票价格对内在价值的偏离及中国股市泡沫问题的研究，请参见赵志君（2003），《股票价格对内在价值的偏离度分析》，《经济研究》第 10 期，66–74；及刘煜松（2005），《股票内在投资价值理论与中国股市泡沫问题》，《经济研究》第 2 期，45–53。

是由于中国股市的成熟度较低，当期股票价格对内在价值的偏离度较高，股价中没有反映其内在价值。

基于中国股市的不成熟性，本文推测另一种可能：中国股票市场对股票内在价值中所包含的多于其账面价值信息的认识需要一个较长的时间，因此内在价值相对于账面价值对股价解释力的优越性需要滞后一段时间才能反映出来。表2-2和表2-3分别描述了一年后和两年后的股票价格与股票内在价值及账面价值的斯皮尔曼相关系数：

表 2-2 一年后的股票价格与内在价值及账面价值的年度相关性

年份	公司数量	B	V
1994	245	0.414***	0.584***
1995	226	0.396***	0.462***
1996	312	0.261***	0.438***
1997	563	0.125***	0.422***
1998	468	0.040	0.262***
1999	642	0.015	0.207***
2000	739	0.117***	0.231***
所有年份	3195	0.195	0.372

注：*** 表示 1% 的显著性水平，“所有年份”中的数据为各年平均数。

表 2-3 两年后的股票价格与内在价值及账面价值的年度相关性

年份	公司数量	B	V
1994	245	0.399***	0.686***
1995	226	0.157***	0.466***
1996	312	0.102	0.454***
1997	563	−0.590	0.417***
1998	468	−0.700	0.194***
1999	642	0.006	0.296***
2000	739	0.115***	0.392***
所有年份	3195	−0.073	0.415

注：*** 表示 1% 的显著性水平，“所有年份”中的数据为各年平均数。

由表 2-2 和表 2-3 可见，在所有年份，V 与股票价格的相关系数均高于 B 与股票价格的相关性，同时 V 与股价的相关系数的平均数也明显高于 B 与股价的相关系数的平均数。这说明用剩余收益模型计算的股票内在价值能够比账面价值更好的解释一定期间以后的股票价格，意味着运用剩余收益模型计算的内在价值在股价解释力上对账面价值的优势可能会滞后一段时间才能反映出来。

由表2-2和表2-3还可以看出，随着时间的延长，股票内在价值与股票价格的相关系数逐步增大，即二者之间的相关性逐步提高，这意味着股票价格向其内在价值的回归需要一个较长的时间过程。这可能是因为市场对股票内在价值中包含的信息做出反映需要一定的时间过程，另一方面可能也是由于中国股市的不成熟性所导致的；前一个问题存在于所有的国家，而后一个问题则存在于中国以及与中国的情况类似的发展中国家的证券市场。这就引出一个问题，前人的很多研究已经证明中国股市达到了“弱势有效”，即证券价格已经充分反映了所有历史数据中所隐含的信息，那么证券价格中应该已经包含了运用会计信息（通过剩余收益模型）所计算的公司内在价值；即使市场存在着一定的滞后期，那为什么股票价格与内在价值的相关性在一年或两年后会更高呢？这是否说明股票价格向内在价值的回归需要比以往的研究所显示的更长的时间？这一问题有待于进一步的研究。

（二）与未来股票收益的相关性

表3-1显示了模型（4）的回归结果，预测区间的取值分别为 $K=1$、3、6、12、18、24和36。

表 3-1　以 *V/P* 为自变量进行单因素回归

K	β	*t* 值	P 值	Constant	Adj.Rsq	N
1	0.024	3.810	0.000	−0.001	0.011	3195
3	0.037	4.354	0.000	0.004	0.010	3195
6	0.062	4.795	0.000	0.004	0.016	3195
12	0.197	5.554	0.000	−0.017	0.034	3195
18	0.261	6.495	0.000	−0.036	0.052	3195
24	0.612	6.685	0.000	−0.130	0.098	3195
36	0.770	6.272	0.000	−0.131	0.121	3195

注：*K*为预测期间，β为*OLS*回归的斜率系数，*t*值为斜率系数的*t*统计量的取值（正如前文所述，本表及以下各表的所有 t 统计量的值均经 Newey-West 调整），P 值为各斜率系数实际的显著性水平，Constant 为常数项的取值，Adj.Rsq 为调整的判定系数 R 平方, N 为公司数量。

表 3-1 显示了 *V/P* 比率对未来的股票收益具有较高的预测能力。在所有的预测期间，斜率系数 β 的 *t* 统计量的实际显著性水平均小于 0.01%，回归方程的调整的 R^2 从 1% 到 12.1%，意味着 *V/P* 比率能够解释未来股票收益的一部分[30]。所有预测期间的斜率系数均为正数，这说明高 *V/P* 比率能够获得较高的未来收益。观察表 3-1 还可以发现，随着预测期间的延长（K 从 1 到

[30] 在横截面数据的回归中，拟合优度调整的 *R* 平方一般都比较低，在这种情况下，研究的重点主要是变量的系数及其显著性水平。

36），斜率系数 β 的取值呈上升趋势，这从另一个侧面证明了预测期间越长，*V/P*比率对未来股票收益的预测能力就越好。同时还可以发现，斜率系数 β 的 t 统计量的取值也呈上升趋势，说明 *V/P*比率对股票收益的预测能力有随时间延长而明显增强的趋势。

在模型（4）中加入阶段虚拟变量后，模型（5）的回归结果如下所示：

表 3-2　模型（5）的回归结果

	K	1	3	6	12	18	24	36
Constant	β_0	−0.013	−0.034	−0.024	−0.233	−0.334	−0.516	−0.519
	t 值	−1.613	−1.595	−1.687	−5.482	−3.018	−2.524	−3.766
	P 值	0.107	0.111	0.092	0.000	0.003	0.012	0.000
V/P	β_1	0.023	0.039	0.068	0.203	0.271	0.610	0.739
	t 值	4.429	4.815	5.414	5.946	6.644	6.639	6.329
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
*Stage*2	α_1	0.021	−0.005	−0.048	0.010	0.109	0.275	0.526
	t 值	0.573	−0.120	−0.732	0.812	0.809	1.212	2.889
	P 值	0.567	0.905	0.464	0.417	0.419	0.226	0.004
*Stage*3	α_2	0.020	0.068	0.045	0.286	0.388	0.587	0.714
	t 值	2.138	3.061	2.781	6.014	3.412	2.731	4.952
	P 值	0.033	0.002	0.005	0.000	0.001	0.006	0.000
*Stage*4	α_3	0.015	0.044	0.051	0.273	0.368	0.534	0.366
	t 值	1.774	2.026	3.363	6.259	3.280	2.067	2.698
	P 值	0.076	0.043	0.001	0.000	0.001	0.039	0.007
*Stage*5	α_4	0.003	0.019	−0.003	0.145	0.219	0.238	0.182
	t 值	0.334	0.912	−0.186	3.399	1.955	1.125	1.339
	P 值	0.739	0.362	0.852	0.001	0.051	0.261	0.181
	Adj.Rsq	0.014	0.026	0.031	0.064	0.099	0.129	0.165
	N	3195	3195	3195	3195	3195	3195	3195

注：K 为预测期间；β_0 为常数项的取值；β_1 为 *V/P* 的斜率系数；α_1–α_4 分别为各个虚拟变量的斜率系数；t 值为常数项及各斜率系数的 t 统计量的取值；P 值为常数项及各斜率系数实际的显著性水平；Adj.Rsq 为调整的判定系数 R 平方；N 为公司数量。

表 3-2 描述了模型（5）的回归结果。该表显示，在控制了阶段性变化的影响因素之后，*V/P* 比率的斜率系数及模型的调整 R 平方均有一定程度的提高。说明在我国股市中，由于政策变化导致的阶段性变化对未来股票收益有着一定的影响。除此之外，该表显示的结果与从表 3-1 得出的结论是基本相似的。因此，本文在以下的研究中，均在模型中加入阶段虚拟变量作为控制变量[31]。

[31] 由于篇幅所限，并且考虑到阶段虚拟变量仅仅作为控制变量，因此下文研究中所列示的各项表格均没有报告阶段虚拟变量的相关数据。

（三）与股票收益有关的其他相关因素的影响

在回归模型中加入与股票收益有关的其他相关因素作为控制变量后，模型（6）的回归结果如下所示：

表 4 模型（6）的回归结果

	K	1	3	6	12	18	24	36
Constant	β_0	0.063	0.340	0.797	1.500	1.828	3.130	4.750
	t 值	1.490	4.363	8.303	6.753	7.015	7.051	9.995
	P 值	0.136	0.000	0.000	0.000	0.000	0.000	0.000
V/P	β_1	0.024	0.038	0.069	0.199	0.247	0.601	0.785
	t 值	4.476	4.742	5.375	5.700	6.257	6.475	6.463
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LnME	β_2	−0.008	−0.038	−0.077	−0.169	−0.224	−0.352	−0.467
	t 值	−2.254	−5.900	−9.830	−9.413	−12.183	−11.809	−12.570
	P 值	0.024	0.000	0.000	0.000	0.000	0.000	0.000
B/P	β_3	0.017	0.002	0.016	0.066	0.063	0.078	0.159
	t 值	3.695	0.321	1.992	4.505	4.329	2.920	4.813
	P 值	0.000	0.748	0.047	0.000	0.000	0.004	0.000
OUTSHARE	β_4	0.010	0.077	0.133	0.268	0.362	0.566	0.898
	t 值	0.534	2.776	3.964	3.435	4.848	3.894	5.419
	P 值	0.594	0.006	0.000	0.001	0.000	0.000	0.000
EPS	β_5	−0.056	−0.116	−0.023	−0.125	−0.209	−0.356	−0.370
	t 值	−3.983	−4.141	−0.771	−1.728	−2.235	−2.709	−3.118
	P 值	0.000	0.000	0.441	0.084	0.026	0.007	0.002
EPSdummy	β_6	0.040	0.095	0.103	0.206	0.408	0.491	0.137
	t 值	2.385	3.223	2.769	2.973	4.114	3.304	0.799
	P 值	0.017	0.001	0.006	0.003	0.000	0.001	0.424
E/P	β_7	0.287	0.781	0.163	2.147	4.596	5.773	1.620
	t 值	1.835	2.422	0.409	3.061	3.663	2.750	1.120
	P 值	0.067	0.016	0.683	0.002	0.000	0.006	0.263
D/P	β_8	0.480	1.771	2.411	4.355	7.914	6.895	3.003
	t 值	1.698	3.473	3.863	3.548	5.223	2.190	1.207
	P 值	0.090	0.001	0.000	0.000	0.000	0.029	0.227
D/Pdummy	β_9	0.008	0.032	0.034	0.065	0.104	0.124	0.086
	t 值	1.571	3.992	3.110	2.786	3.808	2.419	1.955
	P 值	0.116	0.000	0.002	0.005	0.000	0.016	0.051
	Adj.Rsq	0.043	0.091	0.094	0.129	0.215	0.212	0.276
	N	3195	3195	3195	3195	3195	3195	3195

注：K 为预测期间，β_0 为常数项的取值，β_1-β_9 分别为各自变量的斜率系数，*t* 值为常数项及各斜率系数的 t 统计量的取值，P 值为常数项及各斜率系数实际的显著性水平，Adj.Rsq 为调整的判定系数 *R* 平方，N 为公司数量。

表 4 显示了模型（6）的回归结果，预测区间的取值同样为 $K=1$ 、 3 、 6 、 12 、 18 、 24 和 36 。该表显示，在控制了其他相关变量的影响之后，*V/P*比率同样能够较好的预测未来的股票收益。*V/P*的斜率系数的取值在所有的预测期间同样显著大于 0，且其实际显著性水平远远低于 0.01%，而且随着时间的延长，*V/P* 的斜率系数明显增加，从 1 个月的 0.024 增大至 36 个月的 0.785 。

值得注意的是，收益价格比（*E/P*）和现金红利率（*D/P*）的斜率系数的值均高于 *V/P* 比率，但其 t 统计量的值却远远低于 *V/P* 比率的 t 统计量的值（虽然其显著性水平小于 1%），说明尽管斜率系数低于 *E/P* 和 *D/P*，但 *V/P* 比率对未来股票收益的线性作用的显著性要大大高于 *E/P* 和 *D/P*[32]，意味着就指标本身对股票收益的预测能力来说，*V/P* 比率显然更为优越，尤其在较长的预测期间内，其优越性更为明显。因此，由表 4 可以得出与前文的研究相似的结论：预测期间越长，*V/P*对股票收益的预测能力越好；且 *V/P* 比率对未来股票收益的预测能力并不是由于公司规模、账面市值比及其他相关因素的影响所导致的。

（四）风险因素的影响

Kothari（2001）认为，*V/P*之所以能够预测未来的股票收益，可能是由于在该模型中存在着某些被忽略的风险因素。但是 Frankel and Lee（1998a）以及 Ali, Hwang and Trombley（2003）则发现，在控制了风险因素的影响之后，*V/P*比率仍然与未来的股票收益高度相关。因此，该部分的研究主要检验在中国股市中，*V/P*比率对未来股票收益的预测能力是否是由于某些风险因素的影响所导致的。

1 、 *V/P* 比率与风险因素的相关性

表 5-1 和表 5-2 分别描述了 *V/P* 与一些风险因素之间的 Pearson 相关系数和 Spearman 相关系数，从而可以对 *V/P* 比率与这些风险因素之间的关系进行初步分析。

从表 5-1 和表 5-2 可以看出，*V/P* 比率与 Beta 及 Std*ROE* 有着显著的负相关系数，意味着较高的 *V/P* 有着相对较低的风险；而与 *B/P* 及 *AverCC* 的相

[32] 为了检验这一结论是否是由于变量之间可能存在的多重共线性造成的，本文做了 *V/P* 与相关变量之间的相关性分析（因篇幅所限略去），结果发现，*V/P* 与 *E/P* 、 *D/P* 存在着显著的相关关系，考虑到这一因素，本文曾尝试在模型（6）中分别去掉 *V/P* 以及 *E/P* 与 *D/P*，以检验对模型的影响。结果发现，在模型中去掉 *V/P* 后，模型的拟合优度调整的 R 平方显著降低，而去掉 *E/P* 和 *D/P* 则对模型没有特别明显的影响，由此也说明 *V/P* 对未来股票收益的预测能力要高于 *E/P* 和 *D/P* 。

表 5-1　*V/P* 比率与风险因素之间的 Pearson 相关系数

		V/P	Beta	*LnME*	*B/P*	*D/M*	*Z-value*	*StdROE*	*AverCC*
V/P	相关系数	1	−0.065**	0.017	−0.005	0.003	−0.022	−0.086**	0.0363*
	P 值（双侧）		0.000	0.349	0.770	0.886	0.214	0.000	0.039
	N	3195	3195	3195	3195	3195	3195	3195	3195
Beta	相关系数	−0.065**	1	−0.026	−0.068**	−0.044**	−0.016	0.169**	−0.056**
	P 值（双侧）	0.000		0.144	0.000	0.013	0.354	0.000	0.002
	N	3195	3195	3195	3195	3195	3195	3195	3195
LnME	相关系数	0.017	−0.026	1	−0.198**	−0.048**	0.072**	−0.451**	−0.446**
	P 值（双侧）	0.349	0.144		0.000	0.007	0.000	0.000	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
B/P	相关系数	−0.005	−0.068**	−0.198**	1	−0.021	0.027	0.294**	0.242**
	P 值（双侧）	0.770	0.000	0.000		0.234	0.130	0.000	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
D/M	相关系数	0.003	−0.044**	−0.048**	−0.021	1	−0.036*	0.017	−0.051**
	P 值（双侧）	0.886	0.013	0.007	0.234		0.039	0.351	0.004
	N	3195	3195	3195	3195	3195	3195	3195	3195
Z-value	相关系数	−0.022	−0.016	0.072**	0.027	−0.036*	1	0.009	0.055**
	P 值（双侧）	0.214	0.354	0.000	0.130	0.039		0.596	0.002
	N	3195	3195	3195	3195	3195	3195	3195	3195
StdROE	相关系数	−0.086**	0.169**	−0.451**	0.294**	0.017	0.009	1	0.517**
	P 值（双侧）	0.000	0.000	0.000	0.000	0.351	0.596		0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
AverCC	相关系数	0.0363*	−0.056**	−0.446**	0.242**	−0.051**	0.055**	0.517**	1
	P 值（双侧）	0.039	0.002	0.000	0.000	0.004	0.002	0.000	
	N	3195	3195	3195	3195	3195	3195	3195	3195

注：** 表示相关系数的显著性水平为 1%（双侧）；* 表示相关系数的显著性水平为 5%（双侧）。

表 5-2 *V/P* 比率与风险因素之间的 Spearman's 相关系数

		V/P	Beta	*LnME*	*B/P*	*D/M*	*Z-value*	*StdROE*	*AverCC*
V/P	相关系数	1.000	−0.070**	−0.009	0.237*	−0.002	−0.067**	−0.040*	0.148**
	P 值（双侧）	.	0.000	0.605	0.000	0.927	0.000	0.023	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
Beta	相关系数	−0.070**	1.000	−0.011	−0.087**	−0.026	0.005	0.151**	−0.060**
	P 值（双侧）	0.000	.	0.529	0.000	0.138	0.777	0.000	0.001
	N	3195	3195	3195	3195	3195	3195	3195	3195
LnME	相关系数	−0.009	−0.011	1.000	−0.287**	−0.065**	0.310	−0.427**	−0.474**
	P 值（双侧）	0.605	0.529	.	0.000	0.000	0.000	0.000	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
B/P	相关系数	0.237*	−0.087**	−0.287**	1.000	−0.076**	−0.121**	0.251**	0.345**
	P 值（双侧）	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
D/M	相关系数	−0.002	−0.026	−0.065**	−0.076**	1.000	−0.1814**	0.061**	−0.081**
	P 值（双侧）	0.927	0.138	0.000	0.000	.	0.000	0.001	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
Z-value	相关系数	−0.067**	0.005	0.310*	−0.121	−0.181**	1.000	−0.188	−0.052
	P 值（双侧）	0.000	0.777	0.000	0.000	0.000	.	0.000	0.003
	N	3195	3195	3195	3195	3195	3195	3195	3195
StdROE	相关系数	−0.040*	0.151**	−0.427**	0.251**	0.061**	−0.188**	1.000	0.480**
	P 值（双侧）	0.023	0.000	0.000	0.000	0.001	0.000	.	0.000
	N	3195	3195	3195	3195	3195	3195	3195	3195
AverCC	相关系数	0.148**	−0.060**	−0.474**	0.345**	−0.081**	−0.052**	0.480**	1.000
	P 值（双侧）	0.000	0.001	0.000	0.000	0.000	0.003	0.000	.
	N	3195	3195	3195	3195	3195	3195	3195	3195

注：** 表示相关系数的显著性水平为 1%（双侧）；* 表示相关系数的显著性水平为 5%（双侧）。

关系系数显著为正，意味着较高的 *V/P* 有较高的风险。由上可见，仅从相关系数的角度分析，并不能得出结论，认为高 *V/P* 比率就一定意味着高风险。因此，本文拟用上述风险因素对 *V/P* 比率进行回归分析，以便进一步考察 *V/P* 比率与风险因素的关系。结果如下所示：

表 6　以风险因素为自变量对 *V/P* 比率进行回归

	模型 7a	模型 7b	模型 7c	模型 7d
Constant	0.580**	0.467*	0.591*	0.548
	(13.404)	(2.855)	(3.026)	(2.765)
Beta	−0.131**	−0.130**	−0.074	−0.069
	(−3.265)	(−3.255)	(−1.859)	(−1.733)
LnME		0.008	0.001	0.004
		(0.709)	(0.097)	(0.318)
B/P				0.014
				(1.240)
D/M				0.003
				(0.488)
Z-value				−0.0004*
				(−2.041)
Std*ROE*			−6.638**	−6.886**
			(−6.026)	(−6.001)
AverCC			1.249**	1.274**
			(4.783)	(4.849)
Adj.Rsq	0.004	0.004	0.016	0.017
N	3195	3195	3195	3195

注：模型1、2、3、4分别表示将不同的自变量对 *V/P* 进行回归得到的结果；Constant 为常数项的取值，各自变量的斜率系数下括号内的值为其 *t* 统计量的取值，Adj.Rsq为调整的判定系数 R 平方， N 为公司数量；** 表示 1% 的显著性水平， * 表示 5% 的显著性水平（双侧）。

表 6 描述了模型（7）的回归结果。其中，模型 7a 仅将 Beta 值对 *V/P* 进行回归；模型7b将Beta值与 *LnME* 对 *V/P* 进行回归；模型7c将Beta、*LnME*、Std*ROE* 及 *AverCC* 对 *V/P* 进行回归；模型 7d 则将上述全部风险因素对 *V/P* 进行回归。在这四个模型中，它们各自的斜率系数及显著性水平都非常相似，因此这里仅讨论全部自变量的回归结果。

从表中可以看出，*AverCC* 的斜率系数显著为正（*t* 统计量的值为 4.849），意味着高 *V/P* 比率的公司风险较高，因此也就有着较高的未来收益率；但

StdROE 的值则显著为负（t 统计量的取值为 −6.001），意味着高 V/P 比率的公司风险较低，因此也就有着较低的未来收益率；因此，这一结果同表5-1和表5-2中的相关系数的分析结果一样，并不能证明高 V/P 比率的公司就有较高的风险。因此，尽管 V/P 比率和某些风险因素相关，但却不能得出结论，认为 V/P比率对股票未来收益的预测能力是由某些被忽略的风险因素所导致的。以下的分析将为这一论点提供进一步的证明。

2、以 V/P 比率作为自变量，在模型中加入风险因素作为控制变量

为了检验 V/P 比率对未来收益的预测能力是否是由于其与某些风险因素的相关性所导致的，本文在 V/P 比率的基础上，又在对未来股票收益的回归模型中加入了风险因素作为控制变量，结果如下所示：

表 7　以 V/P 与风险因素为自变量对未来股票收益进行回归

	K	1	3	6	12	18	24	36
Constant	β_0	0.180	0.520	0.986	1.450	2.067	3.650	4.940
	t 值	3.346	5.669	8.575	5.299	6.755	8.408	9.860
	P 值	0.001	0.000	0.000	0.000	0.000	0.000	0.000
V/P	β_1	0.024	0.044	0.074	0.225	0.292	0.647	0.809
	t 值	4.449	5.072	5.510	6.060	6.649	6.687	6.549
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Beta	β_2	−0.035	−0.055	−0.036	−0.029	−0.048	−0.073	−0.173
	t 值	−3.942	−3.833	−2.077	−0.811	−1.227	−1.212	−2.953
	P 值	0.000	0.000	0.038	0.417	0.220	0.226	0.003
LnME	β_3	−0.015	−0.046	−0.073	−0.150	−0.196	−0.326	−0.454
	t 值	−4.650	−7.893	−9.442	−8.145	−10.341	−11.505	−12.928
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B/P	β_4	0.014	−0.005	0.020	0.055	0.071	0.076	0.086
	t 值	2.682	−0.721	2.340	2.971	3.462	2.373	2.335
	P 值	0.007	0.471	0.019	0.030	0.001	0.018	0.020
D/M	β_5	0.003	0.008	0.008	0.009	0.013	0.016	0.002
	t 值	1.436	1.502	1.664	1.363	1.499	1.190	0.266
	P 值	0.151	0.133	0.096	0.173	0.134	0.234	0.790
Z-value	β_6	−6E-0.6	−2E-0.5	−0.0002	−0.0005	−0.0003	−0.0009	−0.001
	t 值	−0.152	−0.246	−1.601	−1.846	−0.706	−1.792	−2.831
	P 值	0.879	0.806	0.109	0.065	−0.480	0.073	0.005
Std*ROE*	β_7	0.390	1.405	−1.234	4.478	0.707	1.704	15.220
	t 值	0.727	1.747	−1.315	1.729	0.242	0.417	3.321
	P 值	0.467	0.081	0.189	0.084	0.809	0.677	0.001

表 7 续

	K	1	3	6	12	18	24	36
AverCC	β_8	0.009	0.032	−0.200	−0.293	−0.165	−1.431	−2.981
	t 值	0.093	0.221	−1.302	−0.879	−0.470	−2.488	−3.521
	P 值	0.926	0.825	0.193	0.379	0.639	0.013	0.000
	Adj.Rsq	0.034	0.062	0.079	0.113	0.161	0.189	0.267
	N	3195	3195	3195	3195	3195	3195	3195

注：K 为预测期间，β_0 为常数项的取值，β_1–β_8 分别为各自变量的斜率系数，t 值为常数项及各斜率系数的 *t* 统计量的取值，P 值为常数项及各斜率系数实际的显著性水平，Adj.Rsq 为调整的判定系数 R 平方，N 为公司数量。

从表 7 可以看出，在控制了风险因素的影响之后，*V/P* 比率的斜率系数仍然显著为正；而且随着预测期间的延长，斜率系数逐步增大（从 1 个月的 0.082 增至 36 个月的 1.133）；斜率系数的显著性水平均小于 0.01%，且其 t 统计量的值也随时间的延长而增加，从 1 个月的 6.824 增至 36 个月的 10.588。这再次验证了上述的结论，即随着预测期间的延长，*V/P* 比率对未来股票收益的预测能力明显增强。

另外，注意到 Std*ROE* 及 *AverCC* 的斜率系数及其 t 统计量的值在预测期间内极不稳定，因此可以认为这两个变量虽然与未来的股票收益相关，但是其并不具备对未来股票收益进行预测的能力；*LnME* 及 *B/P* 的斜率系数及其 t 统计量的值则验证了中国股市中存在着一定的小公司效应及 *B/P* 效应；观察其他风险因素的斜率系数及其实际显著性水平可以发现，Beta 的斜率系数的 t 统计量的值仅在较短的期间内（六个月内）在 5% 的水平显著，当预测期间大于六个月时，其斜率系数的值变得不再显著，说明由 Beta 值所代表的公司风险仅仅能够预测未来短期内的收益（预测期间小于一年），时间越长，其准确性越差；而 D/M 和 *Z-value* 的斜率系数几乎在所有的预测期间均不显著，说明公司的财务风险与未来的股票收益基本没有相关性。

总之，以上数据及相关分析进一步证明了假设 H4.2 的正确，即 *V/P* 比率对未来收益的预测能力并不是由于其与某些风险因素的相关性所导致的，在控制了风险因素的影响之后，运用剩余收益模型计算的 *V/P* 比率仍然表现出对未来股票收益的较强的预测能力。

（五）稳健性检验

前文已经提到，股票收益率的计算方法有很多种，为了保证本文的结论不受股票收益率计算方法的影响，我们在这里使用 Fama and French （1988a,b,

1989）使用的连续复利计算的股票收益率代替BHR进行稳健性检验[33]。结果如表8-1所示：在所有的预测期间，在控制了前文提到的相关因素之后，在使用连续复利计算的股票收益率代替BHR作为因变量的情况下，*V/P*比率的斜率系数均显著为正，而且随着预测期间的延长而增加。这说明前文的结论不受股票收益率计算方法的影响。

表 8-1 使用连续复利计算的收益率代替 *BHR* 进行稳健性检验

K	β	*t* 值	*P* 值	Adj.Rsq	N
1	0.021	4.410	0.000	0.053	3195
3	0.036	4.846	0.000	0.114	3195
6	0.060	5.948	0.000	0.146	3195
12	0.125	6.459	0.000	0.216	3195
18	0.185	7.338	0.000	0.308	3195
24	0.297	8.893	0.000	0.348	3195
36	0.378	9.638	0.000	0.368	3195

注：K为预测期间，β为*V/P*比率的斜率系数，*t*值为该斜率系数的*t*统计量的取值，P值为该斜率系数实际的显著性水平，Adj.Rsq为调整的判定系数*R*平方，N为公司数量。

考虑到许多外部变量对估值模型有着一定的影响，并且本文的样本公司属于不同的年份，因此本文还进行了以下两种稳健性检验：

（1）在模型中加入以下虚拟变量：☐ 行业虚拟变量，将所有样本公司分为五个大类行业，即工业、公用事业、房地产业、综合类和商业，据此设置四个行业虚拟变量，分别为Utility、Property、Conglomerate和Commerce，当样本公司属于某一行业时，该行业的虚拟变量取值为1，否则取值为0[34]；☐ 上市地点的虚拟变量District，当样本公司在深市上市时取值为1，在沪市上市时取值为0；☐ 股市状态虚拟变量Bull，当样本公司处于牛市状态时，该虚拟变量取值为1，处于熊市状态时，则取值为0[35]；☐ 股票是否为基金所持

[33] 稳健性检验的模型中包括了所有的控制变量及风险变量，预测期间K的取值同样从1到36，由于篇幅所限，稳健性检验的相关表格只列示了*V/P*比率的斜率系数及其t统计量，而并未列示其他控制变量的相关数据。

[34] 之所以没有按前文计算行业平均资本成本时所采用的12个大类行业进行检验，是由于12个大类行业中的某些行业的样本公司数量太少，难以进行大样本的实证分析。

[35] 对于股市中牛市和熊市状态的划分，本文对深市和沪市分别进行分析，分析方法同前文划分阶段的方法。同样，本文在分析后发现，深市和沪市处于牛市和熊市的期间基本相同，因此在检验时，不再区分深市和沪市。根据股市价格的波动情况，当股市处于上升阶段时，为牛市，处于下降阶段时，为熊市。具体划分为：1994年9月至1996年1月、1997年5月至1999年5月、以及2001年6月至2002年1月处于牛市阶段，其余则为熊市阶段。

有的虚拟变量 Fund，当某一年样本公司的十大股东中有基金时，该变量取值为 1，否则取值为 0 。

（2）将样本公司按其所属年份进行分年度回归。

两种稳健性检验的结果分别如表 8-2 和表 8-3 所示：

表 8-2　在回归模型中加入上市地虚拟变量和行业虚拟变量进行稳健性检验

	K	1	3	6	12	18	24	36
V/P	β_1	0.022	0.035	0.055	0.193	0.238	0.603	0.811
	t 值	3.809	4.072	4.356	5.302	5.959	6.455	6.554
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Utility	α_2	−0.006	−0.034	−0.033	0.001	−0.025	−0.020	−0.020
	t 值	−0.619	−2.358	−2.714	0.046	−0.844	−0.479	−0.437
	P 值	0.536	0.001	0.007	0.963	0.399	0.632	0.662
Property	α_3	0.003	−0.052	−0.040	−0.002	−0.021	−0.005	−0.153
	t 值	0.235	−2.735	−1.223	−0.028	−0.311	−0.066	−1.893
	P 值	0.814	0.006	0.221	0.978	0.756	0.947	0.059
Conglomerate	α_4	−0.011	−0.019	−0.024	−0.010	0.001	0.019	−0.037
	t 值	−2.110	−2.306	−2.237	−0.420	0.055	0.471	−0.892
	P 值	0.035	0.021	0.025	0.675	0.956	0.637	0.372
Commerce	α_5	−0.007	−0.011	−0.030	−0.035	−0.053	−0.080	−0.107
	t 值	−1.150	−0.891	−1.803	−1.035	−1.550	−1.526	−1.769
	P 值	0.250	0.373	0.071	0.301	0.121	0.127	0.077
District	α_6	0.010	−0.001	0.021	0.050	0.084	0.122	0.061
	t 值	1.599	−0.175	1.822	2.179	3.513	3.096	1.692
	P 值	0.110	0.861	0.069	0.029	0.000	0.002	0.091
Bull	α_7	0.015	0.005	0.033	0.111	0.159	0.180	0.119
	t 值	1.508	0.372	1.586	2.836	3.606	2.607	1.873
	P 值	0.132	0.710	0.113	0.005	0.000	0.009	0.061
Fund	α_8	0.001	0.012	0.021	0.029	0.020	0.025	0.042
	t 值	0.147	1.670	2.405	1.616	1.065	0.918	1.497
	P 值	0.883	0.095	0.016	0.106	0.287	0.359	0.135
	Adj.Rsq	0.048	0.069	0.069	0.081	0.126	0.167	0.247
	N	3195	3195	3195	3195	3195	3195	3195

注：K 为预测期间，β_1 为 *V/P* 的斜率系数，α_2–α_8 分别各控制变量的斜率系数，t 值为各斜率系数的 t 统计量的取值，P 值为各斜率系数实际的显著性水平，Adj.Rsq 为调整的判定系数 R 平方，N 为公司数量。

表 8-3　分年度回归结果

	K	1	3	6	12	18	24	36
Panel A	β_1	−0.005	−0.016	0.069	0.834	1.672	5.508	4.509
1994 年	t 值	−0.195	−0.237	0.907	3.572	5.762	5.099	5.758
回归	P 值	0.846	0.813	0.365	0.000	0.000	0.000	0.000
	Adj.Rsq	0.084	0.208	0.215	0.390	0.591	0.526	0.461
	N	245	245	245	245	245	245	245
Panel B	β_1	0.058	0.083	0.125	0.432	0.449	0.794	1.705
1995 年	t 值	2.783	2.311	2.238	3.499	3.794	5.143	4.335
回归	P 值	0.006	0.022	0.026	0.001	0.000	0.000	0.000
	Adj.Rsq	0.271	0.231	0.270	0.223	0.227	0.347	0.465
	N	226	226	226	226	226	226	226
Panel C	β_1	0.015	0.118	0.211	0.498	0.561	1.778	1.723
1996 年	t 值	1.099	2.864	2.488	3.388	4.228	6.215	5.723
回归	P 值	0.273	0.005	0.013	0.001	0.000	0.000	0.000
	Adj.Rsq	0.061	0.280	0.200	0.335	0.380	0.446	0.426
	N	312	312	312	312	312	312	312
Panel D	β_1	0.019	0.040	0.063	0.253	0.286	0.796	0.909
1997 年	t 值	2.772	2.797	3.574	3.650	4.429	5.632	5.316
回归	P 值	0.006	0.005	0.000	0.000	0.000	0.000	0.000
	Adj.Rsq	0.069	0.222	0.164	0.099	0.164	0.266	0.404
	N	563	563	563	563	563	563	563
Panel E	β_1	0.049	0.052	0.103	0.294	0.373	0.469	0.467
1998 年	t 值	2.188	2.110	2.463	4.075	5.465	6.386	6.241
回归	P 值	0.029	0.035	0.014	0.000	0.000	0.000	0.000
	Adj.Rsq	0.090	0.174	0.200	0.188	0.304	0.364	0.249
	N	468	468	468	468	468	468	468
Panel F	β_1	0.018	0.034	0.041	0.105	0.199	0.228	0.431
1999 年	t 值	1.625	1.905	1.630	2.971	5.013	5.778	8.786
回归	P 值	0.105	0.057	0.104	0.003	0.000	0.000	0.000
	Adj.Rsq	0.105	0.132	0.202	0.276	0.231	0.237	0.244
	N	642	642	642	642	642	642	642
Panel G	β_1	0.005	0.014	0.025	0.045	0.064	0.132	0.155
2000 年	t 值	1.566	2.951	4.053	4.004	4.515	5.265	5.725
回归	P 值	0.118	0.003	0.000	0.000	0.000	0.000	0.000
	Adj.Rsq	0.054	0.041	0.080	0.108	0.085	0.233	0.341
	N	739	739	739	739	739	739	739

注：K 为预测期间， Panel A–Panel G 分别为运用 1994–2000 年数据进行分年度回顾的结果；由于篇幅所限，本表中只列示 *V/P* 的相关数据；β_1 为运用各年度数据进行回归的 *V/P* 的斜率系数， t 值为 *V/P* 的斜率系数的 t 统计量的取值，P 值为 *V/P* 的斜率系数实际的显著性水平， Adj.Rsq 为调整的判定系数 R 平方，N 为公司数量。

由表8-2可以看出，在加入各个虚拟变量后，对本文的主要结论几乎没有影响；在所有的预测期间，*V/P*比率的斜率系数均显著为正，而且随着预测期间的延长而增加；观察各个虚拟变量的斜率系数则可以发现，在大部分的预测期间，他们的t统计量都是不显著的，说明这些外部变量对股票未来收益的横截面差异没有太大的影响。

在对不同年度的样本公司进行分年度回归后，我们发现：在预测期间 K 大于 6 个月时，所有年度的数据均显示 *V/P* 的斜率系数均显著为正（P 值均小于 1%），并且随着预测期间的延长而增加，这和我们前文的主要结论也是基本一致的。而在 K 小于等于 6 个月时，各个年度的情况则有所不同，这也正说明了 *V/P*比率对未来较长时期的股票收益有着较好的预测能力，对未来短期股票收益的预测则未必准确。

总之，所有稳健性检验的结果均和前文的主要结论是一致的，这从另一个方面进一步验证了本文的结论。

（六）与自由现金流模型的比较

国外大量研究认为，与自由现金流模型及股利折现模型相比，剩余收益模型具有明显的优越性（Bernard, 1995; Penman and Sougiannis, 1998; Frankel and Lee, 1998a,b; Francis, Olsson and Oswald, 2000）。为了检验这一结论在中国股市是否成立，本文在这一部分将进行模型间的比较。参照 Copeland, Koller, and Murrin （1994）的研究以及国内的实际情况，本文按照如下公式确定企业的股权价值[36]：

$$股权价值 = \sum_{t=1}^{\infty} \frac{股权现金流量}{(1+权益资本成本)^t} + 当期超额现金$$

其中，权益资本成本按照 CAPM 确定；当期超额现金则参照 Copeland, Koller, and Murrin （1994）及 Francis, Olsson and Oswald （2000）的研究，确定为超过企业主营业务收入 2% 的货币资金和有价证券。

考虑到股利折现模型以自由现金流模型为基础，在数据假设相同的情况下，二者的评估结果是相同的。在国内的实务中，由于股利分配政策有较大的随意性，股利折现模型很少被使用。股权现金流模型可以取代股利折现模型，避免对股利政策进行预测的麻烦。因此本文只对剩余收益模型和自由现金流模型进行了比较。

[36] 由于缺少有关债务成本的数据，使得计算加权平均资本成本受到影响，因此本文采用股权现金流模型进行相关检验，从理论上来说，其计算结果与实体自由现金流模型是相同的。

和剩余收益模型一样，由于缺少有关的预测数据，本文采用三期实际数据的模型来预测股票价值；对于第三期以后的股权自由现金流，本文使用前三期自由现金流的算术平均值作为第三期以后的预测值[37]。本文使用的自由现金流模型的具体公式如下：

$$股权价值 = 当期超额现金 + \sum_{t=1}^{3} \frac{股权自由现金流量}{(1+权益资本成本)^t} + \frac{前三期股权现金流量的算术平均值/(权益资本成本-增长率)}{(1+权益资本成本)^3}$$

为了检验两种模型对当期股票价格的解释力，我们首先比较了剩余收益模型及自由现金流模型与当期股票价格的相关系数。结果如下所示：

表 9　RIM 与 DCF 的相关系数比较

年份	公司数量	V(DCF)	V(RIM)
1994	245	0.296**	0.426***
1995	226	0.026**	0.413***
1996	312	−0.038	0.386***
1997	563	0.013	0.370***
1998	468	0.023	0.282***
1999	642	−0.044	0.233***
2000	739	0.043	0.118***
所有年份	3195	0.046	0.318

注：*** 表示 1% 的显著性水平，“所有年份”中的数据为各年平均数；V(DCF)一列表示用自由现金流模型计算的股票价值与当期股票价格的相关系数；V(RIM)一列表示用剩余收益模型计算的股票价值与当期股票价格的相关系数。

从表 9 可以发现，无论是各个年份的数据还是全部年份的数据，自由现金流模型对当期股价的解释力都要远低于剩余收益模型；从全部样本期间来看，自由现金流模型仅能够解释股票价格的 0.212%，而剩余收益模型则可提

37 在自由现金流模型中，投资越多，自由现金流越少，公司价值越低。典型的例子是美国的沃尔玛公司。由于其经营的成功，沃尔玛公司在全球的扩张力度很强，这就需要大量的利润被投资到新的项目中去。实际上，沃尔玛公司的自由现金流近年来一直是负数。自由现金流模型根本就无法应用，这也是自由现金流模型的一大缺陷之一，有鉴于此，对于三期自由现金流的算术平均值为负数的公司，本文在计算中令其为零，以保证数据的合理性，具体参见 Francis, Olsson and Oswald （2000）。

供10.11%的解释力；因此我们可以得出初步的结论，在对股价的解释及预测能力上，剩余收益模型要远优于自由现金流模型[38]。

在相关系数检验的基础上，本文采用回归分析的方法，进一步比较了两种模型对未来股票收益的预测能力。回归模型如下所示：

$$r(t,t+K)=\beta_0+\beta_1 V(RIM)/P+V(DCF)/P+\alpha+e_{t+K,t}$$

其中， $V(RIM)/P$ 表示用剩余收益模型计算的 V/P 比率；

$V(DCF)/P$ 表示用自由现金流模型计算的 V/P 比率；

α 则包括了本文提到的所有控制变量。

该模型的回归结果如下所示[39]：

表 10　两种模型对未来股票收益预测能力的比较

	K	1	3	6	12	18	24	36
$V(RIM)/P$	β_1	0.022	0.035	0.061	0.189	0.233	0.566	0.759
	t 值	3.948	4.188	4.672	5.319	5.920	6.296	6.128
	P 值	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$V(DCF)/P$	β_2	−0.006	−0.006	−0.006	0.053	0.061	0.140	0.169
	t 值	−0.770	−0.480	−0.365	1.248	1.357	1.045	1.497
	P 值	0.441	0.631	0.716	0.212	0.175	0.296	0.134
	Adj.Rsq	0.050	0.095	0.099	0.129	0.210	0.225	0.289
	N	3195	3195	3195	3195	3195	3195	3195

注：K 为预测期间， β_1 为 $V(RIM)/P$ 的斜率系数， β_2 为 $V(DCF)/P$ 的斜率系数， t 值为各斜率系数的 t 统计量的取值，P 值为各斜率系数实际的显著性水平；Adj.Rsq 为调整的判定系数 R 平方， N 为公司数量。

从上表可以看出，无论是短期还是长期，剩余收益模型对未来股票收益的预测能力都要远优于自由现金流模型，这一结论同国外的相关研究是一致的。

五、研究结论

本文利用中国股市 1994–2004 年的数据，实证检验了运用 Feltham-Ohlson 剩余收益模型计算的 V/P 比率对中国股市中未来股票收益的预测能

[38] 为了检验两种模型对未来股票价格的预测能力，本文还分别比较了剩余收益模型及自由现金流模型与一年后及两年后股票价格的相关系数，结果得出了相同的结论，由于篇幅所限略去。

[39] 由于篇幅所限，本文在表格中只列示了 $V(RIM)/P$ 及 $V(DCF)/P$ 的相关数据，其他控制变量的数据则未列出。

力。结果证明*V/P*比率确实能够比较好地预测未来的股票收益；而且在本文的样本期间内，预测期间越长，预测的效果越好。本文的主要研究结论是：

□ 虽然利用剩余收益模型计算的公司股票价值与当前股票价格的相关性不高，但随着时间的延长，这一内在价值与股票价格的相关性不断得到提高；

□ 利用剩余收益模型计算的 *V/P* 比率与未来的股票收益有着较高的相关性，时间越长，其对股票收益的预测能力也越好；

□ 剩余收益模型对未来股票收益的预测能力并不是由于公司规模（ME）、账面市值比（*B/P*）或其他相关因素的影响所导致的；

□ *V/P* 比率虽然和某些风险因素相关，但它对股票收益的预测能力并不是由于其与这些风险因素的相关性所导致的。

另外，国外的相关研究表明，剩余收益模型对未来股票收益的预测能力主要源于模型中分析师对公司未来收益的预测；但本文并未使用分析师的预测，同样得出了显著的结论，这是否说明除了分析师的预测外，还有其他因素影响着剩余收益模型对股票收益的预测能力呢？这一问题还有待于后来的研究。

参考文献

陈晓，陈小悦，刘钊. 1999. A 股盈余报告的有用性研究 — 来自上海、深圳股市的实证证据.《经济研究》第 6 期， 21–28.

陈信元，陈冬华，朱红军. 2002. 净资产、剩余收益与市场定价：会计信息的价值相关性.《金融研究》第 4 期, 59–70.

陈信元，张田余，陈冬华. 2001. 预期股票收益的横截面多因素分析：来自中国证券市场的经验证据.《经济研究》第 6 期， 22–35.

贾权，陈章武. 2003. 中国股市有效性的实证分析.《金融研究》第 7 期， 86–92.

陆静，孟卫东，廖刚. 2002. 上市公司会计盈利、现金流量和股票价格的实证研究.《经济科学》第 5 期， 34–42.

陆蓉，徐龙炳. 2004. “牛市”和“熊市”对信息的不平衡性反应研究.《经济研究》第 3 期， 65–72.

陆璇，陈小悦， 张岭松 等. 2001. 中国上市公司财务信息对未来收益的预测能力.《经济科学》第 6 期， 53–62.

陆宇峰. 1999. 净资产倍率和市盈率的投资决策有用性 — 基于“费森—奥尔森估值模型”的实证研究. 上海财经大学博士论文.

宋剑峰. 2000. 净资产倍率、市盈率与公司的成长性 — 来自中国股市的经验证据.《经济研究》第 8 期， 36–45.

苏宝通，陈炜. 2004. 中国股市股票回报率的实证研究. 2004 国际金融年会论文.

苏冬蔚，麦元勋. 2004. 流动性与资产定价：基于我国股市资产换手率与预期收益的实证研究. 2004 国际金融年会论文.

孙爱军，陈小悦. 2002. 关于会计盈余的信息含量的研究 — 兼论中国股市的利润驱动特性.《北京大学学报（哲学社会科学版)》第 1 期， 15–27.

孙铮，李增泉. 2001. 收益指标价值相关性实证研究. 《中国会计与财务研究》第3卷第2期， 1– 37.

王化成，程小可，佟岩. 2004. 经济增加值的价值相关性. 《会计研究》第5期，75–81.

许年行，吴世农. 2004. 资产的理性定价模型和非理性定价模型的比较研究 — 基于中国股市的实证分析. 2004 国际金融年会论文.

赵志君. 2003. 股票价格对内在价值的偏离度分析. 《经济研究》第10期， 66–74.

赵宇龙. 1998. 会计盈余披露的信息含量 —来自上海股市的经验证据.《经济研究》第7期， 41–49.

周建波. 2004. 基本财务信息、盈利质量与未来盈利 — 来自中国股上市公司的经验证据. 《中国会计与财务研究》第1期， 41–65.

朱世武，郑淳. 2003. 中国资本市场股权风险溢价研究. 《世界经济》第11期，62–80.

Abarbanell, J. and Bernard, V. (1995), 'Is the US stock market myopic?' *Working Paper*, University of Michigan, January.

Ali, A., Lee-Seok Hwang, and M. Trombley (2003), 'Residual-Income-Based valuation predicts future stock return: Evidence on mispricing vs. risk explanations', *The Accounting Review* 78: 377–396.

Altman, E. (1968), 'Financial ratios, discriminant analysis and the prediction of corporate bankruptcy', *Journal of Finance* 23: 589–609.

Ball, R. and Brown, P. (1968), 'An empirical evaluation of accounting income numbers', *Journal of Accounting Research* 6: 159–178.

Beaver, W. H. (1968), 'The information content of annual earnings announcements', *Journal of Accounting Research* (*Supplement 1968*), 67–92.

Beaver, W. H. (2002), 'Perspectives on recent capital market research', *The Accounting Review* 77: 453–474.

Bernard, V. (1994), 'Accounting-based valuation methods, determinants of market-to-book ratios, and implications for financial statement analysis', *Working Paper*, University of Michigan, January.

Bernard, V. (1995), 'The Feltham-Ohlson framework: Implications for empiricists', *Contemporary Accounting Research* 11: 733–747.

Campbell, John, Y. (1993), 'Why long horizons? A study of power against persistent alternatives', *Working Paper*, NBER and Princeton University, September.

Copeland, T., Koller, T., and Murtin, J. (1994), *Valuation: Measuring and Managing the Value of Companies*, 2d ed, New York: Wiley.

Damodaran, A. (2000), 'Estimating Equity Risk Premiums', *Working paper*, Stern School of Business.

Dechow, P., Hutton, A., and Sloan, R. (1999), 'An empirical assessment of the residual income valuation model', *Journal of Accounting and Economics* 26: 1–34.

Edwards, E. and Bell, P. (1961), *The Theory and Measurement of Business Income*, Berkeley, CA, University of California Press.

Fairfield, P. (1994), 'P/E, P/B and the present value of future dividends'. *Financial Analysts Journal July/Aug*, 23–31.

Fama, Eugene F. and Kenneth R. French (1988a), 'Dividend yields and expected stock returns', *Journal of Financial Economics* 22: 3–25.

Fama, Eugene F. and Kenneth R. French (1988b), 'Permanent and temporary components of stock prices', *Journal of Political Economy* 96: 246–273.

Fama, Eugene F. and Kenneth R. French (1989), 'Business conditions and expected returns on stocks and bonds', *Journal of Financial Economics* 25: 23–50.

Fama, Eugene F. and Kenneth R. French (1992), 'The Cross-section of Expected Stock Returns', *Journal of Finance* 47: 427–465.

Fama, Eugene F. and Kenneth R. French (1993), 'Common Risk Factors in the Returns on Stocks and Bonds', *Journal of Financial Economics* 33: 3–56.

Fama, Eugene F. and Kenneth R. French (1996), 'Multifactor Explanations of Asset Pricing Anomalies', *Journal of Finance* 51: 55–84.

Feltham, G. and Ohlson, J. (1995), 'Valuation and clean surplus accounting for operating and financial activities', *Contemporary Accounting Research* 11: 689–731.

Feltham, G. and Ohlson, J. (1996a), 'Uncertainty resolution and the theory of depreciation measurement', *Journal of Accounting Research* 34: 209–234.

Feltham, G. and Ohlson, J. (1996b), 'A no arbitrage valuation model based on anticipated realizations of accounting data', *Working Paper*, UBC, British Columbia, Canada.

Feltham, G. and Ohlson, J. (1997), 'Valuation, clean surplus accounting, and anticipated equity transactions', *Working Paper*, UBC, British Columbia, Canada.

Francis, J., Olsson, P., and Oswald, D. (2000), 'Comparing the accuracy and explainability of dividend, free cash flow and abnormal earnings equity valuation models', *Journal of Accounting Research* 38: 45–70.

Frankel, R. and Lee, C. (1998a), 'Accounting valuation, market expectation, and cross-sectional stock returns', *Journal of Accounting and Economics* 25: 283–319.

Frankel, R. and Lee, C. (1998b), 'Accounting diversity and international valuation', *Working Paper*, University of Michigan and Cornell University, January.

Herzberg, M. M. (1998), 'Implementing EBO/EVA analysis in stock selection', *The Journal of Investing* 7 (1): 45–53.

Kothari, S. P. (2001), 'Capital markets research in accounting', *Journal of Accounting and Economics* 31: 105–232.

Lee, C., Myers, J., and Swaminathan, B. (1999), 'What is the intrinsic value of the Dow?' *Journal of Finance* 54: 1693–1741.

Lo, K. and Lys, T. (2000), 'The Ohlson model: Contribution to valuation theory, limitations and empirical applications', *Journal of Accounting, Auditing and Finance* 15: 337–367.

Newey, W. and West, K. (1987), 'Hypothesis testing with efficient method of moments estimation', *International Economic Review* 28: 777–787.

Ohlson, J. (1990), 'A synthesis of security valuation theory and the role of dividends, cash flows, and earnings', *Contemporary Accounting Research* 7: 648–676.

Ohlson, J. (1991), 'The theory of value earnings, and an introduction to the Ball-Brown analysis', *Contemporary Accounting Research* 8: 1–19.

Ohlson, J. (1995), 'Earnings, book values and dividends in equity valuation', *Contemporary Accounting Research* 11: 661–687.

Peasnell, K. (1982), 'Some formal connections between economic values and yields and accounting numbers', *Journal of Business Finance and Accounting* 9 (3): 361–381.

Penman, Stephen. H. (2001), 'Financial Statement Analysis & Security Valuation', *McGraw-Hill.*

Penman, S. and Sougiannis, T. (1998), 'A comparison of dividend, cash flow and earnings approaches to equity valuation', *Contemporary Accounting Research* 15: 343–383.

Preinreich, G. (1938), 'Annual survey of economic theory: the theory of depreciation', *Econometrica* 6: 219–241.

SFAC3 (1980), Elements of Financial Statements of Business Enterprises, *FASB.*

2006年6月 第8卷 第2期
中 国 会 计 与 财 务 研 究
China Accounting and Finance Review
Volume 8, Number 2, June 2006

AN EMPIRICAL STUDY ON THE PREDICTIVE POWER OF STOCK RETURNS BASED ON THE RESIDUAL INCOME VALUATION MODEL[1]

Zhong Ma[2] and Lan Zhang[3]

ABSTRACT

This paper, based on data from Chinese A-share listed companies from 1994 to 2004, empirically investigates the power of the Feltham-Ohlson's residual income valuation model in predicting future cross-sectional stock returns. Unlike the current literature in China, this study uses "comprehensive income" to compute a stock's intrinsic value to satisfy the clean surplus relation (CSR) required by the residual income valuation model. With respect to research method, we use the multi-period forecasting regression test adopted by Fama and French (1988a,b; 1989) to strengthen the reliability of this study after controlling for certain related factors. We find (1) that the predictive power of the residual income model is clearly higher than other variables with extended forecasting horizons (beyond 12 months), although many other factors may affect future cross-sectional stock returns, and (2) that the residual income model remains highly correlated with future stock returns when certain related factors are controlled. The evidence suggests that the residual income valuation model, as compared with some traditional accounting and financial indicators, is a better predictor of future cross-sectional stock returns for the Chinese stock market; moreover, its predictive power for future stock returns grows stronger over longer horizons (beyond 12 months) and remains effective after controlling for certain related factors.

Keywords: Residual Income Valuation Model, Stock Returns, Predictive Power

---

[1] The authors appreciate the constructive suggestions and comments made by the two anonymous referees and Professor Wayne Yu, the executive editor of *China Accounting and Finance Review*. We are responsible for all viewpoints and errors in this paper.

[2] Zhong Ma, Associate Professor, Department of Accounting and Finance, School of Economics and Management, Beijing Jiaotong University, Beijing (100044), P. R. China. E-mail: zhma@bjtu.edu.cn.

[3] Lan Zhang, graduate student, Department of Accounting and Finance, School of Economics and Management, Beijing Jiaotong University, Beijing (100044), P. R. China. E-mail: Czzhangl@163.com.

I. INTRODUCTION

The usefulness of accounting information for investment decision-making, which can be explained using a comprehensive valuation model, has always been the focus of accounting research in the securities market. The valuation model stems from the theory of Discounted Cash Flow (DCF), from which the Free Cash Flow Model (FCF) and the Dividend Discount Model (DDM) are derived. But the FCF and DDM models have their inherent flaws. First, the data used in valuation are far from adequate; in particular, due regard has not been paid to some of the current and future value information on firms shown in the financial reports. And second, these models are constructed from the perspective of value distribution (dividends) instead of value creation. Thus, these models require further improvement to be used for valuation.

Feltham and Ohlson have constructed a residual income valuation (RIV) model based on the traditional dividend discount model and the concept of value creation. The RIV model combines stock value, equity book value, and future earnings for the first time, thus establishing the direct role of accounting book figures in determining the intrinsic value of stocks. This also indicates the relationship between accounting information and stock prices, an issue that has never been addressed, hence laying a sound foundation for future related research.

The residual income valuation model is of great significance for empirical researchers, since it creates a new theoretical framework for accounting data and firm value; thus, it is more conducive to exploring further the relationship between current accounting information and stock prices or returns. Over the past decade or so, a large body of literature on the RIV model has been published in top-tier foreign academic journals. Many studies (Bernard, 1995; Penman and Sougiannis, 1998; Frankel and Lee, 1998a; Francis *et al.*, 2000; etc.) indicate that the RIV model is significantly superior to the traditional FCF and DDM models, both in terms of the interpretation of stock prices and the accuracy of the value calculated in accordance with the models. To further explore the application of the RIV model to capital markets, the predictive power of the model for future stock returns has been studied based on the securities markets of developed countries. The results show similar conclusions: the RIV model better predicts future stock returns and is effective in helping investors make investment decisions.

The emerging nature of the Chinese stock market requires a better model to assess the basic value of shares and to reasonably assess expected returns to help investors make rational decisions. Although relevant studies have demonstrated that the accounting information in the Chinese capital market is rather useful (Zhao, 1998; Chen *et al.*, 1999; Sun and Chen, 2002) and that it is possible to use the RIV model in China (Lu, 1999; Song, 2000; Chen *et al.*, 2002; Lu *et al.*, 2002), these studies, which are based on the Chinese securities market, do not test the predictive power of the RIV model for cross-sectional stock returns, nor do they satisfy the "clean surplus relation" (CSR) in the valuation based on the RIV model. Therefore, this paper, by adopting "comprehensive income" to meet the CSR, studies the following two issues: first, whether the RIV model can predict future stock returns in China; and second, if the answer is positive, whether the predictive ability is a result of the impact of other factors (such as company size, *E/P*, *B/P*, neglected risk factors, etc.).

The remainder of the paper is organised as follows: section 2 reviews other relevant and important literature; section 3 describes the methodology, including the research model, research methods, hypotheses, data sources, and sample selection; section 4 presents the empirical results and analysis by showing the relevant data, data processing results, and comparisons; and section 5 summarises the research conclusions based on the empirical results and also points out directions for future study.

II. LITERATURE REVIEW

As early as 1968, Ball and Brown (1968) and Beaver (1968) first studied the relationship between accounting information and stock prices from the perspective of information; in subsequent decades this became the leading topic of research in the securities market. From the late 1980s to the early 1990s, the assumption of all relevant studies in this area that stock market pricing is effective was constantly challenged; since then, research interest has shifted to the measurement of the intrinsic value of stocks.

The RIV model, put forward by Ohlson (1990, 1991, 1995) and Feltham and Ohlson (1995, 1996, 1997), has laid a solid foundation for study from the perspective of measurement. The model establishes a new and important theoretical framework for the relationship between accounting data and firm value. As Bernard (1995) puts it, the RIV model proposed by Feltham and Ohlson

> "stand[s] among the most important developments in capital markets research in the last several years. The studies proved a foundation for redefining the appropriate objective of research on the relation between financial statement data and firm value. At the same time, they provide some structure for modelling in a field where structure has been sorely lacking. The value of Ohlson (1995) and Feltham and Ohlson (1995) can best be appreciated when one recognizes where the studies fit on the evolutionary tree of research, . . . [they] represent the base of a branch that capital markets research might have followed, but did not . . . . In a sense they return to 'step one' and attempt to build a more solid foundation for further work." (Bernard, 1995, p733)

The term "fundamental analysis" once again prevails in capital market research following Feltham and Ohlson's study, and the relationship between financial statement data (fundamentals) and firm value is again being emphasised. A number of studies compare the RIV model with traditional models and empirically study the applicability of the RIV model to the stock market.

2.1 Comparison between the RIV Model and Other Models

Bernard (1995), using a four-year forecast period, confirms that the theoretical firm value calculated by using the Feltham-Ohlson model succeeds in explaining 0.68–0.8 of a company's share price, while the traditional DCF model can only explain 0.29 of the price.

Penman and Sougiannis (1998) use US financial data to compare firm value calculated for the three models with actual stock prices. They find that the RIV model, based on accounting information, is more accurate than other models, in that the RIV model has an error rate close to zero over a shorter period (6–8 years). They attribute this to the fact that the RIV model, which is based on accruals, considers the impact of future events on stock earnings; thus, the model can better explain and predict stock prices.

Francis *et al.* (2000) reach similar conclusions to those of Penman and Sougiannis (1998). They find that the predictive power of the RIV model on share price is far superior to the FCF and DDM models. The predictive error of the RIV, FCF, and DDM models are 30 per cent, 41 per cent, and 69 per cent, respectively. For share price interpretation, the RIV, DDM, and FCF models explain 71 per cent, 51 per cent, and 35 per cent of share prices, respectively. Frankel and Lee (1998a) also find that the estimated value of the intrinsic value of stocks calculated by the RIV model is highly relevant to current prices and succeeds in interpreting over 70 per cent of share price changes.

All these findings demonstrate that the RIV model is far superior to the traditional FCF and DDM models in terms of both interpretation of current prices and predictive power for future stock prices.

2.2 The Predictive Power of the RIV Model for Future Stock Returns

Frankel and Lee (1998a) use the *V/P* ratio (where V is the firm value based on the RIV model), *B/P* ratio, and firm size to construct a portfolio to examine the predictive power of the RIV model for future cross-sectional stock returns. They find that firm value, as calculated by the Edwards-Bell-Ohlson model (Bernard, 1994)[4] and derived from the residual income method, can better predict future stock returns. Compared with firm size and *B/P* ratios, the *V/P* ratio has a higher explanatory power for stock prices and future stock returns. After comparing the predictability of *V/P* and *B/P* for future stock returns, they also find that with extended forecasting horizons, the predictive power of *V/P* for stock returns is significantly higher than that of *B/P*. In addition, Frankel and Lee (1998b) also use the RIV model in an international context and find that V has a high explanatory power for share prices in 21 countries; thus, the RIV model has wide international application.

---

[4] The term "Edwards-Bell-Ohlson", or "EBO", was coined by Bernard (1994). Recent applications of this formula are most often associated with the theoretical work of Ohlson (1990, 1991, 1995) and Feltham and Ohlson (1995, 1996, 1997). Earlier theoretical treatments can be found in Preinreich (1938), Edwards and Bell (1961), and Peasnell (1982).

The predictive power of the *V/P* ratio for stock returns is confirmed by other related studies. For example, Herzberg (1998) shows that the results of the model are further improved, or the forecasting ability of *V/P* is better, if a more sophisticated estimating process is used. Dechow *et al.* (1999) employ the RIV model by using different time-series models to forecast future stock returns. They find that the RIV model, which considers information dynamics, better predicts the cross-sectional variations of stock returns.

Lee *et al.* (1999) examine ways to assess the firm value calculated by the RIV model when the stock price itself is a noisy measure of intrinsic value. Their study shows that under general conditions, value estimation not only explains the current stock price, but also has better predictability for future stock returns. After estimating the value of the Dow Jones Industrial Average by using the RIV model, they find that the *V/P* ratio has a higher predictability for future stock returns. They offer a possible explanation as follows: "When intrinsic values are difficult to measure and/or when trading costs are significant, the process by which price adjusts to intrinsic value requires time, and price will not always perfectly reflect intrinsic value."

Ali *et al.* (2003) and Frankel and Lee (1998a) use the same data sources to study the determinants of the forecasting ability of the RIV model. They find that the RIV model is able to predict future stock returns largely because of market pricing errors, which lead to either an overestimation or underestimation of stock prices, thus enabling investors to make a profit.

Different data, such as cross-sectional data (Frankel and Lee, 1998a,b; Herzberg, 1998; Ali *et al.*, 2003) and time series data, are used in the above studies to examine the forecasting ability of the RIV model for stock returns, thus providing sufficient evidence to support its application in capital markets. These studies, however, are all conducted on the securities markets of developed countries. Emerging capital markets have many characteristics that differ from mature capital markets; for example, the former lack a sound legal and management system and have low-quality accounting information and immature market players. Thus, we must seriously consider whether the RIV model is applicable to emerging capital markets.

2.3 Relevant Studies in China

Lu (1999), adopting Collins *et al.*'s (1997)[5] model, which is based on the RIV model in Ohlson (1995), and using the method theoretically studied by Theil in 1997 and applied by Easton in 1985, examines the explanatory power of net assets and accounting income for stock prices. He finds that the joint explanatory power of net assets and accounting income rises during the sample period, and that accounting income is the main explanation for stock prices. The study shows that although the Chinese capital market is immature, investors are still able to accurately judge open accounting information.

---

[5] Collins, D. W., E. L Maydew, and Ira S. Weiss, 1997, Changes in the value-relevance of earnings and book values over the past forty years, *Journal of Accounting and Economics* 24, 39–67.

Song (2000) elaborates the meanings of P/E and P/B by using the Edwards-Bell-Ohlson model, and he examines the predictability of P/E and P/B for future *ROE* by applying Chinese stock market data and using the ex post actual data as the market expectation. The results show that the inherent P/B and P/E estimated by the RIV model can predict future *ROE*. Thus, the Chinese stock market is able to use accounting data effectively and make rational analyses.

Chen *et al.* (2002) examine the annual value relevance of accounting information between 1995 and 1997 in the Shanghai stock market using Ohlson's (1995) RIV model. They find that earnings, net assets, and residual income are positively associated with stock prices, consistent with the prediction of Ohlson's model. Also, when residual income, firm size, and proportion of publicly traded common shares to total equity shares are simultaneously taken into account, value relevance improves. This shows that in the Chinese stock market, the proportion of publicly traded common shares to total equity shares is an important variable in stock prices.

Although Lu (1999), Song (2000), and Chen *et al.* (2002) show the possibilities of applying the RIV model to the Chinese stock market, they do not calculate a stock's intrinsic value directly using the RIV model, nor do they study the relationship between the model and stock returns. Moreover, in using the RIV model, they do not consider the basic assumption of the model, that is, the clean surplus relation (CSR).

Wang *et al.* (2004), Sun and Li (2001), Zhao (1998), Chen *et al.* (1999), and Sun and Chen (2002) further study the value relevance of accounting information and financial indicators in the Chinese stock market. The results indicate that although the maturity of the Chinese stock market cannot be compared to that of developed countries, accounting earnings, net book assets, and residual income have stronger explanatory power for stock prices as well as great value relevance. These studies show that accounting information is highly useful for making investment decisions in the Chinese stock market, hence enabling investors to make more rational decisions using accounting information. This indirectly indicates that the RIV model based on accounting information is applicable to the Chinese stock market.

III. RESEARCH DESIGN

3.1 Residual Income Valuation Model

The residual income valuation (RIV) model used in this study is a discounted residual income approach proposed by Ohlson (1995) and Feltham and Ohlson (1995, 1996). As long as a firm's earnings and book value are forecasted in a manner consistent with clean surplus accounting, the traditional DDM model can be rewritten as the reported book value plus an infinite sum of discounted residual income items:

$$\begin{aligned} V_t &= B_t + \sum_{i=1}^{\infty} \frac{E_t[NI_{t+i} - (r_e B_{t+i-1})]}{(1+r_e)^i} \\ &= B_t + \sum_{i=1}^{\infty} \frac{E_t[(ROE_{t+i} - r_e)B_{t+i-1}]}{(1+r_e)^i} \end{aligned} \tag{1}$$

where V_t = the stock's fundamental value at time t;
B_t = the equity book value at time t;
$E_t[.]$ = expectation based on information available at time t;
NI_{t+i} = net income for period $t + I$;
r_e = cost of equity capital;
ROE_{t+i} = the after-tax return on book equity for period $t + i$.

Equation (1) expresses the firm value in terms of an infinite series, but for practical purposes, the explicit forecast periods must be finite. This limitation necessitates a terminal value (TV) estimate, that is, an estimate of the firm value based on the residual income earned after the explicit forecasting period. According to average return theory and relevant economic theories, when the market reaches a competitive equilibrium, the profit of an enterprise will remain stable over a longer period. Therefore, after an explicit forecasting period, we can calculate the present value of the residual earnings produced by enterprises after time T using perpetuity.

With some mathematical inference and relevant financial theory, the following equation can be used to calculate the terminal value TV_T at period T:

$$TV_T = \frac{(ROE_{T+1} - r_e)}{(1+r_e)^T r_e} B_T$$

In theory, T should be set large enough for firms to reach their competitive equilibrium. But after increasing the length of the period to 12 years to test the predictive ability for stock returns, both Frankel and Lee (1998a) and Lee *et al.* (1999) find that, based on a three-year period, there is almost no impact on predictive ability. With the short history of the Chinese stock market and the lack of an authoritative database for future earnings prediction in China, this paper uses both year-end financial data and actual data from the subsequent three years as the model sample to calculate the intrinsic value[6] by the RIV model, instead of using the predictive value; thus, equation (1) can be rewritten as:

$$\hat{V}_t = B_t + \frac{(FROE_{t+1} - r_e)}{(1+r_e)} B_t + \frac{(FROE_{t+2} - r_e)}{(1+r_e)^2} B_{t+1} + \frac{(FROE_{t+3} - r_e)}{(1+r_e)^2 r_e} B_{t+2} \qquad (2)$$

where B_t = the book value per share from a recent financial statement;
r_e = the cost of equity capital (to be discussed in section 3.1.3);
$FROE_{t+i}$ = forecasted ROE for period $t + i$[7];
B_{t+i} = the book value per share for year $t + i$.

[6] Because of the limitations of the database, this paper uses the actual data instead of the predictive value. A reasonable forecast framework can be inferred based on the conditions and characteristics of the Chinese stock market to enable the practical application of the model.

[7] Theoretically, NI_{t+i}/B_{t+i-1} should be used to calculate the $FROE$. However, to avoid an anomalous value, the formula $FROE = NI_{t+i}/[B_{t+i} + B_{t+i-1}]/2$ is used in this paper.

This paper, in line with the research methods of Frankel and Lee (1998a), Lee *et al.* (1999), and Ali *et al.* (2003), and taking into consideration accessibility to the relevant data and the actual characteristics of the Chinese stock market, lays down the calculation method of the model as follows:

3.1.1 Comprehensive Income

Noting that the key assumption of the RIV model is the CSR,[8] which is sometimes referred to as the net surplus relation, its mathematical algebra is as follows:

$$B_{t+1} = B_t + NI_{t+1} - D_{t+1}$$

That is, the change in book value from period to period is equal to earnings minus net dividends.[9] Fairfield (1994) interprets the clean surplus accounting system as meaning that the dividends in the DDM model can be substituted by the book value of earnings. Ohlson (1995) notes that with the CSR, the book value of equity is reduced by the dividend payments, but there is no impact on the current profitability of assets. After applying this relationship to the DDM model, he concludes that the firm value equals the reported book value plus the present value of future discounted residual income; he further determines that "dividend policy irrelevant" of the MM theory can be derived from this relation, thus solving the literal contradiction that "firm value is determined by future dividend" and "future dividend policy will not affect firm value".

Feltham and Ohlson use the CSR to replace the "efficient market hypothesis" (EMH) required by the previous study as a necessary condition for analysis, without considering the rate of dividends, accounting policies, choice of methodology, and earnings management as long as the accounting treatment of the forecasting period (can be dummy) satisfies the CSR. Consequently, it is quite suitable for the analysis of a firm's intrinsic value. Therefore, the CSR provides a fundamental model for directly estimating a firm's market value on the basis of accounting information (balance sheet and income statement), and provides a consistent framework from a measurement perspective.

The CSR is not formulated to re-establish a new accounting system; rather, its main purpose is to enhance the accuracy of the valuation of a firm's intrinsic value and reduce earnings management without omitting any information that can be used in valuation. By separating a firm's activities into value distribution and value creation activities, the clean surplus relation attributes the firm's value to value

[8] The RIV model is derived from the DDM model, and CSR is a key condition in the inferring process. That is to say, if the CSR is not satisfied, the RIV model cannot be derived from the DDM model (see Ohlson, 1995). Therefore, the CSR is absolutely necessary in the inferring process. In theory, the CSR is a critical condition; please see below for further explanation.

[9] In developing the clean surplus relation, Feltham and Ohlson point out that the exact expression of "d" in a clean surplus relationship should be "dividends net of capital contributions". For simplicity's sake, it is referred to as "dividends". Therefore, "d" in the clean surplus relationship not only represents "dividends" but also equals owners' investments minus distributions to owners.

creation activities rather than value distribution activities. Therefore, after subtracting the segment arising from distribution activities, the change in the firm's net assets should be fully derived from value creation activities. From the above, we can see that the clean surplus relation is a critical condition in the RIV model.

In Frankel and Lee (1998a) and Lee *et al.* (1999), the CSR is expressed in the calculation of the book value, that is, they make use of the clean surplus relation to calculate the next period book value by using the current book value, the forecast of next period earnings, and the forecast of dividends, which requires a more authoritative database for the earnings forecast and a relatively stable dividend payout ratio. But because these two conditions do not currently prevail in China, alternative ways must be considered to satisfy the clean surplus assumption.

From the definition of the clean surplus relation, the essence of the relation is that all gains and losses must be reflected in the income statement, that is, the book value of equity is changed only by the earnings or transactions or events between the enterprise and the owners. According to the theory of comprehensive income, such income is fully consistent with the clean surplus accounting assumptions. As proposed by the FASB, "comprehensive income is the change in equity (net assets) of an entity during a period from transactions and other events and circumstances from non-owner sources. It includes all changes in equity during a period except for those resulting from investments by owners and distributions to owners" (SFAC3, Para 56). This definition shows that the changes in equity over a certain period is divided into three parts: comprehensive income, changes in equity resulting from investments by owners, and changes in equity resulting from distributions to owners. Thus,

The changes of equity in a certain period = current comprehensive income + current investments by owners – current distributions to owners.

The above definition of comprehensive income is identical in essentials and consistent with the clean surplus relation; the net income in the clean surplus relationship actually means comprehensive income. Therefore, this study employs comprehensive income to satisfy the clean surplus relation in the RIV model.[10]

Comprehensive income comes from a broad range of different items with the exception of net income; it also includes other items that cannot be added to net

---

[10] Comprehensive income theory has developed from the "all-inclusive development concept", the concept of "comprehensive income" first proposed by the FASB, which has been widely used by accounting standards in many countries of the world (including the IAS) and has become a focus of earnings theory. Chinese enterprises are still required to apply net income to report business performance, but because of the greater integration and fairness of comprehensive income, in the newly revised 2005 "Enterprise Accounting Principles — Financial Statements Reported (Draft)" for China, enterprises are required to separately report "current earnings, profits and losses directly added into equity, and the changes arising from capital transactions with owners" in equity statements (see page 7 of the draft); this in fact is a listing of comprehensive income. Therefore, from both a theoretical and practical point of view, comprehensive income theory also applies to China. Thus, the concept of comprehensive income is essentially identical to and is consistent with the clean surplus relation in the Chinese stock market.

income, known as other comprehensive income or as "dirty surplus", which mainly includes some gains and losses that have been identified and unrealised.[11] Dirty surplus currently includes some very complex items in Chinese enterprises; if we were to calculate these items specifically and as well as the comprehensive income directly through calculating the sum of these items and net income, not only would this involve enormous calculations, but their accuracy would also be affected because of the complexity of diversified transactions and events between Chinese listed companies. In view of this, this study calculates comprehensive income by an indirect method, that is, we derive the following equation to calculate comprehensive income from a simple deformation of the above definition of comprehensive income:

Comprehensive income = current total shareholders' equity – previous total shareholders' equity + current distributions to owners – current investments by owners.

Because: net dividends = current distributions to owners – current investments by owners.

So the above equation can be rewritten as follows:

Comprehensive income = current total shareholders' equity – previous total shareholders' equity + net dividends.

Here, current and previous total shareholders' equity can be obtained from a company's annual report. Net dividends are defined in line with the definition of the clean surplus relation, and, with the actual characteristics of China in mind, they are calculated using the following formula:

Net dividends[12] = cash dividends[13] – increased equity from SEOs and rights issue.[14]

3.1.2 Forecasting *ROE* (*FROE*)

Related studies generally calculate the *FROE* using the existing forecasting databases of financial analysts. However, because the Chinese financial analysis market

---

[11] By US accounting standards, other comprehensive income mainly includes foreign currency translation adjustments (SFAS52), minimum pension liability adjustments (SFAS87), unrealised gains and losses on securities available for sale (SFAS115), and unrealised gains and losses on derivative instruments (SFAS133). Other comprehensive income includes many items, such as foreign currency capital at the margin, previous annual loss adjustments, revaluation of assets value, acceptance of donations of assets, and so forth.

[12] As mentioned above, the net dividends here are represented by "d" in a clean surplus relation, indicating the net value of distributions to owners (dividends) minus investments by owners.

[13] The net dividends in the formula include only cash dividends and not stock dividends, not because dividends are "cash payments", but taking into account the fact that stock dividends do not affect the equity book value of enterprises while cash dividends do.

[14] In the Chinese stock market, share offerings and new share offerings of listed companies are a more universal way to expand equity (which is very different from the US stock market), which in turn changes the equity book value. Taking into account the essential meaning of "d" in a clean surplus relation, share offerings and new share offerings should belong to the re-investment of shareholders into enterprises; therefore, this item is subtracted in the formula.

is not well developed, it is difficult to find a more authoritative database in this field. Thus, taking into account the short history of the Chinese stock market, the time-series model is not used to forecast the *ROE*; instead, this study uses the ex-post *ROE* calculated in accordance with the clean surplus accounting relation to replace the expected future *ROE*.[15]

3.1.3 Cost of Equity Capital (r_e)

The cost of equity capital, r_e, should theoretically be firm-specific, reflecting the premium demanded by equity investors to invest in a firm or project of comparable risk. Abarbanell and Bernard (1995) and Frankel and Lee (1998a) have found in their studies that the choice of the cost of equity capital has little impact on the results of the analysis. We draw the same conclusions after examining the Chinese stock market using different costs of equity capital.[16] In view of this, we calculate the costs of equity capital in accordance with the method of Lee *et al.* (1999) by computing the sum of the risk-free rate in the current year and a consistent risk premium. The current-year risk-free rate uses the regular three-month currency deposit rates of the current year;[17] based on the conclusions of Zhu and Zheng (2003) on the Chinese stock market risk premium, the risk premium used is 2.03 per cent.[18]

3.2 Regression Models

This study uses the following regression model to test the forecasting ability of the RIV model for future multi-period stock returns:

---

[15] The specific formula is as follows: $FROE_{t+i} = CI_{t+i} / B_{t+i-1}$; where CI_{t+i} is the comprehensive income for year t + i ; B_{t+i-1} is the book value per share for year t+i−1.

[16] We also use three approaches to calculate the cost of equity capital: (1) the cost of capital given by the CAPM and different risk premiums each year; (2) the risk-free rate for the relevant calendar year plus an equity risk premium for all firms in all years (all companies being the same); and (3) use of an 8 per cent rate for all firms in all years.

[17] Three-month bank deposit rates are from the website of the People's Bank of China: http://www.pbc.gov.cn

[18] To test the impact of the risk premium on the research findings, we also use three methods to determine the risk premium: (1) we directly use the conclusions of Zhu and Zheng (2003) on the Chinese stock market risk premium (2.03%); (2) considering the cyclical fluctuations in the Chinese stock market, we identify the period from January 1995 to December 2004 as a cycle, according to the data of the A-shares' monthly stock returns in this period, using a geometric average approach to calculate the average equity risk premium used in the study; and (3) in view of the great changes between the early and later periods of the Chinese stock market, according to Damodaran (2000), we identify the following formula to calculate the annual different risk premium: The annual average risk premium from 1995 to 2004 = the standard deviation of the monthly stock market rate of return of the current year / the standard deviation of the monthly stock market rate of return from 1995–2004. After using the three methods of calculating risk premiums to examine the assumptions of this paper, we find that the choice of risk premium has almost no impact on the conclusions of the analysis; further taking into account the outdated risk premium study, we ultimately use the conclusions of Zhu and Zheng (2003) on the risk premium of the Chinese stock market (2.03%) as the risk premium to calculate the cost of capital.

$$r(t,t+k) = X_t\theta + e_{t+k}, \tag{3}$$

Where $r(t, t+k)$ = the stock returns from period t to period $t+k$ (generally using monthly stock returns);

k = the forecasting horizon;

X_t = a 1× m row vector of the explanatory variables (including the intercept);

θ = a m × 1 vector of slope coefficients;

$e_{t+k,t}$ = the regression residual.

The model, constructed by Fama and French (1988a,b; 1989),[19] can be used to test the predictability for future multi-period stock returns. In this regression, the stock returns over the next K periods is regressed on one or more explanatory variables from the current period; thus, it is a multi-period forecasting regression. This study uses k = 1, 3, 6, 12, 18, 24, and 36 months for the OLS regression analysis. First, we regress the next 1-36 months' stock returns on the *V/P* ratio for the single-factor regression analysis, and then gradually add the related control to the multi-factor regression analysis.[20]

Campbell (1993) shows that using overlapping observations may lead to autocorrelation and heteroskedasticity in the regression residuals. Therefore, we correct for both induced autocorrelation and heteroskedasticity by using a Newey-West correction (see Newey and West, 1987) for all "t" statistics.[21]

3.3 Hypotheses and Research Models

3.3.1 Correlation with Current Stock Prices

The true intrinsic value of a stock cannot be directly observed based on traditional financial theory. Therefore, whether from an academic or a practical perspective, we need to find a better variable that reflects a stock's intrinsic value and can be easily observed. Many financial economists believe that the stock price P is such a variable. A good estimator of stock value should be able to explain stock prices well. Bernard (1995), Penman and Sougiannis (1998), and Frankel and Lee (1998a,b) also show that compared with the book value, the intrinsic value

---

[19] Fama and French employ this model in their study for testing the results of the time-series data. The paper uses the stock variables in the future multi-period to test the results of the cross-sectional data.

[20] The study by Penman and Sougiannis (1998) shows that when the forecasting period is about 5-8 years, the accuracy of the model is greatly enhanced. But since the related data are insufficient due to the short history of the Chinese stock market, this paper uses data from only three years to test the predictability of the model for future stock returns in China. The overall accuracy of the forecast will be lower than that of a forecasting period of 5-8 years. The forecasting period can be extended for further study to observe the predictability of future stock returns over a longer period.

[21] Newey and West (1987) show that when an unknown autocorrelation and heteroskedasticity exist, the heteroskedasticity autocorrelation consistent covariance calculated by the Newey-West method can ensure the consistency and effectiveness of the estimator. Lee *et al.* (1999), Frankel and Lee (1998a), and Ali *et al.* (2003) have all used this method to correct the autocorrelation and heteroskedasticity induced by overlapping observations and other problems.

calculated with the RIV model has a higher relevancy with the current stock price. The first hypothesis is:

H1: Compared with the book value, the firm's equity value calculated using the RIV model can better explain the current stock price.

To test H1, this paper uses the Spearman correlation coefficient and further examines the predictability of the RIV model for future stock returns based on an analysis of the relevance between a stock's intrinsic value and the current stock price.

3.3.2 Correlation with Future Returns

Stock prices not only reflect a stock's intrinsic value but are themselves affected by many other factors in the stock markets. As mentioned by Lee *et al.* (1999), the stock price is a noisy measure of its own intrinsic value. But over a longer period, the stock price and its intrinsic value will converge. Either the observable price or the estimator of value (that is, the stock value calculated using various models) usually converge in true (but unobservable) intrinsic value.[22] As such, the stock price fluctuates around its intrinsic value. The more distant the extent of deviation of current stock prices from the intrinsic value, the greater the possibility of a change in stock price in the future. So we can predict future stock returns by observing the degree of deviation of the current stock prices from the stock's intrinsic value. Therefore, a good estimator of the stock value not only explains the current stock price returns, but also has better predictability for future stock returns.

According to the above theory of value investment, the stock price fluctuates around its intrinsic value. In the long run, stock prices tend to revert to their intrinsic value. Therefore, when the stock price differs from its intrinsic value, we can use the *V/P* (V is the stock's intrinsic value, and P is the stock price) ratio to predict future stock returns. From this perspective, and in view of the related studies of Frankel and Lee (1998a) and Lee *et al.* (1999), this paper treats the *V/P* ratio as the major variable in examining the predictability of the RIV model for future stock returns. If the RIV model does apply well to the stock market in China, then the *V/P* ratio calculated by using the RIV model should be positively correlated with future stock returns — that is, the higher the *V/P* ratios, the higher the future stock returns, and vice versa. But the process of reverting the stock prices to their intrinsic value takes a longer time; Frankel and Lee (1998a) and Lee *et al.* (1999) also find that by extending the forecasting horizon, the predictive power of the *V/P* ratio clearly grows stronger. Hence, the above analyses lead us to the second hypothesis:

---

[22] Because a stock's intrinsic value is decided by a company's inherent features, such as assets, profits, dividends, corporate development, manager characteristics, and so forth, the intrinsic value is not static, that is, it changes with the changes in different factors. But just like the change in the market value, the change in the intrinsic value is not quick or intensive; thus, investors can still make a profit by making use of this time lag.

H2: the *V/P* ratio can predict future stock returns; the longer the forecasting horizon, the better the effect of the prediction.

The following model is used to test H2:

$$r(t,t+k)=\beta_0+\beta_1 V/P+e_{t+k} \tag{4}$$

Where $r(t, t+k)$ is the stock return from month t to month $t+k$. We use the buy and hold return (BHR)[23] employed by Frankel and Lee (1998a) and Ali *et al.* (2003) to calculate the stock returns, and the formula is constructed as follows:

$$BHR_t=\prod_{t=0}^{T}(R_{it}+1)-\prod_{t=0}^{T}(R_{mt}+1)$$

Where R_{it} is the stock return of firm i over period t; R_{mt} is the stock market return over period t. This paper adopts Ret1, Ret3, Ret6, Ret12, Ret18, Ret24, and Ret36 to express stock returns when $k=1$, 3, 6, 12, 18, 24, and 36 months, respectively.

In this study, the choice of stock price P is an important issue. The China Securities Regulatory Commission (*CSRC*) requires all listed companies to release their financial reports in the first four months after the end of the fiscal year. But taking into account the lag in market response behind the annual report information and the belief of related studies that stock prices at the end of June fully reflect the information contained in the annual report (see Fama and French, 1992; Frankel and Lee, 1998), this study therefore uses a stock's closing price on the last trading day of the June following the end of the fiscal year to match the stock price with the annual report information. With this in mind, the stock return in this study is calculated from the beginning of the July following a fiscal year, that is, Ret1-Ret36 represent the respective stock returns of the next month, starting from the next July, through the following 36 months.

As mentioned above, *V/P* is an intrinsic value to price ratio, which is calculated as follows: the stock intrinsic value V is calculated based on the RIV model and then divided by the stock's closing price P in the last trading day of the June following the end of the fiscal year. Its predictive power for future stock returns is then tested starting from the next month of July for the following 36 months.

Taking into account the separation of the Chinese stock market[24] into different

---

[23] There are many approaches to stock return calculations. The stock return used in Fama and French (1988a,b, 1989) is a continuous compounded return. This paper follows the BHR method used in Frankel and Lee (1998a) and Ali *et al.* (2003) to test the predictive power of the RIV model for future cross-sectional stock returns. To avoid the stock return calculation approach affecting the conclusion, we use a continuous compounded return as a substitute of BHR for the dependent variable in the robustness test below.

[24] Since the sample firms are from different years, to test the impact of the *V/P* ratio on future stock returns in different years, we also add two different types of dummy variables in model (5): annual dummy variables and *V/P**year t. Results show that when adding the annual dummy variables, the conclusion is almost unaffected, though the values of the annual dummy variables are all significant. When the value of K is different, the slope

stages, the paper adds the dummy variables "stage" to control for the changes in various stages, with the regression model established as follows:

$$r(t,t+K) = \beta_0 + \beta_1 V/P + \sum_{i=1}^{4} \alpha_1 Stage(i) + e_{t+K,t} \quad (5)$$

Stage(*i*), representing the dummy variables at stage t, consists of Stage (1), Stage (2), Stage (3), and Stage (4). The stages are divided based largely on the policy intervention characteristics and system changes in the development of the Chinese stock market, as well as the approach applied by Lu and Xu (2004). According to the fluctuations in stock prices on the Shanghai and Shenzhen Stock Exchanges (SHSE and SZSE), this paper divides the sample period into five stages:[25] if a firm belongs to a certain stage sample, the stage dummy variable is 1, and 0 otherwise.

3.3.3 Effects of Other Factors Relevant to Stock Returns

In addition to the impact of intrinsic value, many other factors also affect stock returns. The capital asset pricing model (CAPM) holds that a stock's return is the compensatory return on the risk factors, with higher returns accompanied by higher risks. But in recent years a large number of empirical studies have shown that in addition to market risk factors, cross-sectional stock returns are also associated with a firm's characteristics. Fama and French (1992, 1993, 1996) advance three factor models to explain stock returns in their classic literature, with firm size and book value as two additional risk factors. They find that average stock returns are higher when both values are lower, this is valid even after adjustment of the *Beta*. So the authors believe that firm size and book-market value can predict the cross-sectional differences of stock returns. But Frankel and Lee (1998a) find that after controlling for both factors, the *V/P* ratio continues to have better predictive power for future stock returns.

In addition, Chen *et al.*, (2001), Lu *et al.*, (2001), Jia and Chen (2003), Zhou (2004), Su and Chen (2004), Xu and Wu (2004), and Su and Mai (2004) all indicate that in addition to firm size and *B/P* ratio, stock returns in the Chinese stock markets are also subject to the proportion of publicly traded common shares to total equity shares, the *P/E* ratio, cash dividends per share to price, earnings per share, and so on. If the residual income model can forecast stock returns as mentioned above, although these factors have some effect, the forecasting power of the model for

---

coefficients of the *V/P* ratio also remain significant, though their slope coefficients in different years show some differences. Taking this point into account, we implement the annual regression in the following robustness test to ensure the stability of the conclusions.

[25] The five stages cover the following periods: September 1994 to January 1996, January 1996 to May 1997, May 1997 to May 1999, May 1999 to June 2001, and June 2001 to January 2002. In the process of the stage division, we analyse the SHSE and SZSE respectively. For the SHSE, we choose the daily closing index of the SHSE's comprehensive index, while for SZSE, the choice is the daily closing index of SZSE's component index. We find after careful comparison that the stock price fluctuations in the SHSE and the SZSE are basically the same. Consequently, in the division stage we do not distinguish between the two exchanges.

stock returns should not be the result of them. We find that after controlling for the relevant factors, the model still has strong predictability for future stock returns.[26] So this paper makes the further hypothesis:

H3: The significant predictive power of the RIV model for stock returns is not induced by the effect of other related factors.

The following model is used to test H3:

$$\begin{aligned} r(t,t+K) = {} & \beta_0 + \beta_1 V/P + \beta_2 LnME + \beta_3 B/P + \beta_4 OUTSHARE + \beta_5 EPS \\ & + \beta_6 EPSdummy + \beta_7 E/P + \beta_8 D/P + \beta_9 D/Pdummy \\ & + \sum_{i=1}^{4} \alpha_i Stage(i) + e_{t+K,t} \end{aligned} \quad (6)$$

Where *LnME* is a variable used to represent the firm size. It is the natural logarithm of *ME*. Here *ME* is the market value of publicly traded common shares at the end of the following June; it is the product of the circulation of publicly traded common shares and the stock closing price at the end of June.

B/P is the book value per share to price calculated using the net assets per share at the end of the current year, divided by the stock's closing price on the last trading day of the June following the end of each fiscal year; the net assets per share can be obtained from a firm's annual report.

OUTSHARE is the proportion of publicly traded common shares to total equity shares at the end of the following June.

EPS is earnings per share calculated using the net profit after tax divided by the total equity shares; since the net profit after tax may be zero or negative, we need to add a dummy variable (*EPS* dummy); this equals 1 if *EPS* is less than or equal to zero, and 0 otherwise.

E/P is earnings to price, calculated using earnings per share divided by the stock's closing price on the last trading day of the June following the end of each fiscal year.

D/P is cash dividends per share to price calculated using cash dividends per share (D) divided by the stock's closing price on the last trading day of the June following the end of each fiscal year.

D/P dummy is a dummy variable that equals 1 if cash dividends are zero, and 0 otherwise.

---

[26] In addition to the controlling variables mentioned here, Ohlson and Feltham (1995) and Penman (2001) show that the composition of the accounting earnings (permanent and temporary earnings) and the choice of accounting policies have a certain impact on the application of the RIV model. This paper does not take into account these factors, which can be added in future research to further examine the predictive power of the RIV model for future stock returns after controlling for them.

3.3.4 Effects of Risk Factors

Beaver (2002), Kothari (2001), and Lo and Lys (2000) believe that the forecasting ability of the *V/P* ratio for future stock returns may be due to the existence of some neglected risk factors in the model, whereas Frankel and Lee (1998a), using the firm size and book value as a proxy for risk factors, find that the *V/P* ratio continues to better predict future stock returns after controlling for the effect of both variables. Ali *et al.* (2003) further examine whether the predictive power of *V/P* is due to market mispricing or omitted risk factors. They find that the effect of *V/P* does not appear attributable to the risk factors involved but rather to stock mispricing. As a result of mispricing, the stock price is either undervalued or overrated, and investors have a chance to earn investment income. After controlling for the influence of the related risk factors, the *V/P* ratio still has a higher forecasting power for stock returns. This leads to the following hypotheses:

H4.1: The *V/P* ratio has a certain correlation with certain risk factors;
H4.2: The predictive power of the *V/P* ratio for stock returns is not due to the correlation of *V/P* with certain risk factors.

Models (7) and (8) are used to test H4.1 and H4.2, respectively:

$$V/P = a_0 + a_1 Beta + a_2 LnME + a_3 B/P + a_4 D/M + a_5 Zvalue + a_6 StdROE + a_7 AverCC + a_8 DTL + e \quad (7)$$

$$r(t,t+K) = \beta_0 + \beta_1 V/P + \beta_2 Beta + \beta_3 LnME + \beta_4 B/P + \beta_5 D/M + \beta_6 StdROE + \beta_7 AverCC + \sum_{i=1}^{4} \alpha_i Stage(i) + e_{t+K,t} \quad (8)$$

Where *Beta* is the firm's beta coefficient, reflecting the firm's market risks, computed directly using the daily stock returns from January 1 to June 30 of each year according to the definition of *Beta*.

D/M is the firm's debt to equity, reflecting the firm's financial leverage risk.

Z-value is the firm's Z value; we calculate this value according to Altman (1968) to reflect the firm's financial bankruptcy risks.

StdROE is the standard derivation of return-on-equity, computed using the daily stock returns from January 1 to June 30 of each year.

AverCC is the average cost of capital in the industry the firm belongs to, reflecting the industry risks; these are the risks most likely to be overlooked and not captured by the firm's characteristics. It is computed using the average industry return on assets (*ROA*) each year. The standard of industrial classification comes from the guidelines for this issued by the CSRC for listed companies. After eliminating the finance and insurance industries, it is divided into 12 major industries to calculate the industry-average cost of capital.

In addition, according to Fama and French (1992, 1993, 1996), the firm size (*ME*) and the book value to price (*B/P*) can be proxied for risk factors reflecting firm-specific risks.

3.4 Sample Selection and Data Sources

The sample period in this study ranges from 1994 to 2004.[27] Since the sample testing period in this study is 1–36 months, the stock return in this study is calculated from the beginning of the following July. This means that to test the correlation of *V/P* with the stock returns of the following 36 months, sample firms must have stock trading data for at least three years from the beginning of the following July. So the sample firms in this study include only those firms in existence at the end of 2000 to obtain the relevant data for the following three years.

Based on the above analyses, the sample firms in this paper consist of the A-share listed companies listed on the SZSE and the SHSE from years 1994 to 2000. Sample firms are selected to meet the following conditions:

(1) Since ST and PT companies are seriously affected by non-performance factors and are easily manipulated by the banker, this paper eliminates ST and PT companies in $[t,t+3]$ years from the sample firms in year t;

(2) Since the financial industry is very different from other industries and this study needs to use data from four consecutive years to compute a stock's intrinsic value using the *RIV* model, the selected sample firms are non-financial-industry listed companies and have financial reporting data and transaction information for a minimum of four consecutive years;

(3) Since a firm's *ROE* cannot be calculated for negative net assets, the firm's book value of net assets should be positive. In addition, some firms have extremely low book values, leading to an unreasonable *ROE*. Moreover, since one of the assumptions for using the RIV model to calculate stock values is that "[t]he market that the firm belongs to will be in competitive equilibrium in the third year", in a state of competitive equilibrium a company's sustained *ROE* at less than 0 or greater than 100 per cent is unreasonable. Therefore, the sample firms' *ROE* in the third year should be between 0 and 100 per cent; and

(4) Taking into account the data's stability and reasonability, firms whose stock price is too low on the last trading day of the June following the end of the fiscal year should not be included in the sample firms.

All data in this study are derived from the Chinese stock market research (CSMAR) database (2004 edition). The software used for data analysis is SPSS 13.0 and EViews 5.0[28].

3.5 Sample Descriptive Statistics

This paper obtains a sample of 3,195 firm-years according to the sample selection criteria required by the research design: (1) 245 firms from year 1994; (2) 226 firms

---

[27] The reason for using data after 1994 is partly because prior to that year, the number of listed companies is too small for a large-scale sample empirical study. Also, a great number of standards in relation to accounting treatment and information disclosure of listed companies were promulgated in 1993 and 1994; thus, the subsequent years' annual reports announced by companies have basic normative, strengthening horizontal data comparability and are more conducive to normative research.

[28] SPSS 13.0 is used for descriptive statistics and correlation coefficient calculations, regression analysis, and EViews 5.0 is used for other related work.

from year 1995; (3) 312 firms from year 1996; (4) 563 firms from year 1997; (5) 468 firms from year 1998; (6) 642 firms from year 1999; and (7) 739 firms from year 2000.

Table 1 reports the descriptive statistics on some related variables in the study, including stock returns, *V/P* ratio, controlling variables in the regression models, and variables related to the risk factors.

Table 1 Descriptive Statistics for the Variables

	N	Minimum	Maximum	Median	Mean	Std. deviation
*Ret*1	3,195	−0.334376	1.052073	−0.005909	0.009809	0.111703
*Ret*3	3,195	−0.790643	1.594062	−0.004027	0.021194	0.181534
*Ret*6	3,195	−0.898747	3.075233	−0.000371	0.032237	0.236294
*Ret*12	3,195	−1.400075	6.755170	−0.006732	0.071419	0.513578
*Ret*18	3,195	−1.605177	4.572688	−0.002901	0.080990	0.553799
*Ret*24	3,195	−2.450580	16.173608	−0.004767	0.144791	0.946741
*Ret*36	3,195	−2.274638	13.925292	−0.001084	0.214969	1.069924
V/P	3,195	0.000544	9.487650	0.327355	0.449088	0.484090
LnME	3,195	10.704367	16.671560	13.583634	13.514173	0.863043
B/P	3,195	0.005308	3.917607	0.223309	0.458638	0.680525
OUTSHARE	3,195	0.037307	1.000000	0.339580	0.361509	0.133044
EPS	3,195	−2.104664	2.276996	0.273474	0.285464	0.256322
E/P	3,195	−0.420933	0.192883	0.021218	0.022944	0.027714
D/P	3,195	0.000000	0.131291	0.000000	0.007557	0.012771
Beta	3,195	−0.100686	2.060047	1.006845	1.003523	0.242007
D/M	3,195	0.005565	54.833580	0.690380	0.911666	1.341325
Z-value	3,195	−0.627522	929.438400	5.099460	10.557900	33.253100
StdROE	3,195	0.004829	0.085834	0.029042	0.0288523	0.009640
AverCC	3,195	−0.020479	0.275552	0.086081	0.085782	0.040228

IV. EMPIRICAL RESULTS AND ANALYSIS

4.1 Correlation with Stock Prices

Table 2-1 describes the Spearman correlation coefficient of the stock price on both its intrinsic value and book value, where stock price (P) is the stock's closing price on the last trading day of the June following the end of the fiscal year; the stock's intrinsic value (V) is the intrinsic value using the RIV model; and the book value (B) is the net assets per share derived directly from the CSMAR databases.

In the sample period, the Spearman correlation coefficient of the stock price on the book value is 0.321, which indicates that the book value can explain 10.3 per cent (0.3212) of the cross-sectional differences of the stock prices. According to H1, the correlation coefficient of the equity value (V) using the RIV model on the stock prices should be higher than the correlation coefficient of the net book value on stock prices. But we can see from Table 2-1 that, with the exception of 1994, 1997, and 1999, the correlation coefficients of V on stock prices are lower than those of B on the stock prices for other years, and the correlation coefficients of V on stock prices are only slightly higher than those of B on the stock prices in the same year. In addition, the average of the correlation coefficients of V on stock prices is 0.318, indicating that the intrinsic stock value can explain 10.11 per cent of changes in the stock prices, or slightly lower than that of the book value.

Table 2-1 Correlation of Current Stock Prices with Intrinsic Value and Book Value

Year	Observations	B	V
1994	245	0.395***	0.426***
1995	226	0.426***	0.413***
1996	312	0.495***	0.386***
1997	563	0.338***	0.370***
1998	468	0.290***	0.282***
1999	642	0.176***	0.233***
2000	739	0.127***	0.118***
All Years	3195	0.321	0.318

Notes: *** denotes that the test is statistically significant at the 1% level; the values of "All Years" represent the average for all years.

From Table 2-1 we also observe an interesting phenomenon: in the sample period, from 1994 to 2000, the Spearman correlation coefficient of the stock price on the intrinsic value gradually decreases, indicating that the share prices in the Chinese stock markets increasingly deviate from their intrinsic value, while bubbles in the share prices gradually increase[29] over time (until 2000); this also indicates that the Chinese stock market is still immature. The above analysis suggests that H1 is not correct, that is, in the Chinese stock markets, a firm's equity value based on the RIV model cannot explain most of changes in stock price but only provides a limited explanation, while the explanatory power of the intrinsic value for the current stock price is slightly lower than that of the book value. This is inconsistent with the conclusions of related research (Bernard, 1995; Penman and Sougiannis, 1998; Frankel and Lee, 1998a,b), which may be due to the immaturity of the Chinese stock markets, the high deviation of current stock prices from their intrinsic value, and stock prices not reflecting their intrinsic value.

Based on the immaturity of the Chinese stock markets, this paper infers another possibility: it takes longer for those in the Chinese stock markets to absorb the extra

[29] Since 2000, the stock prices on the Chinese stock market have been on a constant decline, indicating that the prices are gradually returning to their intrinsic value as the bubble in stock prices is gradually deflated. Thus it is to be noted that the Chinese stock market is progressing to maturity. Regarding the deviation of stock prices from their intrinsic values and the bubbles in stock prices in the Chinese stock market, please see Zhao (2003), "The analysis for the deviation of stock prices from their intrinsic values", *Economic Research*, No. 10; and Liu (2005), "The investment theory on stock intrinsic value and the bubble problem in Chinese stock market", *Economic Research*, No. 2.

information contained in the intrinsic value as compared to the information in the book value; thus the superiority of intrinsic value in explaining stock prices compared to book value can only be reflected after a certain period of time. Tables 2-2 and 2-3 describe the Spearman correlation coefficients of the stock prices on intrinsic value and book value one year and two years after, respectively:

Table 2-2 Annual Correlation of Stock Prices on Intrinsic Value and Book Value One Year After

Year	Observations	B	V
1994	245	0.414***	0.584***
1995	226	0.396***	0.462***
1996	312	0.261***	0.438***
1997	563	0.125***	0.422***
1998	468	0.040	0.262***
1999	642	0.015	0.207***
2000	739	0.117***	0.231***
All years	3195	0.195	0.372

Notes: *** means that the test is statistically significant at the 1% level; the values of "All Years" represent the average for all years.

Table 2-3 Annual Correlation of Stock Prices on Intrinsic Value and Book Value Two Years After

Year	Observations	B	V
1994	245	0.399***	0.686***
1995	226	0.157***	0.466***
1996	312	0.102	0.454***
1997	563	–0.590	0.417***
1998	468	–0.700	0.194***
1999	642	0.006	0.296***
2000	739	0.115***	0.392***
All years	3195	–0.073	0.415

Notes: *** denote that the test is statistically significant at the 1% level; the values of "All Years" represent the average for all years.

We can see from Tables 2-2 and 2-3 that in all years, the correlation coefficients of V on stock prices are higher than those of B, and the average correlation coefficient of V on stock prices is significantly higher than that of B. This shows that a stock's intrinsic value based on the RIV model better explains stock prices after a certain period than does book value, indicating that the superiority of intrinsic value in explaining stock prices compared to book value can only be reflected after a certain period of time.

Tables 2-2 and 2-3 also show that with the extended time period, the correlation coefficients of V on stock prices gradually increase, that is, the relevance between them is gradually enhanced, indicating that a reversion of book price to intrinsic value takes a longer time. This may be because it takes longer for those in the Chinese stock markets to absorb the extra information contained in the intrinsic value, and because the Chinese stock market is still immature. The former issue exists in all countries, and the latter is a problem in the Chinese stock markets as well as the capital markets in developing countries with similar situations to China's. This leads to a problem: many prior related studies have shown that the Chinese stock markets have reached a "weak effectiveness" in that stock prices fully reflect all information implied in the historical data; stock prices should then contain the stock intrinsic value calculated by using the accounting information (through the residual income model). Even if a certain lag period exists in the stock markets, why then is the relevance of the stock price and the intrinsic value higher in one or two years' time? Does this mean that the reversion of the stock price to the stock's intrinsic value takes longer than the results of the prior related studies suggest? This issue requires further study.

4.2 Correlation with Future Stock Returns

Table 3-1 shows the regression results of model (4). The forecasting horizon $K = 1$, 3, 6, 12, 18, 24, and 36 months.

Table 3-1 Regression Results of Model (4)

K	β	T-value	P-value	Constant	Adj.Rsq	N
1	0.024	3.810	0.000	−0.001	0.011	3195
3	0.037	4.354	0.000	0.004	0.010	3195
6	0.062	4.795	0.000	0.004	0.016	3195
12	0.197	5.554	0.000	−0.017	0.034	3195
18	0.261	6.495	0.000	−0.036	0.052	3195
24	0.612	6.685	0.000	−0.130	0.098	3195
36	0.770	6.272	0.000	−0.131	0.121	3195

Notes: K represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β represent the slope coefficients; T-values represent the value of t-statistics for the slope coefficients (as mentioned above, all values of t-statistics in this table and all following tables use the Newey-West correction); P-values are the actual significance level of the slope coefficients; Constant represents the value of constant in the regressions; Adj.Rsq. represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Table 3-1 shows that the *V/P* ratio has strong predictability for future stock returns. In all forecasting horizons, the actual significance of the T-value of the slope coefficients are smaller than 0.01 per cent, and the adjusted R squares from the regressions range from 1 per cent to 12.1 per cent, indicating that the *V/P* ratio can explain a portion of the future stock returns.[30] The slope coefficients in all forecasting horizons are positive, indicating a high *V/P* ratio representing higher future returns. We

[30] In regressing the cross-sectional data, the adjusted R-square is generally lower; thus, we mainly focus on the slope coefficients and the significance level of the variables.

also note from Table 3-1 that when the forecasting horizon (K ranging from 1 to 36 months) is extended, the slope coefficient β presents an upward trend, indicating that the longer the forecasting horizon, the stronger the predictive power of the *V/P* for future stock returns. We further find that the T-value of the slope coefficient β again shows an upward trend, indicating that the forecasting ability of the *V/P* ratio for stock returns increases with the time extension.

After adding the stage dummy variables to model (4), the regression results of model (5) are as follows:

Table 3-2 Regression Results of Model (5)

	K	1	3	6	12	18	24	36
Constant	β_0	−0.013	−0.034	−0.024	−0.233	−0.334	−0.516	−0.519
	T-value	−1.613	−1.595	−1.687	−5.482	−3.018	−2.524	−3.766
	P-value	0.107	0.111	0.092	0.000	0.003	0.012	0.000
V/P	β_1	0.023	0.039	0.068	0.203	0.271	0.610	0.739
	T-value	4.429	4.815	5.414	5.946	6.644	6.639	6.329
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
*Stage*2	α_1	0.021	−0.005	−0.048	0.010	0.109	0.275	0.526
	T-value	0.573	−0.120	−0.732	0.812	0.809	1.212	2.889
	P-value	0.567	0.905	0.464	0.417	0.419	0.226	0.004
*Stage*3	α_2	0.020	0.068	0.045	0.286	0.388	0.587	0.714
	T-value	2.138	3.061	2.781	6.014	3.412	2.731	4.952
	P-value	0.033	0.002	0.005	0.000	0.001	0.006	0.000
*Stage*4	α_3	0.015	0.044	0.051	0.273	0.368	0.534	0.366
	T-value	1.774	2.026	3.363	6.259	3.280	2.067	2.698
	P-value	0.076	0.043	0.001	0.000	0.001	0.039	0.007
*Stage*5	α_4	0.003	0.019	−0.003	0.145	0.219	0.238	0.182
	T-value	0.334	0.912	−0.186	3.399	1.955	1.125	1.339
	P-value	0.739	0.362	0.852	0.001	0.051	0.261	0.181
	Adj.Rsq	0.014	0.026	0.031	0.064	0.099	0.129	0.165
	N	3195	3195	3195	3195	3195	3195	3195

Notes: *K* represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β_1 represent the slope coefficients; the values of $\alpha(i)$ represent the slope coefficients of the stage dummy variables; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Constant represents the value of constant in the regressions; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Table 3-2 describes the regression results of model (5); it shows that after controlling for the influence of the change in different stages, the slope coefficient of the *V/P* ratio and adjusted R-square of the model display a certain degree of improvement, indicating that in the Chinese stock markets, the policy changes at different stages have a certain impact on future stock returns; apart from this, Table 3-2 shows similar results to those of Table 3-1. Therefore, this paper adds the stage dummy variables to the regression models as controlling variables.[31]

[31] For simplicity's sake, and given that only the stage dummy variables are taken as the controlling variables, the study below does not report the stage dummy variable data.

4.3 Effects of Other Factors Relevant to Stock Returns

After adding other factors relevant to stock returns to the regression model as the controlling variables, the regression results of model (6) are as follows:

Table 4 Regression Results of Model (6)

	K	1	3	6	12	18	24	36
Constant	β_0	0.063	0.340	0.797	1.500	1.828	3.130	4.750
	T-value	1.490	4.363	8.303	6.753	7.015	7.051	9.995
	P-value	0.136	0.000	0.000	0.000	0.000	0.000	0.000
V/P	β_1	0.024	0.038	0.069	0.199	0.247	0.601	0.785
	T-value	4.476	4.742	5.375	5.700	6.257	6.475	6.463
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LnME	β_2	−0.008	−0.038	−0.077	−0.169	−0.224	−0.352	−0.467
	T-value	−2.254	−5.900	−9.830	−9.413	−12.183	−11.809	−12.570
	P-value	0.024	0.000	0.000	0.000	0.000	0.000	0.000
B/P	β_3	0.017	0.002	0.016	0.066	0.063	0.078	0.159
	T-value	3.695	0.321	1.992	4.505	4.329	2.920	4.813
	P-value	0.000	0.748	0.047	0.000	0.000	0.004	0.000
OUTSHARE	β_4	0.010	0.077	0.133	0.268	0.362	0.566	0.898
	T-value	0.534	2.776	3.964	3.435	4.848	3.894	5.419
	P-value	0.594	0.006	0.000	0.001	0.000	0.000	0.000
EPS	β_5	−0.056	−0.116	−0.023	−0.125	−0.209	−0.356	−0.370
	T-value	−3.983	−4.141	−0.771	−1.728	−2.235	−2.709	−3.118
	P-value	0.000	0.000	0.441	0.084	0.026	0.007	0.002
EPSdummy	β_6	0.040	0.095	0.103	0.206	0.408	0.491	0.137
	T-value	2.385	3.223	2.769	2.973	4.114	3.304	0.799
	P-value	0.017	0.001	0.006	0.003	0.000	0.001	0.424
E/P	β_7	0.287	0.781	0.163	2.147	4.596	5.773	1.620
	T-value	1.835	2.422	0.409	3.061	3.663	2.750	1.120
	P-value	0.067	0.016	0.683	0.002	0.000	0.006	0.263
D/P	β_8	0.480	1.771	2.411	4.355	7.914	6.895	3.003
	T-value	1.698	3.473	3.863	3.548	5.223	2.190	1.207
	P-value	0.090	0.001	0.000	0.000	0.000	0.029	0.227
D/Pdummy	β_9	0.008	0.032	0.034	0.065	0.104	0.124	0.086
	T-value	1.571	3.992	3.110	2.786	3.808	2.419	1.955
	P-value	0.116	0.000	0.002	0.005	0.000	0.016	0.051
	Adj.Rsq	0.043	0.091	0.094	0.129	0.215	0.212	0.276
	N	3195	3195	3195	3195	3195	3195	3195

Notes: *K* represents the forecasting horizon, where *K* = 1, 3, 6, 12, 18, 24, and 36 months; the values of β(i) represent the slope coefficients; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Constant represents the value of constant in the regressions; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Table 4 shows the regression results of model (6). The forecasting horizon $K = 1$, 3, 6, 12, 18, 24, and 36 months. The table shows that, after controlling for the impact of other relevant factors, the *V/P* ratio also better predicts the future stock returns. The slope coefficients of *V/P* in all forecasting periods are significant (greater than 0), and the actual significance level of the slope coefficients is far below 0.01 per cent. With the time extension, the slope coefficients of *V/P* significantly increase from 0.024 to 0.785 when the forecasting periods range from 1 to 36 months.

It is notable that the slope coefficients of *E/P* and *D/P* are higher than those of *V/P*, but the values of the t-statistics are far below the *V/P*'s T-value (although their significance levels are less than 1 per cent), indicating that although its slope coefficients are below *E/P* and *D/P*, the significance level of the linear effect of the *V/P* ratio on future stock returns is higher than *E/P* and *D/P*.[32] The longer the forecasting period, the more obvious its advantages become. Therefore, we can draw from Table 4 a similar conclusion to the previous findings: the longer the forecasting horizon, the stronger the predictive power of *V/P*; moreover, the predictability of *V/P* is not due to firm size, book value to price, or other related factors.

4.4 Effects of Risk Factors

Kothari (2001) believes that the reason the *V/P* is able to predict future stock returns may be due to the neglect of certain risk factors in the model. But Frankel and Lee (1998a) and Ali *et al.* (2003) find that the *V/P* ratio remains highly correlated with future stock returns after controlling for these risk factors. Accordingly, this part of the study mainly examines whether the forecasting power of the *V/P* ratio for future stock returns results from the impact of certain risk factors.

4.4.1 Correlation of *V/P* Ratio on Risk Factors

Tables 5-1 and 5-2 respectively report the Pearson correlation coefficients and Spearman correlation coefficients of *V/P* on some risk factors, from which we can make a preliminary analysis of the relationship between the *V/P* ratio and these risk factors.

We can see from Tables 5-1 and 5-2 that the *V/P* ratio has a significant negative relation with *Beta* and *StdROE*, meaning that a higher *V/P* indicates a lower risk, while the *V/P* ratio has a significant positive relation with *B/P* and *AverCC*, meaning that a higher *V/P* indicates a higher risk. Thus, we cannot draw the conclusion that a high *V/P* ratio necessarily means a higher risk from the above. Therefore, the

[32] To test whether this conclusion results from the multi-linearity that may exist between the variables, we implement the correlation analysis between *V/P* and related variables (omitted for simplicity's sake), and find that there is a significant correlation between *V/P* and *E/P*, *D/P*. As such, we try to remove *V/P*, *E/P*, and *D/P* respectively from model (6) to test the impact on the model. Results show that the adjusted R-square of the model significantly declines when *V/P* is removed from the model, while removing *E/P* and *D/P* from the model has no particular effect on the results; this also indicates that the forecasting power of *V/P* for future stock returns is higher than that of *E/P* and *D/P*.

Table 5-1 Pearson Correlation Coefficients of *V/P* on Risk Factors

		V/P	*Beta*	*LnME*	*B/P*	*D/M*	*Zvalue*	*StdROE*	*AverCC*
V/P	Coefficient	1	−0.065**	0.017	−0.005	0.003	−0.022	−0.086**	0.0363*
	P-value		0.000	0.349	0.770	0.886	0.214	0.000	0.039
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
Beta	Coefficient	−0.065**	1	−0.026	−0.068**	−0.044**	−0.016	0.169**	−0.056**
	P-value	0.000		0.144	0.000	0.013	0.354	0.000	0.002
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
LnME	Coefficient	0.017	−0.026	1	−0.198**	−0.048**	0.072**	−0.451**	−0.446**
	P-value	0.349	0.144		0.000	0.007	0.000	0.000	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
B/P	Coefficient	−0.005	−0.068**	−0.198**	1	−0.021	0.027	0.294**	0.242**
	P-value	0.770	0.000	0.000		0.234	0.130	0.000	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
D/M	Coefficient	0.003	−0.044**	−0.048**	−0.021	1	−0.036*	0.017	−0.051**
	P-value	0.886	0.013	0.007	0.234		0.039	0.351	0.004
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
Z-value	Coefficient	−0.022	−0.016	0.072**	0.027	−0.036*	1	0.009	0.055**
	P-value	0.214	0.354	0.000	0.130	0.039		0.596	0.002
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
StdROE	Coefficient	−0.086**	0.169**	−0.451**	0.294**	0.017	0.009	1	0.517**
	P-value	0.000	0.000	0.000	0.000	0.351	0.596		0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
AverCC	Coefficient	0.0363*	−0.056**	−0.446**	0.242**	−0.051**	0.055**	0.517**	1
	P-value	0.039	0.002	0.000	0.000	0.004	0.002	0.000	
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195

Notes: ** and * denote that the test is statistically significant at the 1% and 5% levels (two-tailed), respectively.

Table 5-2 Pearson Correlation Coefficients of *V/P* on Risk Factors

		V/P	*Beta*	*LnME*	*B/P*	*D/M*	*Zvalue*	*StdROE*	*AverCC*
V/P	Coefficient	1.000	−0.070**	−0.009	0.237*	−0.002	−0.067**	−0.040*	0.148**
	P-value		0.000	0.605	0.000	0.927	0.000	0.023	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
Beta	Coefficient	−0.070**	1.000	−0.011	−0.087**	−0.026	0.005	0.151**	−0.060**
	P-value	0.000		0.529	0.000	0.138	0.777	0.000	0.001
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
LnME	Coefficient	−0.009	−0.011	1.000	−0.287**	−0.065**	0.310	−0.427**	−0.474**
	P-value	0.605	0.529		0.000	0.000	0.000	0.000	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
B/P	Coefficient	0.237*	−0.087**	−0.287**	1.000	−0.076**	−0.121**	0.251**	0.345**
	P-value	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
D/M	Coefficient	−0.002	−0.026	−0.065**	−0.076**	1.000	−0.1814**	0.061**	−0.081**
	P-value	0.927	0.138	0.000	0.000		0.000	0.001	0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
Z-value	Coefficient	−0.067**	0.005	0.310*	−0.121	−0.181**	1.000	−0.188	−0.052
	P-value	0.000	0.777	0.000	0.000	0.000		0.000	0.003
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
StdROE	Coefficient	−0.040*	0.151**	−0.427**	0.251**	0.061**	−0.188**	1.000	0.480**
	P-value	0.023	0.000	0.000	0.000	0.001	0.000		0.000
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195
AverCC	Coefficient	0.148**	−0.060**	−0.474**	0.345**	−0.081**	−0.052**	0.480**	1.000
	P-value	0.000	0.001	0.000	0.000	0.000	0.003	0.000	
	N	3,195	3,195	3,195	3,195	3,195	3,195	3,195	3,195

Notes: ** and * denote that the test is statistically significant at the 1% and 5% levels (two-tailed), respectively.

regression analysis of the above risk factors on the *V/P* ratio forms the basis for further study of the relationship between them. The results are as follows:

Table 6 Regression Results of Model (7)

	Model 7a	Model 7b	Model 7c	Model 7d
Constant	0.580**	0.467*	0.591*	0.548
	(13.404)	(2.855)	(3.026)	(2.765)
Beta	−0.131**	−0.130**	−0.074	−0.069
	(−3.265)	(−3.255)	(−1.859)	(−1.733)
LnME		0.008	0.001	0.004
		(0.709)	(0.097)	(0.318)
B/P				0.014
				(1.240)
D/M				0.003
				(0.488)
Z-value				−0.0004*
				(−2.041)
StdROE			−6.638**	−6.886**
			(−6.026)	(−6.001)
AverCC			1.249**	1.274**
			(4.783)	(4.849)
Adj.Rsq	0.004	0.004	0.016	0.017
N	3195	3195	3195	3195

Notes: ** and * denote that the test is statistically significant at the 1% and 5% levels, respectively; table values represent the slope coefficient on each variable; the value of t-statistics for the slope coefficient is shown in parentheses; Adj.Rsq represents the adjusted R squares from each regression; N is the number of firms in each regression.

Table 6 reports the regression results of model (7). *Beta* is the only explanatory variable in model (7a); *Beta* and *LnME* are the explanatory variables in model (7b); *Beta*, *LnME*, *StdROE*, and *AverCC* are the explanatory variables in model (7c); and model (7d) has all risk factors as explanatory variables. In these four models, because the slope coefficient and its respective significance levels for each variable are very similar, we analyse the regression results of all risk factors on *V/P* in model (7d).

The table shows that the slope coefficient of *AverCC* is significantly positive (t = 4.849), suggesting that firms with high *V/P* have a higher risk and therefore a higher future stock return. But the slope coefficient of *StdROE* is significantly negative (t = −6.001), suggesting that the firms with high *V/P* have a lower risk and therefore a lower future stock return. Thus, the results are the same as those of the analysis of relevant factors in Tables 5-1 and 5-2 and cannot prove that firms with high *V/P* have a higher risk. Therefore, although *V/P* shows a certain correlation with some risk factors, we cannot conclude that the forecasting ability of the *V/P* ratio for future stock returns is attributable to the neglect of certain risk factors. The following analysis provides further proof for this argument.

4.4.2 *V/P* as Independent Variable and Risk Factors as Controlling Variables in the Models

To examine whether the forecasting ability of *V/P* for future stock returns is due to certain risk factors, we add the risk factors as the controlling variables in the regression models with *V/P* as an independent variable; the results are as follows:

Table 7 Regression Results of Model (8)

	K	1	3	6	12	18	24	36
Constant	β_0	0.180	0.520	0.986	1.450	2.067	3.650	4.940
	T-value	3.346	5.669	8.575	5.299	6.755	8.408	9.860
	P-value	0.001	0.000	0.000	0.000	0.000	0.000	0.000
V/P	β_1	0.024	0.044	0.074	0.225	0.292	0.647	0.809
	T-value	4.449	5.072	5.510	6.060	6.649	6.687	6.549
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Beta	β_2	−0.035	−0.055	−0.036	−0.029	−0.048	−0.073	−0.173
	T-value	−3.942	−3.833	−2.077	−0.811	−1.227	−1.212	−2.953
	P–value	0.000	0.000	0.038	0.417	0.220	0.226	0.003
LnME	β_3	−0.015	−0.046	−0.073	−0.150	−0.196	−0.326	−0.454
	T-value	−4.650	−7.893	−9.442	−8.145	−10.341	−11.505	−12.928
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B/P	β_4	0.014	−0.005	0.020	0.055	0.071	0.076	0.086
	T-value	2.682	−0.721	2.340	2.971	3.462	2.373	2.335
	P-value	0.007	0.471	0.019	0.030	0.001	0.018	0.020
D/M	β_5	0.003	0.008	0.008	0.009	0.013	0.016	0.002
	T-value	1.436	1.502	1.664	1.363	1.499	1.190	0.266
	P-value	0.151	0.133	0.096	0.173	0.134	0.234	0.790
Z-value	β_6	−6E-0.6	−2E-0.5	−0.0002	−0.0005	−0.0003	−0.0009	−0.001
	T-value	−0.152	−0.246	−1.601	−1.846	−0.706	−1.792	−2.831
	P-value	0.879	0.806	0.109	0.065	−0.480	0.073	0.005
StdROE	β_7	0.390	1.405	−1.234	4.478	0.707	1.704	15.220
	T-value	0.727	1.747	−1.315	1.729	0.242	0.417	3.321
	P-value	0.467	0.081	0.189	0.084	0.809	0.677	0.001
AverCC	β_8	0.009	0.032	−0.200	−0.293	−0.165	−1.431	−2.981
	T-value	0.093	0.221	−1.302	−0.879	−0.470	−2.488	−3.521
	P-value	0.926	0.825	0.193	0.379	0.639	0.013	0.000
	Adj.Rsq	0.034	0.062	0.079	0.113	0.161	0.189	0.267
	N	3195	3195	3195	3195	3195	3195	3195

Notes: *K* represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β(i) represent the slope coefficients; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Constant represents the value of constant in the regressions; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Table 7 shows that the slope coefficient of *V/P* is still significantly positive after controlling for the risk factors; also, extending the forecasting period gradually increases the slope coefficient (from 0.082 to 1.133 with a forecasting period from 1 to 36 months). The significance level of the slope coefficient is less than 0.01 per cent, while the T-values also increase from 6.824 to 10.588 when the forecasting period is extended from 1 to 36 months. Again this proves that extending the forecasting period significantly increases the predictive power of *V/P* for future stock returns.

In addition, because the slope coefficients and their T-values for *StdROE* and *AverCC* are very unstable in the forecasting period, we conclude that although the two variables have some correlation with future stock returns, they have no predictive power for them. The slope coefficients and the T-values of *LnME* and *B/P* show the effect of "small firms" and *B/P* effects on the Chinese stock market. Observing the slope coefficients and their significance levels with respect to other risk factors, we find that the T-value of the slope coefficient of *Beta* is significant only within a shorter period (six months) at the 5 per cent level. When the forecasting period is greater than six months, its slope coefficient becomes insignificant, suggesting that a firm's risk represented by *Beta* only predicts future short-term returns (less than a one-year forecasting period), while its accuracy grows worse with the extension of time. At the same time, the slope coefficients of *D/M* and Z-value are not significant in all forecasting periods, indicating that a firm's financial risks basically have no relevance to future stock returns.

In short, these data and related analysis provide further evidence for H4.2 that the predictive power of the *V/P* for future stock returns is not driven by its relevance to certain risk factors. After controlling for the risk factors, the *V/P* ratio computed with the RIV model remains strongly predictable for future stock returns.

4.5 Robustness Test

As mentioned above, many methods can be used to calculate stocks returns. To ensure the conclusion based on the impact of the calculations of the stock returns, in this part we use the continuously compounded return employed by Fama and French (1988a,b, 1989) instead of the BHR for the robustness test.[33] The results are shown in Table 8-1. In all forecasting horizons, after controlling for the above-mentioned related factors and with the continuously compounded return instead of the BHR as the dependent variable, the slope coefficients of *V/P* are all significantly positive and increase with the extension of the forecasting period, suggesting that the conclusions above are not affected by the calculation of stock returns.

---

[33] The robustness test model includes all controlling variables and risk factors; the forecasting period K is from 1 to 36 months. For simplicity's sake, the tables on robustness tests show only the slope coefficient and the t-statistics of the *V/P* ratio, and do not report the data of other controlling variables.

Table 8-1 Robustness Test with Continuously Compounded Return instead of BHR as the Dependent Variable

K	B	T-value	P-value	Adj.Rsq	N
1	0.021	4.410	0.000	0.053	3195
3	0.036	4.846	0.000	0.114	3195
6	0.060	5.948	0.000	0.146	3195
12	0.125	6.459	0.000	0.216	3195
18	0.185	7.338	0.000	0.308	3195
24	0.297	8.893	0.000	0.348	3195
36	0.378	9.638	0.000	0.368	3195

Notes: K represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β represent the slope coefficients; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Because many external variables have a certain impact on the valuation model, and because the sample firms in this study belong to different years, this paper also carries out the following two robustness tests:

First, the following dummy variables are added to the models: (1) industry dummy variables: all sample firms are divided into five major industries consisting of Industrials, Utilities, Real Estate, Conglomerates, and Commerce; thus, four industry dummy variables are set up respectively: Utility, Property, Conglomerate, and Commerce, with 1 if the sample firms belong to an industry, and 0 otherwise;[34] (2) the dummy variable "District" on listed locations, with 1 if the sample firms are listed on the SZSE, and 0 otherwise; (3) the dummy variable "Bull" on the stage of the stock markets, with 1 if the sample firms are in a "bull" market, and 0 otherwise;[35] (4) the dummy variable "Fund," indicating a certain stock is held by the Fund, with 1 if the Fund is one of the top 10 shareholders of the sample firms, and 0 otherwise.

[34] The reason that industry dummy variables are not based on earlier calculations by using the average capital costs of the 12 major industries for testing lies with the 12 major industries, since the number of sample firms in the industry is too small to conduct a large sample empirical analysis.

[35] The stage division between a bull market and a bear market; this paper analyses the SZSE and SHSE respectively using the above approach of stage division. Because we find that the bull and bear markets of the SZSE and SHSE are basically the same, we no longer distinguish between them in this study. According to the fluctuations in stock prices, the stock market is a bull market when it is rising, and a bear market when it is declining. The specific division is as follows: from September 1994 to January 1996, from May 1997 to May 1999, and from June 2001 to January 2002, the markets were in a bull phase; the remaining phases were all bear phases.

Second, an annual regression is carried out according to the year to which the sample firms belong. The results of the two robustness tests are shown in Tables 8-2 and 8-3:

Table 8-2 Results of the First Robustness Test

	K	1	3	6	12	18	24	36
V/P	β_1	0.022	0.035	0.055	0.193	0.238	0.603	0.811
	T-value	3.809	4.072	4.356	5.302	5.959	6.455	6.554
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Utility	α_2	−0.006	−0.034	−0.033	0.001	−0.025	−0.020	−0.020
	T-value	−0.619	−2.358	−2.714	0.046	−0.844	−0.479	−0.437
	P-value	0.536	0.001	0.007	0.963	0.399	0.632	0.662
Property	α_3	0.003	−0.052	−0.040	−0.002	−0.021	−0.005	−0.153
	T-value	0.235	−2.735	−1.223	−0.028	−0.311	−0.066	−1.893
	P-value	0.814	0.006	0.221	0.978	0.756	0.947	0.059
Conglomerate	α_4	−0.011	−0.019	−0.024	−0.010	0.001	0.019	−0.037
	T-value	−2.110	−2.306	−2.237	−0.420	0.055	0.471	−0.892
	P-value	0.035	0.021	0.025	0.675	0.956	0.637	0.372
Commerce	α_5	−0.007	−0.011	−0.030	−0.035	−0.053	−0.080	−0.107
	T-value	−1.150	−0.891	−1.803	−1.035	−1.550	−1.526	−1.769
	P-value	0.250	0.373	0.071	0.301	0.121	0.127	0.077
District	α_6	0.010	−0.001	0.021	0.050	0.084	0.122	0.061
	T-value	1.599	−0.175	1.822	2.179	3.513	3.096	1.692
	P-value	0.110	0.861	0.069	0.029	0.000	0.002	0.091
Bull	α_7	0.015	0.005	0.033	0.111	0.159	0.180	0.119
	T-value	1.508	0.372	1.586	2.836	3.606	2.607	1.873
	P-value	0.132	0.710	0.113	0.005	0.000	0.009	0.061
Fund	α_8	0.001	0.012	0.021	0.029	0.020	0.025	0.042
	T-value	0.147	1.670	2.405	1.616	1.065	0.918	1.497
	P-value	0.883	0.095	0.016	0.106	0.287	0.359	0.135
	Adj.Rsq	0.048	0.069	0.069	0.081	0.126	0.167	0.247
	N	3195	3195	3195	3195	3195	3195	3195

Notes: K represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β_1 represent the slope coefficients; the values of $\alpha(i)$ represent the slope coefficients of the dummy variables; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

Table 8-3 Results of the Second Robustness Test

	K	1	3	6	12	18	24	36
Panel A	β_1	−0.005	−0.016	0.069	0.834	1.672	5.508	4.509
1994	T-value	−0.195	−0.237	0.907	3.572	5.762	5.099	5.758
Regression	P-value	0.846	0.813	0.365	0.000	0.000	0.000	0.000
	Adj.Rsq	0.084	0.208	0.215	0.390	0.591	0.526	0.461
	N	245	245	245	245	245	245	245
Panel B	β_1	0.058	0.083	0.125	0.432	0.449	0.794	1.705
1995	T-value	2.783	2.311	2.238	3.499	3.794	5.143	4.335
Regression	P-value	0.006	0.022	0.026	0.001	0.000	0.000	0.000
	Adj.Rsq	0.271	0.231	0.270	0.223	0.227	0.347	0.465
	N	226	226	226	226	226	226	226
Panel C	β_1	0.015	0.118	0.211	0.498	0.561	1.778	1.723
1996	T-value	1.099	2.864	2.488	3.388	4.228	6.215	5.723
Regression	P-value	0.273	0.005	0.013	0.001	0.000	0.000	0.000
	Adj.Rsq	0.061	0.280	0.200	0.335	0.380	0.446	0.426
	N	312	312	312	312	312	312	312
Panel D	β_1	0.019	0.040	0.063	0.253	0.286	0.796	0.909
1997	T-value	2.772	2.797	3.574	3.650	4.429	5.632	5.316
Regression	P-value	0.006	0.005	0.000	0.000	0.000	0.000	0.000
	Adj.Rsq	0.069	0.222	0.164	0.099	0.164	0.266	0.404
	N	563	563	563	563	563	563	563
Panel E	β_1	0.049	0.052	0.103	0.294	0.373	0.469	0.467
1998	T-value	2.188	2.110	2.463	4.075	5.465	6.386	6.241
Regression	P-value	0.029	0.035	0.014	0.000	0.000	0.000	0.000
	Adj.Rsq	0.090	0.174	0.200	0.188	0.304	0.364	0.249
	N	468	468	468	468	468	468	468
Panel F	β_1	0.018	0.034	0.041	0.105	0.199	0.228	0.431
1999	T-value	1.625	1.905	1.630	2.971	5.013	5.778	8.786
Regression	P-value	0.105	0.057	0.104	0.003	0.000	0.000	0.000
	Adj.Rsq	0.105	0.132	0.202	0.276	0.231	0.237	0.244
	N	642	642	642	642	642	642	642
Panel G	β_1	0.005	0.014	0.025	0.045	0.064	0.132	0.155
2000	T-value	1.566	2.951	4.053	4.004	4.515	5.265	5.725
Regression	P-value	0.118	0.003	0.000	0.000	0.000	0.000	0.000
	Adj.Rsq	0.054	0.041	0.080	0.108	0.085	0.233	0.341
	N	739	739	739	739	739	739	739

Notes: K represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β_1 represent the slope coefficients; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance level of the slope coefficients; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

As noted from Table 8-2, adding the dummy variables in the model has no impact on the main conclusions of this paper. In all forecasting periods, the slope coefficients of the *V/P* are all significantly positive and increase with the extension of the forecasting period. The slope coefficients of all dummy variables show that their t-statistics are not significant in most forecasting periods, suggesting that these external variables have little impact on the cross-sectional differences of future stock returns.

After implementing the annual regression for the sample firms of different years, we find that when the forecasting period K is greater than six months, all annual data show that the slope coefficients of *V/P* are significantly positive (P value is less than 1 per cent) and increase with the extension of the forecasting period, which is consistent with the above conclusions. When K is less than six months, the results differ in the annual regression, which again indicates that the *V/P* ratio has strong predictability for future longer-term stock returns, while its forecasting power is not necessarily accurate for future short-term stock returns.

In short, all results of the robustness tests are consistent with the previous findings, which confirms the conclusions of this paper.

4.6 Comparison with the FCF Model

Related research in this category shows that compared with the DDM and FCF models, the RIV model has paramount superiority (Bernard, 1995; Penman and Sougiannis, 1998; Frankel and Lee, 1998; Francis *et al.*, 2000). To test whether this conclusion is effective in the Chinese stock market, in this section we compare these models. Considering Copeland *et al.* (1994) and the specific characteristics within China, we compute a firm's equity value with the following equation:[36]

$$V = \sum_{t=1}^{\infty} \frac{ECF}{(1+r_e)^t} + EC$$

Where V = the firm's equity value;

ECF = the equity cash flow;

r_e = the equity cost of capital, computed with CAPM;

EC = excess cash in the current period, according to the related study by Copeland *et al.* (1994) and Francis *et al.* (2000), defined as cash and securities being more than 2 per cent of the firm's operating income.

Given that the DCF is based on the FCF model, the results of both models are the same when using the same data and assumptions. The DCF is rarely used in China because dividend policies are quite random. An equity cash flow model can replace the DCF model to avoid the trouble of forecasting dividend policy. Thus, this paper only compares the RIV model with the FCF model.

36 Because of the lack of data on debt costs, which affects the calculation of the weighted average cost of capital, this cash flow model uses an equity cash flow model for testing. Theoretically, the results of the calculations using the two approaches are the same.

Lacking the relevant data, this paper predicts stock value using the equity free cash flow model computed using actual data from three periods. For free cash flow following the three periods, we use the arithmetic average of the free cash flow of the previous three periods as the forecasting value.[37] The specific equation of the FCF is as follows:

$$V = EC + \sum_{t=1}^{3} \frac{EFCF}{(1+r_e)^t} + \frac{AFCF/(r_e - g)}{(1+r_e)^3}$$

Where V = the firm's equity value;
ECF = the equity free cash flow;
r_e = the equity cost of capital, computed with CAPM;
EC = excess cash in the current period;
$AFCF$ = the arithmetic average of the free cash flow of the previous three periods;
g = the growth rate.

To test the explanatory power for current stock prices of the two models, we first compare the correlation coefficients of the models with current stock prices; the results are as follows:

Table 9 Comparison of Correlation Coefficients of Two Models

YEAR	N	V(DCF)	V(RIM)
1994	245	0.296**	0.426***
1995	226	0.026**	0.413***
1996	312	–0.038	0.386***
1997	563	0.013	0.370***
1998	468	0.023	0.282***
1999	642	–0.044	0.233***
2000	739	0.043	0.118***
All years	3195	0.046	0.318

Notes: *** denotes that the test is statistically significant at the 1% level; the values of "All Years" represent the average for all year. N is the number of firms; the table values in column V(DCF) are the correlation coefficients of stock values using DCF on current prices; the table values in column V(RIM) are the correlation coefficients of stock values using the RIV model on current prices.

[37] In the FCF model, the greater the investment, the less free cash flow there is, and the lower the firm value. A typical example is Wal-Mart, a US company. Because of its successful operations, the expansion of Wal-Mart is strong in the global sphere, which requires substantial profits to be invested into new projects. Indeed, the free cash flow of Wal-Mart in recent years has been negative. The FCF model cannot be applied, which is one of its main shortcomings. In view of this, for firms with a negative arithmetic average in a three-period free cash flow, we assume the free cash flow to be zero to ensure the reasonableness of the data. Please see Francis *et al.* (2000).

Table 9 shows that whether employing the full-year data or the respective-year data, the explanatory power of the FCF model for current stock prices is far lower than that of the RIV model. The results of all sample periods show that the FCF model explains only 0.212 per cent of the stock price, while the RIV model explains 10.11 per cent; thus, we can draw the preliminary conclusion that with respect to explanatory power and predictability regarding stock prices, the RIV model is far superior to the FCF model.[38]

Based on the above correlation analysis, we use a regression analysis to further compare the forecasting power of these two models for future stock returns. The regression model is as follows:

$$r(t,t+K)=\beta_0+\beta_1 V(RIM)/P+V(DCF)/P+\alpha+e_{t+K,t}$$

Where *V(RIM)/P* is the *V/P* ratio calculated using the RIM model;
V(DCF)/P is the *V/P* ratio calculated using the FCF model;
α includes all controlling variables mentioned above in this study.
The regression results of the model are as follows:[39]

Table 10 Regression Results of the Model

	K	1	3	6	12	18	24	36
V(RIM)/P	β_1	0.022	0.035	0.061	0.189	0.233	0.566	0.759
	T-value	3.948	4.188	4.672	5.319	5.920	6.296	6.128
	P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
V(DCF)/P	β_2	−0.006	−0.006	−0.006	0.053	0.061	0.140	0.169
	T-value	−0.770	−0.480	−0.365	1.248	1.357	1.045	1.497
	P-value	0.441	0.631	0.716	0.212	0.175	0.296	0.134
	Adj.Rsq	0.050	0.095	0.099	0.129	0.210	0.225	0.289
	N	3195	3195	3195	3195	3195	3195	3195

Notes: *K* represents the forecasting horizon, where $K = 1, 3, 6, 12, 18, 24$, and 36 months; the values of β_1 represent the slope coefficient of *V(RIM)/P*; the values of β_2 represent the slope coefficient of *V(DCF)/P*; T-values represent the value of t-statistics for the slope coefficients; P-values are the actual significance levels of the slope coefficients; Adj.Rsq represents the adjusted R squares from the regressions; N is the number of firms in each regression.

As the above table shows, regardless of whether it is short-term or long-term, the forecasting power of the RIV model is much better than that of FCF model; this conclusion is also consistent with the relevant studies.

38 To test the forecasting power of the two models for future stock prices, we also compare the correlation coefficients of the two models with stock prices one year later and two years later, respectively, and draw the same conclusions, which are not reported here for simplicity's sake.

39 For simplicity's sake, this paper only shows the data of V(RIM)/P and V(DCF)/P in the tables; the data of other controlling variables are not listed.

V. CONCLUSIONS

Using the data of A-share listed companies on the Chinese stock market between 1994 and 2004, this paper empirically investigates the power of the Feltham-Ohlson's residual income valuation model in predicting future stock returns. The results show that the *V/P* ratio is a better indictor in predicting future stock returns; also, in the sample period, the longer the forecasting horizon, the stronger the predictive power of the *V/P*. The conclusions are summarised as follows:

(1) Although the correlation of a firm's stock value based on the RIV model with the current stock prices is not high, extending the time period leads to continuing improvement in the correlation of intrinsic value with stock prices.

(2) The *V/P* ratio calculated using the RIV model has a high correlation with future stock returns; the longer the forecasting horizon, the stronger is the predictive power of the *V/P*.

(3) The forecasting power of the RIV model for future stock returns is not a result of firm size (*ME*), book value to price (*B/P*), or other relevant factors; and

(4) Although the *V/P* ratio is relevant to certain risk factors, its predictability for stock returns does not result from a correlation of the *V/P* with these factors.

In addition, related literature shows that the forecasting power of the RIV model for future stock returns mainly derives from analysts' forecasts of a firm's future earnings. Although no analyst forecast data are used, this paper carries significant conclusions. Does this mean that in addition to analysts' forecasts, there are other factors that affect the forecasting power for future stock returns? This problem requires further study.

REFERENCES

Please refer to P.78–81