

## 投资者注意力和应计异象

李小晗 张鸣\*

### 摘要

本文基于认知心理学领域中关于注意力分配的研究,考察了投资者在不同周历阶段下注意力分配差异对盈余构成(会计应计和现金流量)的定价偏差的影响。本文的结果显示,当投资者注意力分散时,认知资源受到限制,对盈余信息的解读能力降低,导致了对盈余构成的定价偏差,产生了应计异象;而当投资者注意力集中时,认知动机增强,对盈余信息的解读更为透彻,能够对盈余构成正确定价,不存在应计异象。随着基金持股比例的增加,注意力对于信息解读的影响作用减弱,说明发展以基金为首的机构投资者队伍有助于投资者信息解读效率的提高,增强资源配置的有效性。另外,投资者的情绪和心态在不同的市场状态下会出现差异,进而对投资者的注意力分配和认知需要产生影响,投资者注意力对定价偏差的影响作用主要体现在牛市阶段。

关键词:投资者注意力、定价偏差、应计异象、认知需要、市场状态

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\* 李小晗,中国金融期货交易所博士后工作站博士后,电邮:lxfan2009@gmail.com。张鸣,上海财经大学会计与财务研究院教授、博士生导师。作者感谢两位匿名审稿人和本刊执行编辑吴东辉博士的宝贵意见和建议,以及美国联邦储备委员会李灿林教授和上海财经大学会计与财务研究院朱红军教授提供的帮助,但文责自负。

## 一、引言

会计盈余是对公司当期经营成果的反映,是资本市场上最重要的也是投资者最为关注的信息之一。会计盈余信息的任何内在特征都有可能导致投资者的反应(定价行为)出现偏差。盈余的持续性则是衡量盈余质量的重要指标之一,是投资者据之预测企业未来年度盈余,评估股票内在价值,制定投资决策的重要指标。在应计制会计下,会计盈余由经营活动现金流量(以下简称现金流量)和会计应计两部分构成,盈余的持续性取决于其中现金流量和会计应计的相对比例。应计项目的存在是为了减少现金流量在衡量公司业绩时较弱的及时性和配比问题(Watts and Zimmerman, 1986; Dechow, 1994; Dechow *et al.*, 1998),从而提供更多价值相关的补充信息。然而,应计项目的这一特性导致其可靠性会受到一定的影响。由于应计部分包含了更广的会计政策选择空间,需要会计人员更程度的主观判断,因此,更容易出现估计误差,同时,公司对会计应计进行操纵的可能性要高于现金流量,这就导致了会计应计的持续性要低于现金流量的持续性。投资者根据会计盈余信息对股票定价时,应该合理地反映现金流量和会计应计在持续性方面的差异,但Sloan (1996)发现投资者不能正确区分这两部分的差异,会高估会计应计的持续性而低估现金流量的持续性。投资者对盈余构成的定价偏差导致了会计应计较高(较低)的公司未来负(正)的异常超额回报的可能性更大。因此,通过构造基于会计应计的套利策略,能够在未来一年中赚取10%左右的超额回报。

应计异象的发现显然与投资者理性以及无套利理论不符,因而对有效资本市场假说进一步提出了挑战。Sloan (1996)的文章在学术界和投资界引起了强烈的关注,投资者之所以钟情于市场异象,是因为它为提高组合收益提供了潜在机会;研究者之所以热衷于市场异象,是因为它提供了一个挑战现有理论的机会,通过对异象的研究,一些新的市场定价理论或是投资者行为理论以及新的研究方法将会被引入(Zach, 2003)。

在对应计异象成因的解释中,基于行为金融学角度出发的由于投资者注意力不足导致对盈余信息解读不完全是广为接受的原因之一。投资者对信息的加工处理需要时间和成本,由于投资者的有限理性和有限注意力,往往不能够正确、充分地理解盈余信息,从而导致了定价偏差的发生。中国证券市场在制度背景、市场发展程度以及投资者理性程度上与成熟市场之间还存在差距,政策市特征明显,散户投资者盲目追涨杀跌,投机炒作,股市波动剧烈,市场非效率因素在我国资本市场广泛存在。因而,在对我国证券市场应计异象的研究中,这些市场非效率因素对其形成将发挥关键作用。

本文以个体间有差异的注意力程度作为切入点,从认知心理学的相关理论出发,检验了投资者注意力程度在时间序列层面上的差异与其对盈余构成的定价能力的关系,并结合外界的市场状态,检验了在股市周期的不同阶段,上述影响作用的变化趋势。本文发现,当投资者注意力集中时,其信息解读能力增强,能够对会计应计和现金流量的持续性进行正确地判断,不存在对盈余构成的定价偏差,不存

在应计异象；而当投资者注意力分散时，投资者不能够及时、准确地对信息进行解读，导致了对盈余构成的定价偏差以及应计异象的产生。随着基金等机构投资者持股比例的增加，注意力对信息解读的影响作用减弱。另外，投资者注意力分配和认知需要在牛熊市下会出现不同程度的变化，与熊市阶段相比，注意力差异对盈余构成定价偏差的影响在牛市阶段会得到进一步地放大。

本文的主要贡献在于，将行为金融学的有限注意与会计的应计研究两方面相结合，动态地研究了投资者注意力对盈余构成定价偏差的影响，即投资者对信息的解读能力如何受到其投入的注意力程度的影响。信息在资本市场中的定价作用一直是学者关注的焦点问题，尤其是在我国这样一个处于新兴加转型过程的市场中，这个问题更有其特殊的意义。过去的研究主要是从信息的生产视角，静态地研究信息披露、信息质量是否能够促进资本市场的定价功能，鲜有研究以投资者心理和行为模式入手，考察投资者的注意力对信息在资本市场中传播效率的影响。本文则试图填补这方面的不足。本文的研究有助于研究者更深入地理解市场效率、价格的形成等基本问题，并且能够帮助投资者正确定价、提高资本市场配置资源的效率。同时，本文的发现也为基于非有效市场基础上提出的应计异象的成因提供了新的证据。

后续结构安排如下，第二部分为相关文献回顾；第三部分是理论分析和假说发展；第四部分主要是样本选择和变量定义；第五部分是实证检验及结果分析；第六部分为敏感性分析；第七部分为全文的结论。

## 二、文献回顾

### (一) 应计制导致的定价偏差

应计制会计转移或调整了现金流量在时间上的确认，试图在相关性和可靠性中取得平衡，但为了获得更大的相关性，必须以牺牲可靠性为代价。Barth *et al.* (2001) 指出，应计制会计使当前盈余和当前现金流量均成为了未来现金流量的有偏估计量。应计制过程涉及的会计估计导致了暂时性盈余，与现金收付制相比更容易出现估计误差。会计估计偏差主要体现在应计项目上，并且具有均值回归的特征 (Watts, 1993; Dechow, 1994)，这一特性将导致盈余的应计成分的持续性低于现金流量成分的持续性。

Sloan (1996) 发现投资者不能正确识别会计盈余中所包含的信息，倾向于高估会计应计而低估现金流量，导致了对股票的定价错误。应计异象的存在性已经得到了广泛的认可 (Xie, 2001; LaFond, 2005; Pincus, Rajgopal, and Venkatachalam, 2007)，但究其成因，尚无一致的定论。在关于应计异象出现原因的研究上，可以分为两大类。第一类解释是基于有效资本市场假说的研究，认为应计异象不过是风险溢价的表现。如一些学者认为应计异象的存在只是由于研究设计中没有充分控制上市公司的系统性风险因子，从而把正常回报错误地归于超额回报 (Fama, 1970; Khan, 2005)；不同会计应计大小的公司可能本身的财务风险不同，导致了所谓的应计异象 (Zach, 2003; Dechow and Ge, 2005)。然而，Khan (2005) 所使用的风险四因素没有坚实的理论基础，也缺乏实证上的经验支持。对应计异象的第二类解释是基于非有效市场的基础上，认为应计异象的存在是投资者错误定价、市场缺乏有效性的证

据。这类研究又可以按照是否存在管理层的操纵行为划分为两大类：一类认为管理层的操纵行为造成了会计应计的低持续性，从而影响到投资者的定价(Xie, 2001; Beneish and Vargus, 2002; Zach, 2003; Kothari *et al.*, 2006)；另一类认为会计应计的低持续性是由于增长的低持续性或管理层的预测误差造成的，而非管理层的盈余操纵(Collins, Gong, and Hribar, 2003; Richardson *et al.*, 2005)。基于市场非效率的应计异象成因研究认为，由于信息成本的存在，投资者在理解会计应计的价值相关性上存在着系统性偏差，投资者的功能锁定导致了错误定价，造成了应计异象的出现。同时，即使投资者观察到了错误定价，由于套利的成本和风险都比较高，并不能迅速恢复市场效率(Lev and Nissim, 2006; Mashruwala, Rajgopal, and Shevlin, 2006)，所以我们在证券市场上会观察到应计异象。

近几年来，我国部分学者也开始对应计异象进行了检验。刘云中(2003)沿用Sloan(1996)的方法，使用1998年到2000年的数据进行检验，发现会计应计的持续性低于现金流量，但是他按照Sloan(1996)的投资策略，其超额回报平均只有3.1%左右。王庆文(2005)发现，在剔除ST和PT公司后，Sloan(1996)投资策略在未来一年的累计超额回报(CAR)为9.7%。姜国华、李远鹏和牛建军(2006)针对AB股的研究表明，中国AB股市场上存在着显著的应计异象，并且还存在着国内外盈余报告差异异象，从而说明会计准则的差异也会影响市场的效率。李远鹏和牛建军(2007)的研究结论表明，中国的退市制度对亏损公司的行为及其价值产生了很大的影响，从而应当在研究设计中予以控制。

相对于国外的研究而言，我国关于应计异象的研究还远不够系统，仍停留在对其存在性的探索上，关于应计异象成因的研究还不多见。会计信息的首要作用就是决策有用性，而这又是通过权责发生制下的会计应计实现的，如果投资者无法理解会计应计的含义，那么会计信息在投资者对股票进行定价时所能发挥的作用就会受到制约。因此，我们有必要对应计异象的原因进行深入研究，它不仅是理解资本市场价格发现过程的重要组成部分，也是评价和指导会计准则制定的基础性的研究。

## (二) 投资者的有限注意及其表现

注意力是一种稀有资源，它是认知资源从一种任务对另一种任务上的一种替代。Kahneman(1973)提出注意力模型，认为注意力是一种基于对外界信息输入处理的有意识活动，总体上的处理能力可以由于外界的刺激而增加或减少，同时存在决定各种意识资源分配和各个处理阶段的规则和策略。Kahneman(1973)认为，由于人们的信息处理能力有限，同时对这些信息的筛选需要付出努力，故有限注意力是在一个具有大量信息环境下的必然结果。

在决策时，如果要同时完成多个任务，有限注意不可避免。注意力分散的情况下人们会对相关刺激的反应下降，注意力的有限性会导致其对信息的处理效率降低(Cherry, 1953; Broadbent, 1958; Moray, 1959; Simmons and Levin, 1997)。当多个刺激同时发生时，任务完成的效果非常差(Treisman and Davies, 1973; McLeod, 1977)。

尽管市场中存在与公司相关的特定信息，但是由于人类在同时处理信息和执行任务时的能力是有限的，因而投资者行为会较注意力程度不同时出现有差异的表现。在股票市场上，有限注意力具体表现为由于时间和精力有限性，使得投

投资者不可能考虑所有的相关信息，对信息的分析能力会受到一定的约束(Aboody *et al.*, 2008)；投资者因不具备充分的处理和吸收所有可得信息的精力和能力，会导致对联系股票基本面的相应信息反应不足的情况(Engelherg *et al.*, 2009)。Daniel *et al.*(2002)在一篇综述性的文章中提出，投资者的有限注意能够帮助我们解释市场对于新信息的反应。有限注意也为市场中存在的各种异象提供了很好的解释，如股权溢价之谜(Lynch, 1996; Gabaix and Laibson, 2001; Rogers, 2001)、对未预期盈余(Hirshleifer and Teoh, 2003; Hou, Peng, and Xiong, 2008)和收益预测的不足反应(Doyle *et al.*, 2003)、对周五披露盈余信息的价格反应(DellaVigna and Pollet, 2009)、对公司高水平的净营运资产的过度乐观性(Hirshleifer and Teoh, 2003)、盈余公告日附近的平均股价升高(Frazzini and Lamont, 2007)、盈余公告日附近的个人投资者非正常水平的购买股票(Barber and Odean, 2008)以及对分析师荐股的反应不足(Loh, 2009)等。

大量文献指出不管是个人投资者还是机构投资者，其决策判断和行为模式都会受到有限注意的影响。Hirst and Hopkins(1998)证实了即使是具有专业技能的财务分析师往往也不能及时、正确地对复杂的财务披露做出反应。Hirshleifer and Teoh(2003)发现在投资者只有有限注意力的时候，公司的不同信息披露方式会对公司股价产生影响，比如披露的信息内容上等价而形式上不同也会对投资者的行为感觉产生影响。Peng(2005)及Peng and Xiong(2006)指出有限注意的投资者会倾向于简单的种类决策规则，仅仅会关注证券市场上公司的行业面，而不是特定的公司状况。

### (三)有限注意对定价偏差的影响

由于投资者吸收和处理信息的能力有限，在有限注意状态下，即使有影响相关公司盈利事件的发生，也不会对其股票价格产生大的影响，也就是说，事件效应并未反映到公司股票价格上，或者说股票价格产生了错误的定价。

DellaVigna and Pollet(2009)检验了周五和非周五(剔除周末样本)公告对于投资者信息解读的影响，发现投资者在周五对股票市场和日常商业活动会给予更少的注意力，因此，与发生在非周五的盈余公告事件相比，在周五公布的盈余信息更容易被投资者忽视，投资者对盈余信息解读不完全，产生了对股票的定价偏差，导致股价对信息的立即反应减弱，滞后反应增加。Hirshleifer, Lim, and Teoh(2009)指出由于投资者的注意力有限以及信息处理需要时间和成本，投资者的注意力会受到同一天发布的盈余公告数量的影响，如果在同一天发布盈余公告的公司数量越多，会增加投资者在信息处理时的难度，使得投资者不能对盈余信息做出及时反应，出现对股票暂时性地定价偏差。Hou, Peng, and Xiong(2008)分别以不同的市场状态和换手率的大小来代表投资者对股票注意力程度的高低，研究了投资者注意力对于价格惯性异象和盈余惯性异象的影响，他们发现，投资者对于盈余信息的反应过度现象会随着注意力集中程度的增加而增强，投资者对盈余信息的反应不足现象会随着注意力分散程度的增加而增强。Jin(2009)以分析师跟进数量、机构持股比例和是否经国际四大所审计等衡量公司所受到的注意力程度的差异，发现投资者注意力的集中会降低股票中定价偏差的可能性，即受到更多分析师跟进、更多为机构所持股以及经过国际四大所审计的公司，投资者对其定价偏差程度显著减弱。Ali and Gurun

(2009)检验了投资者构成类别与会计应计定价偏差的关系,他们指出和机构投资者相比,个人投资者更容易受到有限注意的影响,他们以公司规模来衡量机构投资者持股比例的高低,发现公司规模越大,即被机构投资者持股的比例越高时,越不容易受到有限注意的影响,投资者对其盈余构成的定价偏差程度越低。

#### (四) 投资者心理和行为在不同市场状态下的表现

在不同的市场状态下,投资者的心理预期存在着较大的差异,这些差异将直接导致其投资心理和行为选择的异化。Economist(2002)指出,在牛市阶段,由于投资者情绪高涨,对前景过分乐观,从而不会对财务信息进行仔细审查,在理解财务信息时所投入的实际注意力程度小于他们原本能够投入的注意力水平。Povel, Singh, and Winton(2007)指出和股市萧条时期相比,投资者在股市繁荣时期对财务报表信息解读所投入的精力更少,财务报表中存在的问题在股市繁荣时期往往更容易被隐藏。Ali and Gurun(2009)指出在情绪高涨时期,投资者在决策时投入的注意力程度更少,更加不会关注盈余中的不同组成成分在持续性上的差异,导致有限注意的影响在投资者情绪高涨时更加强烈。李小晗(2009)以月相变化周期来衡量投资者的情绪周期,发现股票收益会随着投资者情绪的波动而呈现出同样频率的循环性波动,并且,该影响在牛市阶段会得到进一步地放大。林树和俞乔(2010)发现投资者非理性化的“情绪冲动”在不同市场状态下的表现存在不对称性,资产价格处于高位时,投资者情绪会显著影响到其交易决策,体现出非理性的一面;而资产价格处于低位时,非理性化的情绪指标则不会显著影响到投资者的交易行为,此时的交易行为更多地受到基本信息的影响。李灿林、李小晗和吴国俊(2010)指出在美国的证券市场中,公司治理程度会影响投资者对盈余持续性的信心,进而影响投资者对未预期盈余信息的反应程度,而这一影响作用主要受到了牛市阶段的驱动。淳于松涛、杨春鹏和杨德平(2007)研究发现,基金作为机构投资者的主要组成部分,其投资行为仍然随着市场的走势变化,即机构投资者的心理和行为随着市场的波动也会表现出不同的特征。

建立在对上述文献分析的基础上,可以看出,近几年来,从投资者的注意力入手,研究注意力对投资者交易行为和信息解读影响的这一主题在国外受到了越来越多的重视。然而,值得注意的是,国内从注意力的角度来研究投资者的信息解读能力和决策行为的文献还不多见,尤其是将行为金融学的有限注意与会计的应计研究两方面相结合,从行为的角度来研究应计异象的文献更少。因此,本文拟对这一问题进行探索,另外,本文还结合外界的市场状态,研究了投资者心态和情绪在股市周期不同阶段下的差异对于上述影响的作用。

然而,投资者注意力很难直接观测,多数文献均采用一些表征变量,如换手率、机构持股比例、分析师跟进数量、公司规模和公司投入广告费用的多少等,来间接地对投资者注意力进行衡量。这些指标虽然在一定程度上能够体现投资者注意力的大小,但潜在的噪音比较大,因为这些指标本身都是从证券市场中所提取出来的,是金融资产本身的交易特性和价格行为。而且,随着证券市场的不断发展和成熟,如机构和分析师的队伍都在不断壮大,导致不同时期的注意力数据不具有可比性。周历阶段则是一个外生的独立于证券市场的指标,相对于上述指标来说,利用

它在衡量投资者注意力的时候更为纯粹，可以使研究避开复杂的社会影响。另外，周历的变化是恒定的，是不分年度、不分市场、不受公司特征影响的，使得检验投资者注意力对于信息解读影响的普遍性和持续性成为可能。同时，周历阶段的变化对于经济和社会活动的冲击很小，于是，考察基于周历阶段来衡量的投资者注意力与信息解读效率之间的关系，也可以作为注意力是否影响资产定价和决策行为的有效检验。因此，本文选用了不同的周历阶段来衡量投资者注意力的分配差异，结合认知心理学领域中关于注意力的唤醒理论和认知资源理论的研究，我们提出，和工作日相比，投资者在周末时情绪唤醒水平更低，注意力更为集中，可利用的认知资源更为充分。

值得说明的是，尽管 DellaVigna and Pollet (2009) 也以周历阶段来衡量投资者注意力，但我们的研究设计和他们是不同的。首先，DellaVigna and Pollet (2009) 研究的是投资者注意力对于识别未预期盈余能力的影响，我们研究的则是注意力对于盈余构成定价能力的影响。其次，美国的盈余公告信息很少在周末发布，因此，DellaVigna and Pollet (2009) 删除了周末公告样本；而我国周末公布盈余信息的公司约占 23%，<sup>1</sup> 另外，很多政策性消息也都是在周末公布的。由于股价在周一的走势一部分体现了投资者对于上一个周末的盈余信息的反应，另一部分则体现了投资者对于周一当天所发布的盈余信息的反应，当周末发布的盈余公告占比较大时，删去周末公告样本会造成很大的误差，因此，在对于中国证券市场的检验中，我们不能将周末宣告的样本删除。再次，虽然中美投资者自身的机理特征是相同的，注意力程度在不同周历阶段下的分配结构是类似的，但由于中美披露机制、文化背景和经济制度等的不同，造成我国股市中投资者注意力的分配差异对信息解读影响的表现形式和程度可能与英美等成熟市场有所不同。Rebok (1987) 指出，当注意系统被激活程度不同时，对知觉的信息输入也不同，最终表现出来的对信息的理解程度是内外刺激相互作用的结果。因此，即使注意力一定，由于受到不同的激活程度，对信息的理解程度也会出现较大差异。例如，由于美国的盈余公告几乎不会在周末发布，就导致虽然投资者在周末有更多的注意力能力，但这些注意力不会被唤起。而在中国，长久以来大部分的盈余信息和政策性消息都是在周末公告使得投资者形成了在周末更关注股票市场的习惯，周末成了中国投资者持续的关注兴奋点。最后，中国的投资者构成类别、组成结构和国外有所不同，中国仍然是中小投资者主导的市场，同时，中国股市的同步性较高，市场层面信息和板块层面信息在资产定价时发挥着主导作用，这些投资者构成和制度背景上的差异，可能会对于投资者注意力对信息解读效率的影响产生不同于国外市场的交互作用。上述这几点原因也激发了我们在中国证券市场中考察注意力对于投资者信息解读和决策行为影响的必要性和趣味性。

<sup>1</sup> 我们从 Compustat 中提取了美国上市公司盈余公告日期的数据，发现在美国，周六和周日发布的盈余公告占比非常小，周六公布约占 0.088%，周日公布约占 0.098%。同时，我们检验了 1998-2006 年中国上市公司的盈余公告日期数据，发现在周一、周二、周三、周四、周五和周六发布的盈余公告占比依次为：4.69%、23.13%、14.68%、15.57% 和 19.20% 和 22.73%。

### 三、理论分析和假说发展

决策过程是建立在对信息的加工、分析、改造和整合的基础之上的，决策者通过对给定的已知信息进行分析、处理，查找和挖掘已知信息中隐含的相关信息资源，然后进行整合、再加工，形成统一的具有正确逻辑意义的方案，并执行方案，这就是决策结果形成的过程。在决策过程中，人们在注意的认知资源、主观能动性、认知需要和投入的认知努力上的差别，会影响个体对信息加工的深度，最终影响到决策结果。

Kahneman(1973)指出，注意是心理活动对一定对象的指向和集中，是认知活动的重要条件。个体在对刺激信息进行分类与识别的过程中会受到认知资源有限性的制约，认知资源有限性是相对的，不是一个固定的数量值，它与唤醒连接在一起，在某段时间内，唤醒水平将决定注意的认知资源数量。同时，认知资源的适宜分配又决定了个体对信息的加工效率，认知资源的分配机制是灵活的，它能根据人的实际需要来调节与控制，优先加工自己更熟悉的任务。因此，个体对信息的处理能力会受到注意的唤醒和分配两个方面的共同作用。

注意的信息加工理论主要包括唤醒理论、选择性注意理论和分配性注意理论。根据“注意力的唤醒理论”，唤醒水平是指机体总的生理性激活的不同状态或不同程度，是调节人们对信息能否有效利用的一个重要变量，它为注意力的保持与集中提供能量(张力为和任未多，2000)，会对注意过程产生影响(Easterbrook, 1959; Bacon, 1974; Nigg, 2006; 马启伟和张力为，1998)。情绪唤醒会消耗个体的认知资源，在低唤醒状态下，如当个体处于平静和放松的状态时，推动个体进行反思和认知调节以及注意力和自我控制的冷系统发挥主要作用，可利用的认知资源较为充分，注意力较为集中，个体能够广泛收集并加工线索，认知效率较高(Kahneman, 1973; Mischel and Ayduk, 2002)；随着唤醒水平的升高，如当机体处于焦虑和紧张的状态时，倾向于回避或者远离行为的热系统开始占据支配地位，较高的情绪唤醒会消耗部分认知资源，从而导致个体分配给其他信息的注意资源减少，注意能力下降(Eysenck and Calvo, 1992; Runco and Pritzker, 1999)，来自外部环境的信息范围会受到限制(Bahrick, 1954)，而有限的注意又会使得原已较高的唤醒水平继续提高，从而导致注意力更加分散(Easterbrook, 1959; Janelle, Singer, and Williams, 1999; Janelle, 2002)，认知效率降低。即个体的情绪唤醒水平会影响注意力的分配，进而影响认知操作效率，根据Yerkes-Dodson定律(1908)，对于任何一项认知操作活动，均存在情绪唤醒水平的最佳点。情绪唤醒水平的最佳点随着操作活动的复杂性而变化，活动越复杂，唤醒水平的最佳点越低(Broadhurst, 1957; Wolford and Hollingsworth, 1974)。Mano(1992)和Franken(2005)均指出欲得到最佳业绩表现的方法就是要学会如何通过控制自己的唤醒水平来使得注意力更为集中、增加可利用的认知资源，即个体要学会如何放松。建立在唤醒理论的基础上，部分文献检验了个体的情绪唤醒水平对于成绩表现和决策行为的影响，如Weingartner *et al.*(1981)发现与低情绪唤醒的被试相比，高情绪唤醒的被试对于需要更多努力的记忆任务表现更差；Ellis *et al.*(1991)发现，当任务难度较小时，高情绪唤醒对回忆成绩的影响很小或无影响，当难度加大时，高情绪唤醒对成绩表现的负作用会增大；丘扶东和吴明证(2005)研究了情绪唤醒水平对旅游决策的影响，发现高情绪唤醒水平会导致认知失调，从而



影响决策行为；俞国良和董妍(2007)发现低唤醒情绪对注意的认知加工有促进作用，在积极低唤醒情绪下，被试的反应时间最短，能力被抑制越少，而高情绪唤醒时，会使得对正在从事的认知活动所能够分配的注意力资源减少。

根据注意力分配理论中的“注意力的认知资源理论”，人脑对信息处理是串行加工的，一个人同时执行两个或两个以上任务时会涉及到注意力的协调和分配问题。注意力可视为对刺激信息进行识别和加工的认知资源，其容量或能量是有限的。每一项认知活动都需要占有和消耗一定的认知资源，如果刺激信息比较复杂，就需要更多的认知资源，如果需要同时完成几项复杂任务，认知资源就会很快消耗殆尽，此时对于新呈现的刺激信息将不会再被加工与处理，即不会被注意。这就导致了任何需要注意力的任务，在大部分情况下，只能一次完成其中一件，同时进行两种或两种以上活动的可能性要依赖于任务的难易程度、任务的相似性、个人的技能和练习情况等因素。在注意力分配上，欲加工处理的任务的难度会影响注意分配的进程。一般来说，当一项难的任务与另一项相对容易的任务发生冲突的时候，相对容易的任务更可能被加工或处理。<sup>2</sup> 建立在认知资源理论的基础上，部分文献研究了多重任务下的注意力分配对于认知效果的影响，如李小骝和鲍政栋(2000)指出，相对于短跑来说，跳箱是一种比较复杂的运动项目，需要消耗更多的认知资源，当运动员的注意力有限时，对于短跑这一简单项目的成绩没有太大影响，但是会对跳箱项目的成绩产生较大的负面影响；王蕾和黄希庭(2005)发现，在注意资源充足时，无论外界的线索是否明显，都会得到充分的信息加工，而当注意资源受到限制时，明显的线索无需太多的注意资源便可得到充分地加工，而对于不明显的线索，由于处理难度较大，缺乏的注意资源使得该线索不能得到充分地加工；林文毅和张丹玲(2006)指出，焦虑会占用工作记忆系统中的资源，分散个体的注意力，对于难度较低的任务，由于对认知资源的要求不高，即使焦虑情绪已经占用了相当的资源，个体仍可以使用剩余的认知资源顺利完成任务，而对于难度较高的任务，需要使用复杂的有意识加工，此时，有限的注意力会导致对该任务的低加工效能。

影响注意力的因素有刺激物的物理特性，外界环境，人的需要、兴趣、情感和意志，以及已有的知识与经验等。不同的周历阶段即可视为外界的刺激变量，会影响到个体注意力的唤醒和分配，进而影响到对决策任务的加工效率。

加拿大心理学家Debbie Moskowitz对个体的行为规律进行研究发现，个体的生理、机体状态和组织工作效能在一周内会出现周期性变化(Cranford *et al.*, 2006)。Durkheim(1951)指出，与工作日(即周一、周二、周三、周四和周五)相比，个体在周末的精神状态更为平静，机体状态更为放松；Dodds and Danforth(2009)以及Ryan, Bernstein, and Brown(2010)调查发现，由于个体在周末时无需受到日常工作的约束，可以自由支配和掌控自己的时间，从事更多休闲性的活动(Sheldon *et al.*, 1996; Zhong *et al.*, 2008)，因此，个体在周末时普遍会感到更为放松，情绪唤醒水平更低(Rybczynski, 1991; Fritz and Sonnentag, 2005)，从而能够将注意力集中在有助于个体达成目标的行为中，意识水平更高，能够广泛收集并理性地加工线索，有助于促进认知操作活动(Storbeck and Clore, 2008)。Rossi and Rossi(1977)和Hockey, Maule, and

<sup>2</sup> 梁宁建，2003，《当代认知心理学》，上海：上海教育出版社，1-28，85-106。

Clough (2000) 通过问卷调查和行为观察实验发现, 和周末相比, 个体在工作日时受到日常工作的束缚 (Reis *et al.*, 2000; Zhong *et al.*, 2008), 会感到更加焦虑、烦躁以及更大的压力, 精神状态更加紧张, 情绪唤醒水平较高 (McFarlane, 1981; Larsen and Kasimatis, 1990; Kennedy-Moore *et al.*, 1992; Mano, 1992), 而情绪唤醒会消耗部分注意力资源, 从而使得可利用的认知资源减少, 注意力变得愈加分散和过度敏感, 个体进行自我整合的机会减少, 认知操作活动会受到抑制或干扰 (Thayer, 1989)。另外, 在不同的周历阶段下, 投资者需要同时处理的任务的数量和难度不同, 在工作日时, 由于需要对日常工作事务进行处理, 此时如果证券市场中出现年报、中报等盈余信息, 就会涉及到注意力程度在处理日常工作和解读盈余信息双重任务之间分配的问题; 而在周末, 投资者的自由时间增多, 工作事务的干扰效应较弱, 不会涉及到注意力在两个任务之间的协调和分配问题。

因此, 结合个体的生理机体状态、行为规律和任务量在一周内的变化, 以及在“注意力的唤醒理论”和“注意力的认知资源理论”的基础上, 可以发现: 在工作日时, 处理日常工作和解读盈余信息的双重任务需要投资者有更多的认知资源来完成, 但此时较高的情绪唤醒水平限制了可利用的认知资源的数量, 与理解证券市场中的盈余信息相比, 处理日常工作对于投资者来说属于相对容易的任务, 会优先得到加工, 故对于解读盈余信息这项任务所能够分配的注意力的认知资源减少, 会根据已知的任务线索、直觉以及以往的经验快速地做出决策, 对盈余信息的解读效率降低; 而在周末时, 投资者不会受到双重任务的困扰, 决策任务比较单一, 并且此时较低的情绪唤醒水平使得投资者的注意力更为集中, 拥有更充分的认知资源, 故对于盈余信息解读这项任务所能够分配的注意力资源增多, 投资者会对信息进行主动加工和思考, 积极探索、搜集与决策任务相关的各种信息, 处理效率增加, 减弱了定价偏差的可能。在此基础上, 本文提出如下研究假说:

**假说一: 会计应计的持续性低于现金流量的持续性, 对于工作日发布的盈余公告信息, 投资者无法识别这种差异, 会高估会计应计的持续性, 而低估现金流量的持续性, 导致对盈余构成的定价偏差; 对于周末发布的盈余公告信息, 投资者则可以识别这种差异, 不存在对盈余构成的定价偏差。**

会计盈余的持续性是衡量盈余质量的重要指标之一。持续性越高的盈余, 投资者据之预测企业未来年度盈余的准确性越高; 持续性越低的盈余, 则投资者高估企业未来盈余的可能性越大, 在下一期盈余公告的时候, 质量较低的盈余就会发生下降, 从而导致股价的下跌。当会计盈余一定时, 由于会计应计和现金流量呈负相关关系, 故接下来主要以会计应计为例进行检验。高会计应计企业的盈余持续性较低, 假如投资者对盈余信息进行了正确地解读, 则市场中将不存在定价偏差; 而若投资者没有完全理解到盈余的应计部分和现金流量部分的持续性差异, 高估了会计应计, 则会对股票出现定价偏差, 导致高应计企业的未来回报更低。在此基础上, 提出本文的第二个研究假说:

**假说二: 与周末发布的盈余公告相比, 投资者对工作日发布的盈余公告信息的定价偏差程度增加, 即当期会计应计和未来累计超额收益率的负向关系增强。**

股市周期是指股票市场长期升势与跌势更替出现、不断循环反复的过程。在不同的市场环境下，投资者的情绪和心理预期存在较大的差异，这些差异会直接导致其投资心理和行为选择的异化，影响到注意力的分配。在牛市阶段，利好消息往往被强化，利空消息被弱化，投资者会高估股票未来的收益率(Lee, Shleifer, and Thaler, 1991)，对宏观面、上市公司的盈利前景及其所持的投资组合更为看好，对股票未来的业绩和后市看法更为乐观(Baker and Stein, 2004; Karlsson, Loewenstein, and Seppi, 2005; Liu, 2006)，因此不太担心由于分析不足所导致的定价偏差而带来的潜在损失，投资者的认知需要减少，注意力程度减弱，不愿投入较多的认知努力去搜集相关信息，对决策任务的探究欲望不强，倾向于立即决策。而在熊市阶段，投资者信心不足，对宏观面和上市公司的盈利前景看差，决策行为较为谨慎，认知需要增加，更愿意花费精力去解读公司的盈余信息，倾向于暂缓决策。

可见，外界的市场状态会对投资者的注意力分配和认知需要产生影响，而这一影响程度的大小取决于投资者注意力程度的高低。对于周末发布的盈余信息来说，由于投资者本身就会给予的注意力程度较高，认知动机较强，故其受市场状态的影响作用不大。对于工作日发布的盈余信息来说，投资者对其投入的注意力程度多少受到市场状态的影响则更为突出，在牛市阶段，投资者原本就有限的注意力程度而导致的较弱的主动搜集信息的动机会进一步减弱，加剧了定价偏差的程度；而在熊市阶段，投资者决策较为谨慎，尽管所能够投入的注意力程度有限，但认知需要会较牛市阶段有所增强，会尽量搜集更多的相关信息来辅助决策，定价偏差会得到一定程度的抑制。因此，在牛市阶段下，投资者有限注意力对定价偏差的影响作用更为强烈，即由于盈余公告发布时刻不同所引发的投资者注意力程度差异对其信息解读能力的影响作用会更为突出。建立在上述分析的基础上，提出本文的第三个假说：

**假说三：投资者注意力差异对会计应计定价偏差程度的影响在股市周期的不同阶段下有所不同，在牛市阶段，投资者有差异的注意力程度对于定价能力的影响作用更强。**

## 四、样本选择和变量定义

### (一) 样本选择

本文选用了1998至2006年非金融企业所有A股上市公司作为研究样本。我国的上市公司自1998年开始披露现金流量表，因此，我们的样本期间始于1998年，另外，由于2007年开始，企业的财务报告按照新会计准则编制，所以我们的样本期间截止到2006年。样本公司的年报、中报的财务数据以及市场交易数据均来自国泰安公司的中国股票市场研究数据库(CSMAR)的各个子数据库。

因本文的研究着眼于时间序列上投资者注意力程度的差异，故对盈余实际公告日期数据的精准性要求较高，为此，在盈余实际公告日期的计量上，本文综合了CSMAR以及WIND两个数据库的结果，在确定最终的盈余实际公告日期时，本文的规则如下：1) 当两个数据库的盈余公告日期相同时，那么以任意一个数据库的盈余

公告日期作为最终的盈余实际公告日期；2)当两个数据库的盈余公告日期相差大于5天时，则手工搜集该观测的实际公告日期；3)当两个数据库的盈余公告日期相差小于5天时，则选择公布日期较早的那个数据作为该观测的实际公告日期。

在样本选取中，设定以下标准：一是股票在规定时间内公布其年报/中报，否则加以剔除；二是当年的盈余为正(李远鹏和牛建军，2007)，净资产为正；三是在样本研究期内个股收益率数据齐全。经过筛选和处理，最终我们的有效样本是11,350个观测值。为控制异常值对研究结论的影响，对各变量数据在1%和99%水平上进行了Winsorize处理。

## (二)变量定义

### 1. 投资者注意力的计量

根据上述理论分析，在工作日时，个体的情绪唤醒水平较高，注意的认知资源受到抑制，同时，由于个体在工作日必须处理大量的工作，对于加工证券市场中的盈余信息这项任务所分配的注意力会减少，从而对信息的即时解读能力减弱；在周末时(这里主要指的是周六，因为周日没有盈余公告发布)，个体的机体状态比较放松，情绪唤醒水平较低，意识水平较高，注意的认知资源较为集中，同时由于个体在周末时不用被工作所束缚，从而对市场的注意力程度会增加。因此，本文以不同周历来计量投资者对于证券市场中盈余信息的注意程度，工作日被定义为投资者注意力分散的日子，周末则被定义为投资者注意力集中的日子。

### 2. 盈余总额，现金流量和会计应计

在确定会计应计的大小时，有资产负债表法和现金流量表法两种方法可供选择，Drtina and Largay (1985), Revsine, Collins, and Johnson (1999)以及Hribar and Collins (2002)均指出使用资产负债表的方法来计量会计应计可能会产生比较严重的偏差。近年来大量文献均采用现金流量表的方法来计算会计应计，故本文也沿袭旧制，将会计应计定义为总盈余扣除现金流量后的净额，盈余总额定义为净利润加上财务费用，<sup>3</sup>而现金流量则来自于企业所披露的现金流量表中的经营活动现金流量净额。

绝大部分关于应计异象的文献多沿袭Sloan (1996)的方法，集中于对年度样本的研究。然而，对年度样本的检验存在着一定的局限性：第一，应计项目的存在是为了减少在一定的期间内，现金流量在衡量公司业绩上所存在的较弱的及时性和配比问题(Watts and Zimmerman, 1986; Dechow, 1994; Dechow *et al.*, 1998)。在短区间内，现金流量的及时性和配比性问题表现得更为突出，此时，会计应计能够提供更多价值相关的补充性信息；而从长区间计量时，现金流量和公司业绩的趋同性增强，此时，会计应计所发挥的作用减弱。所以当以更短的区间来计量时，比如从季度的角度来考察，才能够更好地检验投资者对于会计应计的反应和识别能力。第

<sup>3</sup> 由于在计算经营现金流量时不考虑财务费用，用资产负债表法计算应计的时候也会将短期借款等与筹资活动有关的负债去掉，因此，以盈余总额和现金流量计算应计的时候，盈余总额也不应该考虑财务费用。

二，投资者并不只对年度报告做出反应，对于季报和中报，投资者同样会做出反应，事实上，在年度报告中列示的信息已经有部分在中期报告中得到了披露，使用年度样本无法检验出投资者对于中期报告中所提供的信息做出的反应。因此，在从财政年度结束后的第五个月开始，通过累积超额收益率的大小来检验投资者对于盈余中不同组成部分的持续性的识别能力，实际上更大程度上体现的是投资者对于第四季度的盈余信息做出的反应，投资者对于前三个季度披露的盈余信息的定价能力不能得到充分的表现。第三，年报经过独立第三方审计，可靠性增强，投资者对于中期报告和年报所披露的盈余构成成分的定价能力也许存在差异。因此，近年来，部分国外文献开始针对季度的样本进行检验(如Collins and Hribar, 2000; DeFond and Park, 2001; Livnat and Santicchia, 2006; Livnat and Lopez-Espinosa, 2008)，并发现投资者同样无法识别季报中盈余信息的不同组成成分在持续性上的差异，导致了定价偏差。

故本文也采取更短的考察区间来进行计量。考虑到自2002年开始，证监会才要求上市公司公开披露季度报告，如果选取季度报告作为研究样本，会使得样本量较少，并且样本跨度时间较短，不利于衡量外界市场状态的变化对于投资者注意力对定价能力的影响程度的作用，故本文选取1998至2006年中报和年报的数据进行检验。本文采用滚动式的计量方法来定义会计应计和现金流量，该计量方式有助于增强数据的平稳性，减弱企业因操纵盈余而对会计应计的大额计提和转回所产生的影响(Livnat and Lopez-Espinosa, 2008)；另外，采用滚动式计量方法，不仅能够得到对传统的年度数据检验的结果，<sup>4</sup>便于将我们的结果和其他在年度基础上研究应计异象文献的结果相比较，也能够得到对于中期财务报告的检验结果，以便对比年度内的差异。该方法下定义的某个半年度的滚动会计应计/滚动现金流量等于该半年度的会计应计/现金流量和上一个半年度的会计应计/现金流量之和。其中，上半年度的指标主要来自于中报中披露的数据，而下半年度的指标则由年报披露的数据减去中报中披露的上半年的数据得到。另外，为消除规模影响，上述三个指标均采用企业当期的期初期末总资产的平均余额进行标准化处理。本文所涉及的半年度的滚动会计盈余和滚动会计应计/滚动现金流量指标依次定义如下：

$$EARN_t = EARN'_t + EARN'_{t-1}, \quad ACC_t = ACC'_t + ACC'_{t-1}, \quad CFO_t = CFO'_t + CFO'_{t-1}$$

### 3. 超额收益率的计算

关于累计超额收益率的计算方法有如下三种：规模调整后的非正常收益率、风险调整后的非正常收益率以及市场调整后的非正常收益率。在检验应计异象的文章中，绝大部分文献均采用规模调整后的非正常收益率，将所有公司在每一个半年度的最后一个交易日按照公司规模(权益总市值)大小划分为10组，计算每一个规模组合在检验期的平均收益率，然后用个别公司在该期间的原始收益率减去其所属组合的平均收益率，得到规模调整后的收益率。本文亦采用规模调整法来计量超额收益率。

<sup>4</sup> 如 $t$ 年下半年的滚动会计应计等于 $t$ 年上半年的会计应计和 $t$ 年下半年的会计应计之和，也即 $t$ 年度全年的会计应计。因此，对下半年度的检验实质上就相当于对传统的年度样本的检验。

早期文献在构造盈余公告后的累计收益率时,往往选取财政年度结束日后的第五个月起连续12个月的时间作为累计收益率的形成区间,这种窗口的选择方法较为粗糙。Sloan (1996)指出在这12个月区间内所形成的累计超额收益率中,有2/3的部分主要发生在盈余公告期,即接下来四次季度报告的盈余信息发布前后的12天内,<sup>5</sup>因为定价偏差的形成,实质上就是由于投资者无法正确识别当期盈余构成的真实持续性,而产生了滞后反应,故定价偏差将主要集中在后续期间的盈余信息发布之时,即当当期会计应计的低持续性体现为较低的下期实际盈余而呈现在公众面前时。因此,更为准确的计量累计超额收益率的方法是选取从当期盈余构成的信息为公众得知后的第二天至下一期盈余信息宣告当天的这段区间(Livnat and Santicchia, 2006; Livnat and Lopez-Espinosa, 2008),也就是从投资者了解了当期盈余中会计应计和现金流量的各自比例,做出了决策判断之后,至下一期盈余宣告时,投资者真正意识到自己之前高估了会计应计的持续性和低估了现金流量的持续性时止的这段区间。

对于第 $\tau$ 个半年度/年度,个股 $k$ 在时间 $[\tau+h, \tau+H]$ 的累计超额收益率可表示为:

$$RET_{t,k}^{(h,H)} = \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,k}) - 1 \right] - \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,s}) - 1 \right]$$

其中: $R_{j,k}$ 表示个股 $k$ 在第 $j$ 天的实际收益率, $R_{j,s}$ 表示在第 $j$ 天个股所属规模组合的总市值加权平均的市场收益率, $\tau$ 代表个股在第 $\tau$ 个半年度/年度的实际盈余公告日期。本文用中报/年报宣告后的第二个交易日至下一次的年报/中报宣告当天止的这段区间来作为衡量投资者对盈余构成的定价能力的考察期间。<sup>6</sup>

#### 4. 股市周期的识别

在股市周期的识别上,本文采用非参数法诊断我国股市的牛、熊市周期。该方法是在考虑到我国股票市场发展时间短,波动较成熟股市频繁的基础上所提出的,这种通过寻找波峰和波谷来定义股市周期和经济周期的方法也是类似文献广泛采用

<sup>5</sup> 盈余公告期指的是从每次季度盈余公告前两天开始至盈余公告当天止,故每次盈余公告期是三天的时间。

<sup>6</sup> 审稿人指出盈余公告的周历阶段分布是否有持续性可能会对我们的研究结论造成影响。比如本期盈余公告在工作日导致投资者的定价错误更严重,未来的季报和半年报未必在工作日,可能在周末,这样按照本文的逻辑,定价错误会更小。因此,很难从实证上分解真正的注意力效应。Sloan (1996)指出对盈余构成的理解不足而导致的超额回报主要集中于未来的盈余信息公告期内,故我们将未来投资回报的时间窗口截止到下一次的盈余信息公告之时,而不是类似于传统研究应计异象的文献直接选取12个月的时间,因此,投资者对于当期盈余信息的反应不会受到下期盈余信息的干扰。当期盈余信息是在工作日还是周末发布影响到的只是投资者对于当期盈余信息的解读程度,而不会受到下期盈余公告所处周历阶段的影响。也就是说,虽然由于投资者在第 $\tau$ 期注意力不足,对第 $\tau$ 期盈余构成定价出现了偏差而导致的超额回报绝大部分集中于第 $\tau+1$ 期盈余公布时出现(因为投资者只有在将实际盈余和预期盈余进行对比之后,才会导致超额回报的产生),但其产生与否以及数值的大小并不会受到第 $\tau+1$ 期盈余信息是在工作日还是在周末公布的影响。因为投资者对于第 $\tau$ 期盈余构成的定价判断在第 $\tau$ 期盈余信息公布后就已经做出来了,至于第 $\tau+1$ 期盈余信息究竟在哪个周历阶段中公布,影响到的只是投资者对于第 $\tau+1$ 期的盈余信息的解读,而这一影响,也就是第 $\tau+1$ 期盈余信息公布时投资者注意力程度的集中与否对于其定价第 $\tau+1$ 期盈余构成能力的影响的绝大部分要等到第 $\tau+2$ 期的盈余信息公告时,才能反映出来。因此,企业盈余公告的周历阶段分布是否有持续性不会对我们的研究结论造成影响。

的(如Bry and Boschan, 1971; Harding and Pagan, 2002; Edvards *et al.*, 2003; Pagan and Sossounov, 2003; Kaminsky and Schmukler, 2008; 何兴强和周开国, 2006), 该方法能够捕捉到股价在短期内的大涨和大跌, 更适合中国证券市场的实际情况。结合我国实际情况, 我们对Pagan and Sossounov(2003)的牛、熊市判别标准作了适当的调整。股市月度价格水平用 $P_t$ 表示, 对数价格为 $P_t = \ln(P_t)$ 。首先, 我们分别根据以下两个步骤初步识别股票价格的波峰和波谷: 如果 $P_t$ 是一个宽度为3个月的价格窗口中的最大值, 即 $P_{t-3}, \dots, P_{t-1} < P_t > P_{t+1}, \dots, P_{t+3}$ , 则时刻 $t$ 对应一个波峰; 如果 $P_t$ 是一个宽度为3个月的价格窗口中的最小值, 即 $P_{t-3}, \dots, P_{t-1} > P_t < P_{t+1}, \dots, P_{t+3}$ , 则时刻 $t$ 对应一个波谷。

为了不遗漏股价较短时期内大幅涨跌对应的大牛、大熊, 以及排除虚假牛、熊市周期, 本文还要求诊断到的牛、熊市周期满足: (1) 如果牛市和熊市的单程时长不超过4个月, 则股市价格逆转前后价格的升跌幅必须超过20%; (2) 不包括距离序列端点不足4个月的波峰和波谷; (3) 不包括序列端点附近股价水平低于端点处股价的波峰、以及股价水平高于端点处股价的波谷; (4) 不包括周期全程长度小于6个月的牛、熊市周期。另外, 为了保证波峰和波谷交替出现, 我们消去连续波峰中价格较低者和连续波谷中的价格较高者。<sup>7</sup> 最后得到的自1998年1月1日至2006年12月31日以来的股市周期分布如表1。

表1 牛、熊市的分布(1998.1.1-2006.12.31)

牛市	熊市
1998.01-1998.06	1998.07-1999.02
1999.03-2001.06	2001.07-2002.01
2002.02-2002.07	2002.08-2002.12
2003.01-2003.04	2003.05-2003.11
2003.12-2004.03	2004.04-2005.07
2005.08-2006.12	

在控制变量的选择上, 除了使用宣告年份和月份这两个基本的虚拟变量, 以控制时间序列上外部监管环境的不同对结果可能产生的影响以外, 结合相关文献的做法以及本研究数据的一些基本特征, 我们使用的其他几个控制变量包括: 公司规模( $LnMV$ ), 账面市值比( $B/M$ ), 盈余市价比( $E/P$ ), 当期收益率( $R$ ), 当期期末股价( $PRICE$ )和当期换手率( $VOL$ )。公司规模、账面市值比和盈余市价比在一定程度上反映了公司潜在的风险及其增长潜力, 这些指标会对随后的超额收益产生影响, 投资者对于盈余信息的反应也可能会受到这三个因素的影响, 故需要控制(Sloan, 1996; Collins, Gong, and Hribar, 2003; DellaVigna and Pollet, 2009; Jin, 2009); 当期的累计收益率大小代表了后续可能产生的价格动量(Price Momentum), 需要控制(Collins, Gong, and Hribar, 2003; Ali and Gurun, 2009; Barone and Magilke, 2009); 当期期末的股价和当期的换手率在一定程度上代表了套利限制, 需要控制(Mashruwala,

<sup>7</sup> 参见何兴强和周开国, “牛、熊市周期和股市间的周期协同性”, 《管理世界》, 2006年第4期, 35-40。

Rajgopal, and Shevlin, 2006; Barone and Magilke, 2009)；同时，当期的换手率也从一定程度上反映了公司当期所受到的投资者的关注程度及其股票的流动性 (Hou, Peng, and Xiong, 2008)，需要加以控制。结合以往研究应计异象的文献的结果，预期控制变量  $B/M$ 、 $E/P$ 、 $R$  三个指标的回归系数为正， $LnMV$  和  $VOL$  的回归系数为负，而对于控制变量  $PRICE$  的回归系数，以往的结论不是太一致，故暂时无法给出预测。

本文所涉及到的变量定义见表 2。

表 2 变量定义汇总表

变量标识	变量名称	变量定义
<b>因变量</b>		
$RET$	累计超额收益率	规模调整后的日超额收益率的累计值
$RET\_BETA$	累计超额收益率	风险调整后的日超额收益率的累计值
$RET\_MKT$	累计超额收益率	市场调整后的日超额收益率的累计值
<b>自变量</b>		
$ASSET$	平均总资产	期初和期末总资产的平均值
$EARN$	盈余总额	(净利润+财务费用)/平均总资产
$CFO$	现金流量	经营活动产生的现金流量净额/平均总资产
$ACC$	会计应计	(盈余总额-现金流量)/平均总资产
$R\_CFO$	现金流量层级	按照现金流量大小进行排序，并分成十等份
$R\_ACC$	会计应计层级	按照会计应计大小进行排序，并分成十等份
$WEEK$	不同的周历阶段	盈余实际公告日期处于工作日取 1，周末取 0
$BULL$	不同的市场状态	盈余实际公告日期处于牛市取 1，熊市取 0
$INS$	机构持股比例	最近一期的全部机构投资者持股比例
$FUN$	基金持股比例	最近一期的基金持股比例
$SEC$	券商持股比例	最近一期的券商持股比例
$OTH$	其他机构持股比例	最近一期的其他机构投资者持股比例
$NUMO$	同时公告数目	当日同时发布盈余公告的公司数目
$NUM$	同时公告数目层级	按当日同时公告盈余数目排序，并分成十等份
<b>控制变量</b>		
$LnMV$	公司规模	$t$ 半年度末时权益市值的自然对数
$B/M$	账面市值比	上市公司 $t$ 半年度末时所有者权益账面市值比
$E/P$	盈余市价比	$t$ 半年度每股收益和每股市价的比值
$R$	当期收益率	$t$ 半年度的股票累计收益率
$PRICE$	股价	$t$ 半年度末时的每股股价
$VOL$	换手率	$t$ 半年度的个股总交易股数/总流通股数
$YEAR$	公告年度	上市公司盈余实际公告日期所处的年度
$MONTH$	公告月份	上市公司盈余实际公告日期所处的月份



本文所涉及到的模型如下：

为检验假说一，本文采用的是Sloan(1996)以及随后大多数文献所应用的Mishkin(1983)的理性定价模型。针对会计应计和现金流量的联立方程为：

$$EARN_{t+1} = \alpha_0 + \alpha_1 \times ACC_t + \alpha_2 \times CFO_t + v_{t+1} \quad (1-1)$$

$$RET_{t+1} = \beta (EARN_{t+1} - \alpha_0 - \alpha_1 \times ACC_t + \alpha_2 \times CFO_t) + \varepsilon_{t+1} \quad (1-2)$$

其中， $EARN_{t+1}$ 是第 $t+1$ 期的会计盈余， $ACC_t$ 是第 $t$ 期的会计应计， $CFO_t$ 是第 $t$ 期的现金流量， $RET_{t+1}$ 为公司股票在当期盈余公告后至下期盈余公告时的这段区间内规模调整后的超额收益率。通过模型(1-1)可以分别观察到会计应计和现金流量持续能力的估计值，通过模型(1-2)可以得到市场对会计应计和现金流量的定价系数，以检验投资者是否功能锁定于会计盈余总额，是否能正确理解会计盈余不同组成部分的持续性对未来会计盈余的预测能力。

为检验假说二和假说三，即考察投资者注意力差异对于会计应计定价偏差的影响作用，使用如下模型：

$$RET_{t+1} = \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times LnMV_t + \alpha_5 \times B/M_t + \alpha_6 \times E/P_t + \alpha_7 \times R_t + \alpha_8 \times PRICE_t + \alpha_9 \times VOL_t + \varepsilon_{t+1} \quad (2)$$

其中， $RET_{t+1}$ 为公司股票在当期盈余公告后至下期盈余公告时的这段区间内的规模调整后的超额收益率， $R\_ACC_t$ 是第 $t$ 期的会计应计所处层级， $WEEK$ 代表当期盈余公告所处的周历阶段，处于工作日取1，处于周末则取0，其余为控制变量。系数 $\alpha_2$ 反映了在周末宣告的样本中，投资者对会计应计定价偏差的程度；系数 $\alpha_2 + \alpha_3$ 衡量了在工作日宣告的样本中，投资者对会计应计定价偏差的程度；交叉项的系数 $\alpha_3$ 则反映了投资者注意力差异对于会计应计定价偏差的影响。

## 五、实证结果分析

### (一) 描述性统计

考虑到投资者对盈余信息的注意力程度的分布特征，本文以周末代表投资者注意力集中的日子，工作日代表投资者注意力分散的日子，并将样本按会计应计的大小分为五组，<sup>8</sup>用 $Q\_ACC$ 表示， $Q\_ACC$ 等于1为会计应计最低组，等于5为会计应计最高组。表3针对周末和工作日公布盈余的两个子样本，给出了关键变量的描述性

<sup>8</sup> 在描述性统计中，我们采用了五分位的分法，而在实证分析部分，我们采用了十分位的分法。主要是考虑到，尽管十分位的细分方法更有助于显示出不同组别间的差异，但同时会导致每一组样本中的数量较少，不同组别间的公司规模、账面市值比等差异更大，从而会对收益率造成影响，然而我们在描述性统计中却无法控制这些因素，从而使得估计的波动性增加(Collins and Hribar, 2000)；而采用五分位的方法增加了每组中的样本数量，从而能够增强估计的稳定性和精确性，增加检验的解释能力(DellaVigna and Poller, 2009)。这一做法和类似文献也是一致的，如Collins and Hribar(2000)以及Mashruwala, Rajgopal, and Shevlin(2006)。另外，我们同样也采用了十分位的方法，结果类似。

统计结果。<sup>9</sup> 两组样本在规模、账面市值比等指标上存在一定的差异，因此我们在后续检验中控制了这些因素。从时间序列来看，两组样本的盈余均成下降趋势。从盈余构成来看，会计应计在盈余总额中的比重小于现金流量。周末宣告的公司，其盈余总额和现金流量均小于在工作日宣告的公司，且差异显著；其会计应计大于在工作日宣告的公司，但差异不显著。

**表3** 主要变量的描述性统计

	$LnMV_t$	$B/M_t$	$E/P_t$	$R_t$	$PRICE_t$	$VOL_t$
工作日	7.74	0.38	0.04	-0.04	10.06	0.49
周末	7.61	0.42	0.04	-0.06	9.01	0.50
差异	0.13***	-0.04***	0.00**	0.02***	1.05***	-0.01
T值	6.86	-6.43	2.43	3.35	7.49	-1.14

**表3** 主要变量的描述性统计(续)

	$EARN_t$	$ACC_t$	$CFO_t$	$EARN_{t+1}$	$RET_{t+1}$	N
工作日	0.0574	0.0007	0.0571	0.0431	-0.0079	9087
周末	0.0483	0.0037	0.0452	0.0330	-0.0166	2263
差异	0.0091***	-0.0030	0.0119***	0.0101***	0.0087*	
T值	11.40	-1.58	5.92	8.57	1.83	

注：\*表示在10%的水平下显著，\*\*表示在5%的水平下显著，\*\*\*表示在1%的水平下显著。

表4给出了工作日宣告和周末宣告公司在每一个会计应计层级组中的分布，包括在每一个五分位组中，两组样本公司的会计应计大小的均值、频数分布及各自所占的比重。

**表4** 每一个会计应计层级中工作日和周末宣告公司的会计应计大小及频数分布

	$Q\_ACC$	1 (BOTTOM)	2	3	4	5 (TOP)
全部	均值	-0.1041	-0.0344	-0.0015	0.0315	0.1148
	N	2264	2271	2276	2271	2268
工作日	均值	-0.1031	-0.0339	-0.0008	0.0321	0.1152
	N	1864	1831	1804	1822	1766
	比重	0.82	0.81	0.79	0.80	0.78
周末	均值	-0.1087	-0.0366	-0.0042	0.0290	0.1134
	N	400	440	472	449	502
	比重	0.18	0.19	0.21	0.20	0.22

<sup>9</sup> 审稿人指出，我们假设盈余是否在周末公布是外生性的，但何时公布盈余是个策略性问题，因此，周六公布盈余的企业与其他企业可能存在着不同的特性。表3也确实揭示了这类企业与其他企业存在着不同的地方，但亦可能存在其他未考虑的因素，这导致结果是否受外生性影响的疑惑。我们认为，外生性问题确实是类似研究中普遍存在的，均无法避免地会遇到。如DellaVigna and Poller(2009)发现在周五和非周五公布盈余信息的公司，在公司特征，如规模和账面市值比上存在着一定的差异；Hirshleifer, Lim, and Teoh(2009)发现在多信息日和少信息披露信息的公司，其特征上也存在着一定的差异。他们对于这一问题的解决方法均是在回归方程中加入这些代表公司特征差异的控制变量以减弱外生性的影响。由于他们的研究思路和我们类似，因此，我们也效仿他们的解决办法，在表3描述性统计的基础之上选取一些控制变量加入到回归方程中，以期最大限度地排除外生性的影响。

由表4可以看出, 盈余公告的周历分布是均衡的, 即两组公司在每一个层级组中的频数分布相当, 也进一步说明了这两组公司之间没有系统性差异。同时, 在每个层级组中, 两组公司各自的会计应计大小的均值也是非常接近的, 无明显差异, 说明投资者对于工作日宣告和周末宣告所做出的不同反应并非由于两组公司本身在会计应计大小上存在差异所导致。

在研究定价偏差的经济后果时, 一般按照会计应计大小把样本分组做投资组合分析, 一个对冲的交易策略包含购买低会计应计的公司股票, 卖空高会计应计的公司股票, 两者未来一定期间内超额收益的差额即为对冲投资策略的超额投资收益。如对冲投资策略的超额收益显著异于零, 则可以推断投资者在评估会计应计的持续性时有偏差, 造成错误的股票价值判断, 即市场非效率。表5-1报告了整个样本区间内, 会计应计的大小和累计超额收益率之间的关系, 其中, Panel A、Panel B和Panel C依次给出的是全部样本、工作日宣告样本和周末宣告样本的检验结果, Panel D给出了对于同一个层级的会计应计大小, 工作日宣告样本和周末宣告样本在累计超额收益率上的差异, 即投资者不同的注意力程度与其对会计应计定价能力的关系。每个子样本中  $Q\_ACC5$  和  $Q\_ACCI$  的累计超额收益的差值代表了对冲投资策略的超额收益, 负向的差异暗示着投资者无法识别会计应计的低持续性, 负向的差异越大代表定价偏差程度越高。由表5-1 Panel A可以发现, 随会计应计大小的增加, 盈余公告后的累计超额收益率严格地单调递减, 说明投资者高估了会计应计的持续性, 而导致了定价偏差。这一现象同样存在于在工作日宣告盈余的子样本中, 然而在周末宣告盈余的子样本中并不存在, 表现为Panel B中  $Q\_ACC5$  和  $Q\_ACCI$  的累计超额收益的差值显著异于0, 而Panel C中该差值并不显著异于0。假说一、二得到了初步验证。

表5-1 不同会计应计层级下累计超额收益率的对比——全样本区间

$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	全样本	工作日	周末	差异
1 (BOTTOM)	0.0037	0.0077	-0.0151	0.0228** (2.32)
2	0.0020	0.0049	-0.0101	0.0151* (1.71)
3	-0.0080	-0.0048	-0.0205	0.0157 (1.53)
4	-0.0175	-0.0178	-0.0163	-0.0015 (-0.14)
5 (TOP)	-0.0285	-0.0308	-0.0203	-0.0105 (-1.00)
$Q\_ACC5 -$	-0.0321***	-0.0385***	-0.0051	
$Q\_ACCI$	(-5.35)	(-5.68)	(-0.39)	

注: 括号内为T值, \*表示在10%的水平显著, \*\*表示在5%的水平显著, \*\*\*表示在1%的水平显著(下同)。

表5-2和表5-3分别报告了在牛、熊市阶段中, 投资者注意力对会计应计定价偏差影响的差异。由Panel B和Panel C的结果可以看出, 不管在何种市场状态, 工作日宣告盈余的样本中始终存在对会计应计的定价偏差, 而周末宣告盈余的样本中始终不存在定价偏差。由于市场状态本身会对超额收益的大小产生不同的影响, 因此,

我们着重将表5-2和表5-3中的Panel D的结果进行对比，即投资者注意力在周历阶段下的差异对解读效率的影响在牛、熊市阶段中的不同表现，可以发现：在牛市阶段，在五个会计应计层级组中，投资者注意力差异对于会计应计定价的影响在四个层级下都显著；而在熊市阶段，投资者注意力对定价能力的影响减弱，表现为，在五个会计应计层级组中，该影响均不显著，并且即使在会计应计的极端层级组中，该差异也均不显著。Panel D的结果说明在牛市阶段，投资者注意力对定价能力的影响更强，初步验证了假说三。

**表5-2** 不同会计应计层级下累计超额收益率的对比——牛市阶段

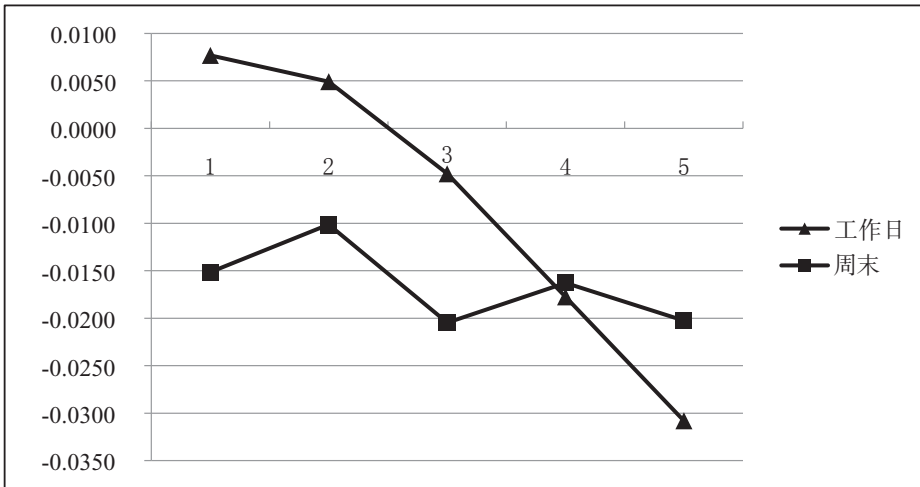
$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	全样本	工作日	周末	差异
1 (BOTTOM)	0.0025	0.0073	-0.0198	0.0272** (1.95)
2	0.0021	0.0059	-0.0135	0.0194* (1.74)
3	-0.0070	-0.0029	-0.0231	0.0202** (2.04)
4	-0.0140	-0.0131	-0.0181	0.0050 (0.30)
5 (TOP)	-0.0310	-0.0361	-0.0128	-0.0233** (-1.96)
$Q\_ACC5 -$	-0.0336***	-0.0434***	0.0071	
$Q\_ACCI$	(-3.82)	(-4.43)	(0.36)	

**表5-3** 不同会计应计层级下累计超额收益率的对比——熊市阶段

$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	全样本	工作日	周末	差异
1 (BOTTOM)	0.0052	0.0082	-0.0088	0.0170 (1.15)
2	0.0018	0.0037	-0.0056	0.0093 (0.68)
3	-0.0094	-0.0072	-0.0172	0.0100 (0.76)
4	-0.0219	-0.0240	-0.0143	-0.0097 (-0.78)
5 (TOP)	-0.0252	-0.0240	-0.0292	0.0052 (0.40)
$Q\_ACC5 -$	-0.0304***	-0.0322***	-0.0204	
$Q\_ACCI$	(-3.89)	(-3.60)	(-1.27)	

图1则以表5-1为例，更直观地对比了投资者对于工作日和周末公告在反应上的差异，即投资者注意力对于盈余构成定价的影响。可以看出，对于工作日公告样本，盈余公告后的超额收益和会计应计之间表现出了很强的线性关系，随着会计应计大小的增加，超额收益严格地单调递减，说明投资者对于工作日公告的盈余信息解读不完全，出现了定价偏差；而对于周末公告的样本，其超额收益和会计应计之间不存在明显的线性关系，并且走势变化较为平缓，因此可以认为，投资者对于周末公告的盈余构成信息能够进行正确的解读。

图1 投资者注意力对于定价偏差的影响



(二) 实证检验结果及分析

本文首先使用Fama-MacBeth (1973) 分年度回归再汇总的方法，采用模型(1-1)和(1-2)分别对工作日宣告样本和周末宣告样本进行检验，按照以往的研究，会计应计的持续性低于现金流量，在模型中表现为 $\alpha_1 < \alpha_2$ ，应计异象的核心内容是会计应计和现金流量的定价系数没有显著差异，具体到模型中的参数，即 $\alpha_1^* = \alpha_2^*$ 。为考察市场是否出现显著的定价偏差，我们需要检验的是 $\alpha_1 = \alpha_1^*$ 和 $\alpha_2 = \alpha_2^*$ 。表6-1、6-2和6-3依次给出了全样本、上半年度样本和下半年度样本的检验结果。

表6-1 投资者注意力差异对盈余构成定价的影响——全部样本

Panel A 工作日宣告样本的Fama-MacBeth 检验			Panel B 周末宣告样本的Fama-MacBeth检验		
参数	估计值	T值	参数	估计值	T值
$\alpha_1$	0.7008***	12.14	$\alpha_1$	0.7357***	12.65
$\alpha_1^*$	0.7349***	3.67	$\alpha_1^*$	0.5198*	1.79
$\alpha_2$	0.7649***	13.38	$\alpha_2$	0.7839***	13.13
$\alpha_2^*$	0.6807***	3.80	$\alpha_2^*$	0.5556*	1.86
$\beta$	1.7009***	7.31	$\beta$	1.3423***	4.28
Test: $\alpha_1 = \alpha_2$ 11.28*** <sup>10</sup>			Test: $\alpha_1 = \alpha_2$ 3.21**		
Test: $\alpha_1 = \alpha_1^*$ 7.80***			Test: $\alpha_1 = \alpha_1^*$ 1.87		
Test: $\alpha_2 = \alpha_2^*$ 10.10***			Test: $\alpha_2 = \alpha_2^*$ 1.93		

<sup>10</sup> 这里分别给出的是似然率检验的 $\chi^2$ 统计量及其显著性。

表 6-2 投资者注意力差异对盈余构成定价的影响——上半年度样本

Panel A 工作日宣告样本的 Fama-MacBeth 检验			Panel B 周末宣告样本的 Fama-MacBeth 检验		
参数	估计值	T 值	参数	估计值	T 值
$\alpha_1$	0.6073***	6.56	$\alpha_1$	0.6806***	7.24
$\alpha_1^*$	0.6412**	3.69	$\alpha_1^*$	0.4782*	1.87
$\alpha_2$	0.6720***	7.16	$\alpha_2$	0.7171***	8.46
$\alpha_2^*$	0.5940***	4.66	$\alpha_2^*$	0.5111*	1.92
$\beta$	1.4841***	6.77	$\beta$	1.2348**	2.91
Test: $\alpha_1 = \alpha_2$ 12.73***			Test: $\alpha_1 = \alpha_2$ 2.75*		
Test: $\alpha_1 = \alpha_1^*$ 7.99***			Test: $\alpha_1 = \alpha_1^*$ 1.70		
Test: $\alpha_2 = \alpha_2^*$ 11.49***			Test: $\alpha_2 = \alpha_2^*$ 1.85		

表 6-3 投资者注意力差异对盈余构成定价的影响——下半年度样本

Panel A 工作日宣告样本的 Fama-MacBeth 检验			Panel B 周末宣告样本的 Fama-MacBeth 检验		
参数	估计值	T 值	参数	估计值	T 值
$\alpha_1$	0.7827***	12.34	$\alpha_1$	0.7840***	10.72
$\alpha_1^*$	0.8169**	3.22	$\alpha_1^*$	0.5563*	1.84
$\alpha_2$	0.8462***	14.05	$\alpha_2$	0.8424***	10.12
$\alpha_2^*$	0.7567**	3.32	$\alpha_2^*$	0.5946*	1.93
$\beta$	1.8907***	4.37	$\beta$	1.4364***	5.17
Test: $\alpha_1 = \alpha_2$ 10.00***			Test: $\alpha_1 = \alpha_2$ 3.70**		
Test: $\alpha_1 = \alpha_1^*$ 7.63***			Test: $\alpha_1 = \alpha_1^*$ 1.96		
Test: $\alpha_2 = \alpha_2^*$ 8.89***			Test: $\alpha_2 = \alpha_2^*$ 1.98		

由表 6-1 可以看出,对于工作日宣告盈余信息的子样本,会计应计的持续性系数为 0.7008,而市场的定价系数为 0.7349,意味着会计应计被高估,并且差异在 1% 的水平显著;现金流量的持续性系数为 0.7649,而市场定价系数为 0.6807,意味着现金流量被低估,该差异同样在 1% 水平显著。同时,市场给予会计应计的估价系数 0.7349 大于对现金流量的估价系数 0.6807,说明投资者在定价时没有意识到会计应计的实际持续性低于现金流量的持续性,而做出了错误的判断,因此,对盈余构成的定价偏差现象在工作日宣告盈余信息的子样本中是显著存在的。对于周末宣告盈余信息的子样本,现金流量的持续性系数 0.7839 高于会计应计的持续性系数 0.7357,且差异显著,从市场的角度看,投资者给予现金流量的估价系数 0.5556 高于对会计应计的估价系数 0.5198,说明市场在定价时考虑到了会计应计和现金流量

在持续性上的差异，对盈余的不同组成成分做出了有区别的定价。然而此时，市场对现金流量和会计应计的估价系数均低于其持续性系数，可能是由于投资者在对周末盈余进行定价时过分保守所导致，但该差异在统计上均是不显著的，即Mishkin检验无法拒绝原假设 $\alpha_1 = \alpha_1^*$ 和 $\alpha_2 = \alpha_2^*$ ，故对于周末宣告盈余信息的子样本，不能拒绝市场中不存在对盈余构成定价偏差的原假设。假说一得到了验证。另外，投资者对于会计应计的估价上，估价系数由工作日的0.7349下降到周末的0.5198，变化幅度为29%；对于现金流量的估价上，估价系数由工作日的0.6807下降到周末的0.5556，变化幅度为18%。可见，在对盈余构成进行定价时，投资者注意力分配差异对于会计应计定价的影响程度要大于对现金流量定价的影响程度。相对于现金流量来说，解读会计应计是一项更复杂的任务，因此，投资者在解读会计应计时会需要更多的认知资源，注意力对会计应计定价的影响程度更高。

表6-2和表6-3的检验结果同表6-1类似，说明在我国证券市场中，应计异象不仅在年度报告中是存在的，在中期报告中同样也是存在的，同时，工作日宣告样本中存在显著的盈余构成定价偏差，而周末宣告样本中不存在明显的定价偏差，投资者注意力对于中报和年报的解读效率均会产生影响。

考虑到可能存在其他因素对投资者注意力和估价产生影响，接下来本文以应计会计为例，进行多元回归来检验投资者有差异的注意力程度对盈余构成定价偏差的影响。我们将全部样本按照会计应计的大小依次从小到大进行排序，并分为十组，以 $R\_ACC$ 表示。我们混合了样本期间的横截面数据以及时间序列数据进行检验，即所谓的面板数据 (Panel Data)。采用面板数据进行回归分析，能够有效地提高时间序列模型估计的准确性，并且对自相关和异方差有较好的校正。本研究样本数据Hausman检验的结果全部支持使用固定效应模型。

本文首先对投资者对会计应计定价偏差的基本现象进行了检验，表7报告了相关结果。当加入控制变量后，整个回归方程的显著性和拟合度均得到了较大程度的提高，说明了我们选取的这些控制变量均是合理的。可以看出，不管是对于中报样本还是年报样本，市场中均存在着对于会计应计的定价偏差，即投资者无法识别出会计应计的低持续性，当期会计应计较高的公司之后的累计超额收益率较低，而当期会计应计较低的公司之后的累计超额收益率较高。同时，控制变量的回归系数的符号也均和预期相符。

表8报告了在全部样本、中报样本以及年报样本中，投资者注意力对会计应计定价偏差的影响程度。可以发现，在周末宣告盈余信息的样本中，由于投资者投入了更多的注意力和认知资源，能够对盈余信息进行正确解读，不存在对会计应计的定价偏差，表现为代表会计应计和盈余公告后累计超额收益关系( $R\_ACC$ )的系数不显著。而在工作日宣告盈余信息的样本中，由于投资者注意力分散，对信息的解读能力下降，无法正确对盈余总额的不同组成部分进行识别，导致了定价偏

差，表现为代表会计应计和盈余公告后累计超额收益关系 ( $R\_ACC$ ) 的系数和交叉项 ( $WEEK*R\_ACC$ ) 的系数之和显著异于 0。交叉项 ( $WEEK*R\_ACC$ ) 的系数则衡量了投资者对盈余信息投入的注意力程度对其解读信息能力的影响，交叉项系数显著为负，说明随着投资者注意力分散程度的增加，定价偏差越严重。假说二得到了验证。

表7 会计应计和定价偏差

因变量: $RET$	Panel Data Regression					
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	全样本	上半年度	下半年度	全样本	上半年度	下半年度
Constant	-0.0049 (-0.69)	-0.0047 (-0.60)	-0.0046 (-0.60)	-0.0254 (-1.06)	-0.0172 (-0.50)	-0.0293 (-0.92)
$R\_ACC$	<b>-0.0378***</b> (-6.37)	<b>-0.0369***</b> (-4.14)	<b>-0.0385***</b> (-4.84)	<b>-0.0314***</b> (-5.23)	<b>-0.0303***</b> (-3.39)	<b>-0.0313***</b> (-3.89)
$LnMV$				-0.0031 (-1.07)	-0.0074* (-1.75)	0.0007 (0.20)
$B/M$				0.0400*** (3.33)	0.0209 (1.16)	0.0558*** (3.47)
$E/P$				0.4430*** (5.24)	1.0788*** (8.76)	-0.0615 (-0.53)
$R$				0.0819*** (7.26)	0.0607*** (3.83)	0.1066*** (6.70)
$PRICE$				-0.0008 (-1.58)	0.0007 (0.99)	-0.0020*** (-3.05)
$VOL$				-0.0247*** (-4.18)	-0.0300*** (-3.40)	-0.0232*** (-2.91)
$YEAR$	X	X	X	X	X	X
$MONTH$	X	X	X	X	X	X
N	11350	4771	6579	11350	4771	6579
Adj.R <sup>2</sup> (%)	0.65	0.46	0.74	1.65	2.73	1.71
F	2.36***	0.81	3.64***	5.20***	3.65***	6.33***



表8 投资者注意力差异对会计应计定价偏差的影响

因变量: <i>RET</i>	Panel Data Regression					
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	全样本	上半年度	下半年度	全样本	上半年度	下半年度
Constant	-0.0276*** (-2.72)	-0.0321** (-2.35)	-0.0242** (-1.99)	-0.0438* (-1.77)	-0.0371 (-1.04)	-0.0460 (-1.40)
<i>WEEK</i>	0.0282*** (3.13)	0.0334** (2.43)	0.0245** (2.07)	0.0252*** (2.81)	0.0278** (2.02)	0.0226** (1.91)
<i>R_ACC</i>	<b>-0.0066</b> (-0.49)	<b>-0.0020</b> (-0.09)	<b>-0.0094</b> (-0.54)	<b>-0.0023</b> (-0.17)	<b>0.0023</b> (0.11)	<b>-0.0046</b> (-0.26)
<i>WEEK*R_ACC</i>	<b>-0.0387***</b> (-2.60)	<b>-0.0423*</b> (-1.84)	<b>-0.0365*</b> (-1.87)	<b>-0.0362**</b> (-2.45)	<b>-0.0398*</b> (-1.75)	<b>-0.0337*</b> (-1.73)
<i>LnMV</i>				-0.0033 (-1.16)	-0.0078* (-1.83)	0.0006 (0.15)
<i>B/M</i>				0.0405*** (3.37)	0.0218 (1.21)	0.0560*** (3.48)
<i>E/P</i>				0.4359*** (5.15)	1.0702*** (8.67)	-0.0668 (-0.58)
<i>R</i>				0.0816*** (7.23)	0.0606*** (3.83)	0.1060*** (6.67)
<i>PRICE</i>				-0.0008 (-1.58)	0.0006 (0.97)	-0.0020*** (-3.04)
<i>VOL</i>				-0.0246*** (-4.15)	-0.0298*** (-3.37)	-0.0231*** (-2.90)
<i>YEAR</i>	X	X	X	X	X	X
<i>MONTH</i>	X	X	X	X	X	X
N	11350	4771	6579	11350	4771	6579
Adj. R <sup>2</sup> (%)	0.73	0.59	0.80	1.72	2.82	1.77
F	2.39***	0.76	3.69***	5.21***	3.66***	6.32***
$\alpha_2 + \alpha_3 = 0$	46.35***	20.08***	26.32***	32.92***	14.28***	17.88***

表9报告了在全部样本、中报样本以及年报样本中,投资者注意力对于会计应计导致的定价偏差程度的影响在不同市场状态下的表现。对于周末宣告盈余信息的公司,不管是在牛市阶段还是在熊市阶段,均不存在对会计应计的定价偏差,表现为代表会计应计和盈余公告后累计超额收益关系(*R\_ACC*)的系数均不显著。然而在牛市阶段,该系数为正,即高*ACC*导致高回报,我们认为,这和市场所处的状态有关,牛市下市场狂热,投资者情绪高涨,不同股票的价格一涨俱涨,市场整体的收益率都比较高,这就导致了对于会计应计较高的公司,市场给予的定价也相对较高,但因为统计意义上并不显著,说明对于周末发布的盈余信息,即使在牛市阶段下,也并不存在明显的对会计应计的错误定价。对于工作日宣告盈余信息的公司,

不管是在牛市阶段还是在熊市阶段，均存在着对会计应计的定价偏差，表现为代表会计应计和盈余公告后累计超额收益关系( $R\_ACC$ )的系数和交叉项( $WEEK*R\_ACC$ )的系数之和均显著为负。然而，投资者注意力差异对定价偏差的影响仅仅体现在牛市阶段，即在牛市阶段，交叉项( $WEEK*R\_ACC$ )的系数显著为负，而在熊市阶段，该差异不显著，说明在整个样本区间内体现出来的投资者注意力对于定价偏差程度的影响主要是受到了牛市阶段的驱动。假说三得到了验证。

**表9** 不同市场状态下投资者注意力差异对会计应计定价偏差的影响——Panel Data

因变量： $RET$	全样本		上半年度样本		下半年度样本	
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	牛市阶段	熊市阶段	牛市阶段	熊市阶段	牛市阶段	熊市阶段
Constant	-0.0346 (-0.95)	-0.0076 (-0.24)	0.0173 (0.21)	-0.0393 (-1.02)	-0.0599 (-1.47)	0.0378 (0.74)
$WEEK$	0.0356*** (2.70)	0.0138 (1.21)	0.0776** (2.22)	0.0117 (0.85)	0.0255* (1.82)	0.0164 (0.80)
$R\_ACC$	<b>0.0122</b> <b>(0.62)</b>	<b>-0.0162</b> <b>(-0.97)</b>	<b>0.0764</b> <b>(1.45)</b>	<b>-0.0191</b> <b>(-0.94)</b>	<b>-0.0011</b> <b>(-0.05)</b>	<b>-0.0129</b> <b>(-0.45)</b>
$WEEK*R\_ACC$	<b>-0.0520**</b> <b>(-2.38)</b>	<b>-0.0191</b> <b>(-1.03)</b>	<b>-0.1276**</b> <b>(-2.19)</b>	<b>-0.0121</b> <b>(-0.54)</b>	<b>-0.0352*</b> <b>(-1.71)</b>	<b>-0.0327</b> <b>(-0.99)</b>
$LnMV$	-0.0010 (-0.24)	-0.0072** (-2.00)	-0.0162* (-1.66)	-0.0061 (-1.37)	0.0038 (0.81)	-0.0104 (-1.64)
$B/M$	0.0305* (1.76)	0.0608*** (3.84)	-0.0095 (-0.27)	0.0461** (2.17)	0.0504** (2.50)	0.0774*** (3.21)
$E/P$	0.0961 (0.80)	0.9225*** (8.16)	0.6530*** (2.78)	1.4312*** (9.73)	-0.1941 (-1.35)	0.2396 (1.35)
$R$	0.0792*** (5.10)	0.0918*** (5.72)	0.0109 (0.35)	0.1013*** (5.42)	0.1090*** (5.97)	0.0708** (2.15)
$PRICE$	-0.0018*** (-2.73)	0.0010 (1.61)	0.0014 (0.88)	0.0008 (1.20)	-0.0027*** (-3.57)	0.0027* (1.72)
$VOL$	-0.0262*** (-3.06)	-0.0257*** (-3.32)	-0.0463** (-2.46)	-0.0253*** (-2.63)	-0.0208** (-2.15)	-0.0278** (-2.12)
$YEAR$	X	X	X	X	X	X
$MONTH$	X	X	X	X	X	X
N	6427	4923	1281	3490	5146	1433
Adj. $R^2$ (%)	1.47	3.88	2.21	4.88	1.77	3.81
F	3.63***	2.13**	2.39*	2.65**	5.37***	3.45**
$\alpha_2 + \alpha_3 = 0$	16.26***	17.26***	4.13**	9.96***	11.68***	7.71***

## 六、敏感性分析

### (一) 改变累计超额收益率的计算方法

为验证本文的结果是否会受到超额收益率计算方法的影响，接下来本文分别采用市场调整法和风险调整法来计算累计超额收益率。

市场调整方法下定义的超额收益率等于某只股票在某个时期的实际收益率减去相应时期的市场组合的收益率。对于第 $t$ 个半年度/年度，个股 $k$ 在时间 $[t+h, t+H]$ 的经市场调整后的累计超额收益率可表示为：

$$RET\_MKT_{t,k}^{(h,H)} = \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,k}) - 1 \right] - \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,m}) - 1 \right]$$

其中： $R_{j,k}$ 表示个股 $k$ 在第 $j$ 天的实际收益率， $R_{j,m}$ 表示在第 $j$ 天两市A股的流通市值加权平均的市场收益率， $\tau$ 代表个股在第 $t$ 个半年度/年度的实际盈余公告日期。

风险调整法下定义的超额收益率等于某只股票在某个时期的实际收益率减去相应时期的风险（贝塔系数）调整后的收益率。在个股贝塔的确上，个股 $k$ 在第 $t$ 个半年度/年度时的贝塔值主要根据盈余宣告前 $[-300, -46]$ <sup>11</sup>天内的个股收益率对市场收益率回归得到：

$$R_{u,k} = \alpha_{t,k} + \beta_{t,k} \times R_{u,m}$$

其中： $R_{u,k}$ 表示个股 $k$ 在第 $u$ 天的股票收益率， $R_{u,m}$ 表示在第 $u$ 天两市A股流通市值加权平均市场收益率， $\tau$ 代表个股在第 $t$ 个半年度/年度的实际盈余公告日， $u$ 代表在盈余宣告日 $\tau$ 之前 $[-300, -46]$ 的区间。

对于第 $t$ 个半年度/年度，个股 $k$ 在时间 $[t+h, t+H]$ 的经风险调整后的累计超额收益率为：

$$RET\_BETA_{t,k}^{(h,H)} = \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,k}) - 1 \right] - \beta_{t,k} \times \left[ \prod_{j=\tau+h}^{\tau+H} (1+R_{j,m}) - 1 \right]$$

其中： $R_{j,k}$ 表示个股 $k$ 在第 $j$ 天的实际收益率， $R_{j,m}$ 表示在第 $j$ 天两市A股的流通市值加权平均的市场收益率， $\beta_{t,k}$ 代表个股的贝塔系数， $\tau$ 代表个股在第 $t$ 个半年度/年度的实际盈余公告日期。

表10报告了当分别采用市场调整法和风险调整法计算累计超额收益率时，投资者不同注意力程度对会计应计定价偏差的影响。对于周末宣告盈余信息的公司，不管采用哪种方式计量超额收益率，不管是在牛市阶段、熊市阶段，还是全样本期间，投资者对其会计应计均没有表现出定价偏差，即代表会计应计和盈余公告后累计超额收益关系( $R\_ACC$ )的系数均不显著；而对于工作日宣告盈余信息的公司，在不同的计量方法和计量区间内，定价偏差均显著存在，即代表会计应计和盈余公告后累计超额收益关系( $R\_ACC$ )的系数和交叉项( $WEEK * R\_ACC$ )的系数之和均显著异于0。另外，反映投资者注意力差异对定价偏差影响程度的交叉项( $WEEK * R\_$

<sup>11</sup> 这一区间的确定主要参照 DellaVigna and Pollet (2009) 的做法。

$ACC$ ) 系数在牛市阶段显著异于 0, 而在熊市阶段不显著, 说明投资者注意力差异对于定价偏差程度的影响主要体现在牛市阶段。因此, 本文的主要发现不会受到超额收益率计算方法的影响。

**表 10** 投资者注意力差异对会计应计定价偏差的影响——Panel Data

因变量: $RET$	市场调整法			风险调整法		
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	全样本	牛市阶段	熊市阶段	全样本	牛市阶段	熊市阶段
Constant	0.0552** (2.20)	0.2078*** (5.68)	-0.1105*** (-3.40)	0.0261 (1.02)	0.1633*** (4.34)	-0.1060*** (-3.19)
$WEEK$	0.0286*** (3.14)	0.0417*** (3.16)	0.0131 (1.13)	0.0291*** (3.13)	0.0423*** (3.12)	0.0140 (1.19)
$R\_ACC$	<b>0.0001</b> <b>(0.01)</b>	<b>0.0156</b> <b>(0.79)</b>	<b>-0.0146</b> <b>(-0.87)</b>	<b>0.0016</b> <b>(0.11)</b>	<b>0.0153</b> <b>(0.76)</b>	<b>-0.0121</b> <b>(-0.71)</b>
$WEEK*R\_ACC$	<b>-0.0430***</b> <b>(-2.88)</b>	<b>-0.0602***</b> <b>(-2.74)</b>	<b>-0.0212</b> <b>(-1.13)</b>	<b>-0.0450***</b> <b>(-2.94)</b>	<b>-0.0618***</b> <b>(-2.74)</b>	<b>-0.0241</b> <b>(-1.25)</b>
$LnMV$	-0.0049* (-1.70)	-0.0235*** (-5.51)	0.0184*** (5.07)	-0.0050* (-1.71)	-0.0193*** (-4.40)	0.0128*** (3.46)
$B/M$	0.0499*** (4.10)	0.0451*** (2.61)	0.0629*** (3.92)	0.0485*** (3.90)	0.0307* (1.72)	0.0770*** (4.71)
$E/P$	0.4082*** (4.77)	0.0611 (0.51)	0.8871*** (7.76)	0.4235*** (4.84)	0.1508 (1.21)	0.7970*** (6.84)
$R$	0.1040*** (9.13)	0.1045*** (6.71)	0.0989*** (6.09)	0.1143*** (9.81)	0.1288*** (8.04)	0.0896*** (5.41)
$PRICE$	-0.0011** (-2.34)	-0.0022*** (-3.29)	0.0010 (1.53)	-0.0012** (-2.53)	-0.0027*** (-3.88)	0.0011* (1.69)
$VOL$	-0.0134** (-2.23)	-0.0133 (-1.55)	-0.0262*** (-3.35)	-0.0167*** (-2.73)	-0.0299*** (-3.39)	-0.0085 (-1.06)
$YEAR$	X	X	X	X	X	X
$MONTH$	X	X	X	X	X	X
N	11350	6427	4923	11350	6427	4923
Adj. $R^2$ (%)	4.12	3.96	7.07	3.34	3.46	5.08
F	15.14***	7.65***	8.62***	12.24***	8.71***	6.09***
$\alpha_2 + \alpha_3 = 0$	40.06***	20.32***	17.37***	39.16***	20.83***	17.03***

## (二) 不同类别投资者在注意力程度上的差异

机构投资者<sup>12</sup>具有比较强的研发力量、信息优势和资金优势，相对于个人投资者在掌握和使用公开信息方面具有专业优势，受到更为系统的训练，同时，由于机构投资者的本职工作就是对企业发布的盈余公告信息进行分析 and 解读，因此，预期注意力对于不同类别投资者在决策过程中产生的影响程度会有所差异。

由于WIND中可获得的机构持股数据始于2004年，因此，我们从RESSET(锐思)数据库中另行提取了2001至2003年之间的机构持股数据。Ryan and Schneider(2002)及Chen, Harford, and Li(2007)指出，不同机构投资者的“股东积极主义”程度不同，只有与上市公司之间业务独立、持股期在一年以上、重仓持股的这一类机构会对公司产生监督作用，并在重要决策上对公司施加影响，而其他类别机构投资者不具有监督作用。姚颐和刘志远(2009)发现，与券商相比，由于基金在运作机制上更加市场化，激励约束机制更高，独立性更强，使得基金的监督作用要远远高于券商，基金的行为更加具有理性特征。可见，不同类别的机构投资者对公司的关注度和监督作用不同。考虑到基金大约占了所有机构投资者总规模的80%以上，是机构投资者最主要的组成部分，<sup>13</sup>并且，基金的持股比例明显高于券商，<sup>14</sup>所以，我们也遵循上述思路，除了对于全部机构投资者的检验外，又将全部机构投资者分为基金、券商及其他机构投资者三类，分别进行检验，目的是分析当机构重仓持股时，是否会更加关注所投资的公司，从而周历阶段下的注意力差异对信息解读的影响程度减弱。

我们依次采用如下模型来检验不同类别投资者在决策时受到注意力影响的程度：

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK_t + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times INS_t \\
 & + \alpha_5 \times INS_t \times R\_ACC_t + \alpha_6 \times INS_t \times WEEK \times R\_ACC_t + \alpha_7 \times LnMV_t \\
 & + \alpha_8 \times B/M_t + \alpha_9 \times E/P_t + \alpha_{10} \times R_t + \alpha_{11} \times PRICE_t + \alpha_{12} \times VOL_t + \varepsilon_{t+1} \quad (3)
 \end{aligned}$$

其中，对于基金、券商和其他机构投资者的检验，我们将变量INS分别以FUN、SEC和OTH代替。

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK_t + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t \\
 & + \alpha_4 \times FUN_t + \alpha_5 \times FUN_t \times R\_ACC_t + \alpha_6 \times FUN_t \times WEEK \times R\_ACC_t \\
 & + \alpha_7 \times SEC_t + \alpha_8 \times SEC_t \times R\_ACC_t + \alpha_9 \times SEC_t \times WEEK \times R\_ACC_t \\
 & + \alpha_{10} \times OTH_t + \alpha_{11} \times OTH_t \times R\_ACC_t + \alpha_{12} \times OTH_t \times WEEK \times R\_ACC_t \\
 & + \alpha_{13} \times LnMV_t + \alpha_{14} \times B/M_t + \alpha_{15} \times E/P_t + \alpha_{16} \times R_t + \alpha_{17} \times PRICE_t \\
 & + \alpha_{18} \times VOL_t + \varepsilon_{t+1} \quad (4)
 \end{aligned}$$

<sup>12</sup> 我们这里指的是广义的机构投资者，包括基金、券商、保险公司、社保基金以及信托公司等全部机构投资者。

<sup>13</sup> 参见候宇和叶冬艳，“机构投资者、知情人交易和市场效率”，《金融研究》，2008年第4期，131-145。

<sup>14</sup> 参见姚颐和刘志远，“机构投资者具有监督作用吗”，《金融研究》，2009年第6期，128-143。

对于模型(3), 系数  $\alpha_3$  衡量了个人投资者对于工作日和周末公告的盈余信息在解读能力上的差异, 即个人投资者在对盈余构成进行定价时受到注意力的影响程度; 系数  $(\alpha_3 + \alpha_6)$  衡量了机构投资者对于工作日和周末公告的盈余信息在解读能力上的差异, 即机构投资者在对盈余构成进行定价时受到注意力的影响程度; 系数  $\alpha_6$  则衡量了机构和个人在对盈余构成进行定价时受到注意力影响程度的差异。对于模型(4),  $\alpha_6$ 、 $\alpha_9$  和  $\alpha_{12}$  依次衡量了与个人投资者相比, 基金、券商以及其他机构投资者在对盈余构成进行定价时受到注意力影响程度的差异。预期随着机构投资者持股比例的增加, 周历阶段下注意力的分配差异对于投资者在决策过程中产生的影响程度会减弱, 即系数  $\alpha_6$ 、 $\alpha_9$  和  $\alpha_{12}$  应该显著为正。具体检验结果如表 11 所示。

**表 11** 投资者注意力差异对会计应计定价偏差的影响——机构投资者对比个人投资者

因变量: <i>RET</i>	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	全样本	全部	基金	券商	其他	全样本
Constant	-0.0417 (-1.61)	-0.0399 (-1.52)	-0.0019 (-0.07)	-0.0451* (-1.71)	-0.0398 (-1.52)	-0.0065 (-0.24)
<i>WEEK</i>	0.0214** (2.20)	0.0214** (2.20)	0.0211** (2.17)	0.0209** (2.14)	0.0216** (2.23)	0.0210** (2.16)
<i>R_ACC</i>	-0.0104 (-0.73)	0.0123 (0.65)	0.0146 (1.29)	0.0037 (0.19)	0.0030 (0.17)	0.0215 (1.35)
<b><i>WEEK*R_ACC</i></b>	<b>-0.0301**</b> <b>(-1.98)</b>	<b>-0.0382**</b> <b>(-1.97)</b>	<b>-0.0521***</b> <b>(-2.64)</b>	<b>-0.0396**</b> <b>(-1.95)</b>	<b>-0.0362**</b> <b>(-1.91)</b>	<b>-0.0562**</b> <b>(-2.42)</b>
<i>INS</i>		0.0401*** (3.73)				
<i>INS*R_ACC</i>		-0.0436* (-1.67)				
<b><i>INS*WEEK*R_ACC</i></b>		<b>0.0168</b> <b>(0.70)</b>				
<i>FUN</i>			0.0616*** (5.35)			0.0552*** (4.43)
<i>FUN*R_ACC</i>			-0.0712*** (-2.58)			-0.0688** (-2.30)
<b><i>FUN*WEEK*R_ACC</i></b>			<b>0.0478**</b> <b>(1.96)</b>			<b>0.0481*</b> <b>(1.88)</b>
<i>SEC</i>				0.0151 (1.24)		0.0066 (0.54)
<i>SEC*R_ACC</i>				-0.0305 (-1.04)		-0.0161 (-0.54)

因变量: <i>RET</i>	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
自变量	全样本	全部	基金	券商	其他	全样本
<i>SEC*WEEK*R_ACC</i>				<b>0.0218</b>		<b>0.0134</b>
				<b>(0.81)</b>		<b>(0.49)</b>
<i>OTH</i>					0.0315***	0.0142
					(2.97)	(1.24)
<i>OTH*R_ACC</i>					-0.0256	0.0001
					(-1.03)	(0.00)
<i>OTH*WEEK*R_ACC</i>					<b>0.0124</b>	<b>-0.0052</b>
					<b>(0.54)</b>	<b>(-0.21)</b>
<i>LnMV</i>	-0.0051*	-0.0081***	-0.0127***	-0.0055*	-0.0076**	-0.0133***
	(-1.69)	(-2.62)	(-3.95)	(-1.80)	(-2.46)	(-4.09)
<i>B/M</i>	0.0478***	0.0495***	0.0413***	0.0481***	0.0486***	0.0427***
	(3.93)	(4.08)	(3.40)	(3.96)	(4.01)	(3.50)
<i>E/P</i>	0.4409***	0.4152***	0.3507***	0.4366***	0.4183***	0.3466***
	(5.20)	(4.89)	(4.10)	(5.15)	(4.93)	(4.05)
<i>R</i>	0.0975***	0.0952***	0.0910***	0.0973***	0.0951***	0.0905***
	(7.06)	(6.90)	(6.59)	(7.05)	(6.89)	(6.55)
<i>PRICE</i>	0.0007	0.0005	0.0000	0.0007	0.0007	0.0001
	(1.23)	(0.82)	(0.04)	(1.15)	(1.15)	(0.09)
<i>VOL</i>	-0.0236***	-0.0228***	-0.0265***	-0.0238***	-0.0226***	-0.0257***
	(-3.55)	(-3.44)	(-3.98)	(-3.58)	(-3.41)	(-3.86)
<i>YEAR</i>	X	X	X	X	X	X
<i>MONTH</i>	X	X	X	X	X	X
N	8941	8941	8941	8941	8941	8941
Adj. R <sup>2</sup> (%)	2.03	2.25	2.58	2.06	2.22	2.63
F	7.00***	7.34***	7.28***	6.90***	7.21***	7.34***
$\alpha_3 + \alpha_6 = 0$		1.08	0.04	0.68	1.37	

当剔除缺失机构投资者持股数据的观测后,最终的样本量减少到了8941个。我们首先以这个样本对本文的主要发现进行了再检验,如Panel A所示,可见,全样本区间内,与周末宣告的盈余信息相比,投资者对于工作日宣告的盈余信息的定价偏差更大,表现为Panel A中系数 $\alpha_3$ 显著为负,假说二再次得到了验证。Panel B、Panel C、Panel D和Panel E依次列示了,个人投资者和全部机构投资者、基金、券商以及其他机构投资者在信息解读时受到注意力影响程度的差异,可以发现,不管何种类别的机构投资者,注意力在周历阶段下的分配对其信息解读效率无显著影响,表现为系数 $(\alpha_3 + \alpha_6)$ 均不显著;同时,机构投资者在决策时受到注意力分配差异的影响程度减弱,表现为Panel B、Panel C、Panel D和Panel E中系数 $\alpha_6$ 为正,但只有基金和个人投资者之间的差异显著,即系数 $\alpha_6$ 仅在Panel C的检验中显著,说明随着

基金持股比例的增加，可以显著削弱注意力差异对于信息解读的影响，Panel F的检验也同样支持了这个发现。然而尽管基金等机构投资者在决策时受到注意力的影响程度减弱，但由于我国证券市场主要由散户构成，机构持股总市值较小，<sup>15</sup>因此，市场中总体表现出来的行为特征仍然是由中小投资者所驱动的，即整体依然会表现出注意力显著影响信息解读效率这个现象。另外，我们注意到，在Panel B和Panel C中系数 $\alpha_5$ 显著为负，说明基金等机构投资者有更明显的从众行为和羊群效应，尽管其在决策过程中受到注意力的影响程度减弱，但同样会出现定价偏差，程度上甚至可能高于个人投资者，这和以往的发现也是一致的（如Shiller and Pound, 1989; Scharfstein and Stein, 1990; Banerjee, 1992; Bikhchandani, Hirshleifer, and Welch, 1992; Froot *et al.*, 1992）。总的来说，表11的检验说明了，机构投资者在信息解读过程中不会受到注意力的显著影响，同时，机构投资者对其所投资公司的注意力程度会受到其持股份额的影响，当机构投资者持有相当数量的股份时，会更加有动力去关注公司的盈余信息，会主动去搜集相关信息来辅助决策，从而显著削弱注意力对于决策判断的影响作用。

### (三)控制当日同时宣告盈余的公司数目

我国证券市场中，盈余报告集中披露的现象较为突出。Hirshleifer, Lim, and Teoh (2009)以及于李胜和王艳艳(2010)均指出当日同时公告盈余信息的数目会对投资者的信息解读能力产生显著的影响，信息竞争性披露虽然降低了投资者对公司层面信息的处理能力，却能够为投资者提供更多市场和板块层面的信息(Peng and Xiong, 2006)，在中国证券市场中，股价同步性较高，同涨同跌现象严重，市场和板块层面的信息在市场定价中起主导作用，所以信息竞争性披露的增加会增强投资者的市场反应，提高信息解读效率。因此，我们所发现的投资者对于不同周历阶段公布的盈余信息在解读能力上的差异，究竟是由于投资者的注意力在不同周历阶段下的分配差异所致，还是由于不同周历阶段下同时公告盈余信息的数目不同所致？即应计异象的周历效应究竟是一种独立的现象，还是竞争性信息数量多少的另外一种表现形式？接下来，本文控制了当日同时公告盈余的数目，采用模型(5)对本文主要结果重新进行了检验，并在表12中报告了相关结果。

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times NUM_t \\
 & + \alpha_5 \times NUM_t \times R\_ACC_t + \alpha_6 \times NUM_t \times WEEK \times R\_ACC_t + \alpha_7 \times LnMV_t \\
 & + \alpha_8 \times B/M_t + \alpha_9 \times E/P_t + \alpha_{10} \times R_t + \alpha_{11} \times PRICE_t + \alpha_{12} \times VOL_t + \varepsilon_{t+1} \quad (5)
 \end{aligned}$$

<sup>15</sup> 我们对机构投资者持股总市值占A股市场总流通市值的比例进行了统计，2001年为1.64%，2002年为3.82%，2003年为4.80%，2004年为7.72%，2005年为10.61%，2006年为13.93%，在本文1998-2006这段样本区间内，机构持股平均总份额较小。



表 12 投资者注意力差异对会计应计定价偏差的影响——控制当日同时宣告盈余数目

因变量： <i>RET</i>	Panel A	Panel B	Panel C	Panel D
自变量	全样本	全样本	全样本	全样本
Constant	-0.0110 (-0.93)	-0.0111 (-0.94)	-0.0295 (-1.16)	-0.0299 (-1.17)
<i>WEEK</i>	0.0258*** (2.85)	0.0261*** (2.88)	0.0232** (2.57)	0.0235*** (2.60)
<i>R_ACC</i>	<b>-0.0259</b> (-1.52)	<b>-0.0127</b> (-0.63)	<b>-0.0214</b> (-1.26)	<b>-0.0070</b> (-0.35)
<i>WEEK*R_ACC</i>	<b>-0.0357**</b> (-2.39)	<b>-0.0522**</b> (-2.57)	<b>-0.0333**</b> (-2.24)	<b>-0.0513**</b> (-2.54)
<i>NUM</i>	-0.0306*** (-2.74)	-0.0308*** (-2.76)	-0.0262** (-2.35)	-0.0264** (-2.37)
<i>NUM*R_ACC</i>	<b>0.0351*</b> (1.87)	<b>0.0127</b> (0.48)	<b>0.0345*</b> (1.85)	<b>0.0100</b> (0.38)
<i>NUM*WEEK*R_ACC</i>		<b>0.0292</b> (1.20)		<b>0.0319</b> (1.32)
<i>LnMV</i>			-0.0033 (-1.14)	-0.0032 (-1.13)
<i>B/M</i>			0.0416*** (3.45)	0.0415*** (3.45)
<i>E/P</i>			0.4193*** (4.91)	0.4195*** (4.92)
<i>R</i>			0.0810*** (7.18)	0.0812*** (7.20)
<i>PRICE</i>			-0.0008* (-1.67)	-0.0008* (-1.67)
<i>VOL</i>			-0.0244*** (-4.12)	-0.0244* (-4.13)
<i>YEAR</i>	X	X	X	X
<i>MONTH</i>	X	X	X	X
N	11350	11350	11350	11350
Adj. R <sup>2</sup> (%)	0.80	0.82	1.77	1.79
F	2.38***	2.36***	5.21***	5.17***

如Panel A和Panel C所示，当我们将代表注意力分配差异的周历阶段和代表信息处理难度的竞争性信息数量多少这两个变量同时纳入模型后，代表周历阶段和会计应计大小的交叉项(*WEEK\*R\_ACC*)的系数依然显著为负，说明控制了当日同时宣告数量后，与工作日相比，投资者对于周末发布的盈余信息依然会表现出更强的解读效率；代表竞争性信息数量和会计应计大小的交叉项(*NUM\*R\_ACC*)的系数显著为

正，这也是符合我们预期的，即同时公告信息数目的增加能够增强投资者对于市场和板块层面信息的解读效率，有助于降低投资者信息处理难度，从而减少了对盈余构成的定价偏差。这部分检验说明公告所处周历阶段和竞争性信息数量多少都会对信息解读产生影响，两种机制同时在发挥作用。Panel B和Panel D的检验同样提供了额外的证据，当我们引入三重交叉项( $NUM*WEEK*R\_ACC$ )以检验这两种机制的交互影响时，代表竞争性信息数目和会计应计大小的交叉项( $NUM*R\_ACC$ )的系数不显著了，而代表周历阶段和会计应计大小的交叉项( $WEEK*R\_ACC$ )的系数依然显著为负，并且三重交叉项( $NUM*WEEK*R\_ACC$ )不显著，说明竞争性信息数量的多少对于公告周历对信息解读的影响无显著作用。总的来说，我们关于竞争性信息数量的检验证实了，我们所提出的注意力在周历阶段下的分配差异对投资者信息解读效率的影响是独立于信息竞争性披露数量的影响而存在的，注意力的周历效应和信息竞争性披露的数量对于投资者信息解读的影响是由于不同的驱动机制所导致的，是两种独立的现象。

#### (四) 投资者注意力对定价偏差影响的稳定性

本文采用Fama-MacBeth (1973)的方法，进一步检验了投资者注意力在周历阶段下的差异对其定价能力影响的稳定性，分析了这一影响在不同时间段的变化特征。首先对各个半年度中投资者注意力对信息解读效率的影响程度予以检验，再将所有样本区间内的回归结果汇总，计算系数均值，判断系数和截距项是否显著异于0，从而验证该影响是否具有稳定性。表13报告了检验结果，可以发现这一影响在全样本区间内是稳定而持续的，同时，在牛市阶段下，由于投资者情绪高涨，对后市较为乐观，在决策时投入的认知努力较少，放大了注意力差异对决策行为的影响，进一步印证了假说二和假说三。

#### (五) 其他一些敏感性检验

为减少潜在的计量偏差和极端值的影响，我们仿照相关文献的做法(如Pincus, Rajgopal, and Venkatachalam, 2007; Zhang, 2007; DellaVigna and Pollet, 2009; Gong, Li, and Xie, 2009)，对未来股价回报做了统计上的缩尾处理，然而这种处理可能会导致结果有偏，因为相当于利用了未来的信息，因此，我们使用原始的数值(即未经极值化处理前)对本文的主要发现进行了再检验，主要结论没有改变。在对盈余总额的计量上，部分文献用的是营业利润(如Sloan, 1996; Chan *et al.*, 2001; Fairfield *et al.*, 2003)，部分文献用的是净利润(如Subramanyam, 1996; Collins and Hribar, 2000; Xie, 2001; Barone and Magilke, 2009)，在对比了这些文献的结论后，我们发现不管采用哪种方式计量，对文章的总体结论影响不大。考虑到有些公司缺失营业利润的数据，因此我们采用净利润来定义盈余的大小。为验证我们的结果不会受到盈余计量方式的影响，我们采用营业利润计量盈余对本文的主要发现进行了再检验，主要结论没有改变。研究目的的需要使我们要利用更精确的窗口区间来衡量未来股票回报，因此我们当前在计量未来股票回报时是从盈余公告后第二个交易日开始计算的，但有的企业此时尚未公布盈余，投资者无法得知市场上所有企业的盈余及其构成的情况，因而会导致“后见之明偏差”。尽管目前关于盈余公告后漂移现象和应计异象的研究中，绝大部分文献都存在这个问题(如Collins and Hribar, 2000; Ke and Ramalingegowda, 2005; DellaVigna and Pollet, 2009; Hirshleifer, Lim, and Teoh, 2009; 孔东民和柯瑞豪, 2007)，但出于稳健性的考虑，我们用上一期会计应计的大小对

当期的样本公司进行排序来构建投资组合做了敏感性检验，以消除后见之明偏差的影响，在避免了这种偏差之后本文的主要结论依然没有改变。为验证本文结果的稳健性，我们又选用了另外一种定义牛熊市区间的方法对本文的主要发现进行了再检验。我们按照上证综指的走势，将1998年1月至2001年6月和2005年8月至2006年12月定义为牛市阶段，该区间内中国A股市场处于长期上涨阶段；2001年7月至2005年7月定义为熊市阶段，该区间内中国A股市场处于长期下跌阶段。该划分结果与其他文献也是吻合的（如陆蓉和徐龙炳，2004；鹿长余，2007；吴世农，2007；乔润海，2008；林树和李翔，2009）。实证结果显示，本文的主要结论并不会受到牛熊市划分方法的影响。此外，我们还采用了季报样本对本文的发现进行了再检验，主要结论依然没有改变。<sup>16</sup>

表 13 投资者注意力差异对会计应计定价偏差的影响

因变量： <i>RET</i>	Panel A	Panel B	Panel C	Panel D
自变量	全样本	全样本	牛市阶段	熊市阶段
Constant	0.2555* (1.81)	0.2216 (1.57)	0.2661 (1.36)	0.0641 (0.28)
<i>WEEK</i>		0.2085* (1.86)	0.2240* (1.91)	0.2543 (1.31)
<i>R_ACC</i>	<b>-0.1923*** (-3.09)</b>	<b>-0.0141 (-0.65)</b>	<b>0.0747 (0.79)</b>	<b>-0.0992 (-0.71)</b>
<i>WEEK*R_ACC</i>		<b>-0.2217** (-2.23)</b>	<b>-0.3185** (-2.13)</b>	<b>-0.1170 (-1.04)</b>
<i>LnMV</i>	-0.0788 (-1.53)	-0.0805 (-1.52)	-0.0534 (-1.30)	-0.0665** (-2.32)
<i>B/M</i>	0.2206** (2.13)	0.2256** (2.15)	0.1443* (1.75)	0.2733*** (3.93)
<i>E/P</i>	0.5857*** (3.98)	0.5737*** (3.96)	0.3045 (1.41)	1.0782*** (6.34)
<i>R</i>	0.4342*** (5.47)	0.4274*** (5.45)	0.4429*** (5.24)	0.2603*** (5.10)
<i>PRICE</i>	0.0008 (0.00)	0.0057 (0.02)	-0.0925** (-2.27)	0.1251 (1.32)
<i>VOL</i>	-0.2672*** (-3.29)	-0.2620*** (-3.28)	-0.2271*** (-3.90)	-0.0637*** (-3.26)
<i>YEAR</i>	X	X	X	X
<i>MONTH</i>	X	X	X	X
N	11350	11350	6427	4923
Adj. R <sup>2</sup> (%)	5.56	5.76	5.80	9.52
F	6.33***	6.37***	4.91***	5.76***
$\alpha_2 + \alpha_3 = 0$		30.33***	14.98**	15.90***

<sup>16</sup> 感谢匿名审稿人和本刊的执行编辑吴东辉博士为我们提出了关于上述敏感性检验的建议。

## 七、结论

投资者对信息的解读能力反映了信息在资本市场的传播效率,是衡量资本市场有效性的重要指标之一。本文结合认知心理学和行为金融学领域的相关发现,首次以投资者在不同时间序列上有差异的注意力程度作为切入点,研究了投资者注意力对应计异象的影响作用。我们的结果表明,当投资者对盈余信息解读所分配的注意力程度更高时,投资者的认知需要增加,会尽可能搜集相关信息来实现对盈余的正确解读,不存在应计异象;而当投资者处于有限注意的状态时,在解读信息时所能够投入的认知资源减少,认知动机减弱,定价偏差程度增加,导致了应计异象的产生。随着基金等机构投资者持股比例的增加,投资者注意力对于信息解读能力的影响作用减弱,说明发展以基金为首的机构投资者有助于投资者信息解读效率的提高,增强资源配置的有效性。另外,由于投资者情绪和心态在股市周期的不同阶段中存在明显的差异,导致投资者注意力对于信息解读能力的影响作用有所不同,在牛市阶段,该影响作用会得到进一步地强化。本文的研究将行为学、认知心理学和行为金融学等多学科领域的相关发现较好地进行了贯穿和整合,对于理解我国资本市场上的信息披露及信息传导机制具有指导意义,有助于研究者更深入地理解投资者的行为及其价格的形成等基本问题,能够帮助投资者正确定价、提高资本市场配置资源的效率,并且能够为决策者在制定相关政策以优化信息披露制度、提高投资者对盈余信息的解读效率和增强市场效率等方面提供指引作用。同时,本文的发现也暗示了我们以周历阶段作为投资者注意力表征变量的合理性和有效性,从而可以应用和推广到后续关于投资者注意力的研究中去。

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## Investor Attention and the Accrual Anomaly

Xiaohan Li and Ming Zhang\*

### Abstract

Drawing on the research on attention allocation in cognitive psychology, we study the influence on pricing errors of earnings components (accruals and cash flow) of different allocations of investor attention on different days in a weekly cycle. Our findings show that when investors are distracted, their cognitive resources are restrained, and they have lower ability to read earnings information, resulting in pricing errors of earnings components and the accrual anomaly. But when investors focus their attention, they enhance their cognitive motivation, read earnings information more thoroughly, and correctly price earnings components without the accrual anomaly. Also, as a fund's shareholding proportion increases, investor attention has a weakening influence on information reading, showing that institutional investors led by funds contribute to improving the information reading efficiency of investors and strengthen the effectiveness of resource allocation. Moreover, investors have different moods and mentalities in different market conditions, and thereby are influenced in respect of attention allocation and cognitive needs. The influence of investor attention allocation on pricing errors is also demonstrated primarily in a bull market.

**Keywords:** Investor Attention, Pricing Error, Accrual Anomaly, Cognitive Needs, Market Status

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\* Xiaohan Li is a postdoctoral researcher at the Postdoctoral Research Station of China Financial Futures Exchange. E-mail: lxhan2009@gmail.com. Ming Zhang is a professor at the Research Institute of Accounting and Finance at Shanghai University of Finance and Economics. The authors would like to thank two anonymous reviewers and Dr Donghui Wu, Executive Editor of this publication, for their valuable opinions and suggestions, as well as Professor Canlin Li from the Board of Governors of the Federal Reserve System, and Professor Hongjun Zhu from the Research Institute of Accounting and Finance of Shanghai University of Finance and Economics, for their help. The authors take sole responsibility for their views.

## I. Introduction

Accounting earnings reflect a company's business performance in the current period, and are one of the most important pieces of information to which investors attach first importance in capital markets. Any intrinsic characteristics of this information may lead investors to make errors in their responses (pricing behaviour). At the same time, earnings persistence is an important indicator of earnings quality that investors can use to predict an enterprise's future yearly earnings and evaluate the intrinsic value of a stock for making investment decisions. According to the accrual-based accounting method, accounting earnings are composed of cash flow from operating activities (hereinafter "cash flow") and accruals. Earnings persistence depends on the relative proportions of the two. Accruals are established to mitigate the weak timeliness and matching problem of cash flow when measuring company performance (Watts and Zimmerman, 1986; Dechow, 1994; Dechow *et al.*, 1998), and to provide more supplementary information relevant to value. But this feature of accruals also affects its reliability to some degree. Because accruals provide more room for choosing accounting policies that require higher levels of the subjective judgment of accountants, errors of estimation are more likely to occur. Meanwhile, companies are more likely to manage accruals than cash flow, leading to a lower persistence of the former than the latter. When pricing stocks in line with accounting earnings information, investors should reasonably consider the difference in persistence between cash flow and accruals; Sloan (1996), however, finds that investors cannot tell the difference and so overestimate the persistence of accruals while underestimating that of cash flow. Because companies with higher or lower accruals will be more likely to post negative or positive abnormal returns when investors make pricing errors in earnings components, constructing an arbitrage strategy based on accounting accruals could achieve an abnormal return of 10 per cent in a year.

Obviously, the accrual anomaly does not conform to investor rationality or the non-arbitrage theory, further challenging the efficient-market hypothesis. Articles by Sloan (1996) have aroused intense attention in academia and investment circles. Investors are obsessed with market anomalies because they provide a potential opportunity to enhance portfolio yields, while researchers are obsessed with them because they provide an opportunity to challenge existing theories. Studying anomalies could thus introduce some new theories of market pricing or investor behaviour or new research methods (Zach, 2003).

One widely accepted reason for the formation of the accrual anomaly is that, according to behavioural finance, insufficient attention by investors results in reading earnings information incompletely. Investors need time and cost to process information, but they also have bounded rationality and limited attention such that they are unable to correctly and fully understand earnings information, resulting in pricing errors. Moreover, a large gap remains between the Chinese securities markets and developed markets in terms of institutional background, levels of market development, and investor rationality.

Movements in the Chinese markets are clearly affected by government policies; individual investors blindly follow momentum strategies and speculate in stocks such that the markets are prone to volatility, while factors of market non-efficiency widely exist in the capital market. These factors thus play a key role in forming the accrual anomaly when that of the Chinese security markets is examined.

Because levels of attention differ between individuals, we test the time-series variations of investor attention and their influence on pricing capacity with respect to earnings components from the perspectives of the theories of cognitive psychology; we further test the variation trends of these influences at different stages of the stock market cycle when considering the status of the external market. We find that when investors concentrate their attention, they are better able to read information and correctly judge the persistence of accruals and cash flow without making any pricing errors in earnings components or the accrual anomaly. But when investors are distracted, they are not able to timely or correctly read information, resulting in pricing errors and the accrual anomaly. Since institutional investors, such as funds, increase their shareholding ratios, the influence of attention on information reading will weaken. Moreover, investors will change their attention allocation and cognitive needs between a bull and a bear market; compared with a bear market, investor attention will have a greater influence on the pricing errors of earnings components in a bull market.

The main contribution of this paper is to incorporate behavioural finance into the study of accounting accruals in order to examine dynamically the influence of investor attention on pricing errors of earnings components—that is, how the devoted attention of investors influences their ability to read information. Scholars have always paid close attention to the pricing role that information plays in the capital market, and this issue is particularly important in an emerging and transforming market like China's. Prior research primarily studies whether information disclosure and information quality can facilitate the pricing of capital markets from the perspective of information production, whereas little research examines how investor attention influences the transmission efficiency of information in the capital market. This paper attempts to meet such a deficiency. Our study could help researchers further understand basic issues such as market efficiency and price formation, help investors correctly price stocks, and improve the efficiency of resource allocation in the capital market. Meanwhile, its findings provide new evidence for the formation of the accrual anomaly on the basis of market inefficiency.

The rest of this paper is arranged as follows: Section II contains the literature review, Section III explains the theory analysis and hypotheses development, Section IV mainly describes sample selection and defines variables, Section V presents the empirical tests and results analysis, Section VI provides the sensitivity analysis, and Section VII concludes.

## II. Literature Review

### 2.1 Pricing Errors Incurred by Accrual-Based Accounting

Accrual-based accounting transfers or adjusts the confirmation time of cash flows and tries to strike a balance between relevance and reliability; a higher level of relevance, however, is to be obtained at the expense of reliability. Barth *et al.* (2001) point out that accrual accounting turns current earnings and current cash flow into biased estimators of future cash flow. Accounting estimations involved in the process of accrual accounting result in transitory earnings; also, estimation errors are more likely to arise in accrual than in cash-based accounting. Errors of accounting estimation are demonstrated mainly in accruals and have the characteristic of a mean reversion (Watts, 1993; Dechow, 1994), which causes a lower persistence of accruals than of cash flow in respect of earnings components.

Sloan (1996) finds that investors are unable to correctly recognise information in accounting earnings and are inclined to overestimate accruals and underestimate cash flow, resulting in mispricing of stocks. Although the existence of the accrual anomaly is widely accepted (Xie, 2001; LaFond, 2005; Pincus, Rajgopal, and Venkatachalam, 2007), there is no consistent conclusion about its formation. According to research, there are two reasons why the accrual anomaly forms. First, research on the hypothesis of an efficient capital market holds that the accrual anomaly is nothing but a demonstration of risk premium. For example, some scholars consider the accrual anomaly to exist only because the systematic risk factors of listed companies have not been fully controlled for in the research design, and thus a regular return is wrongly regarded as an abnormal return (Fama, 1970; Khan, 2005). Companies with different accruals may have different financial risks, resulting in the so-called accrual anomaly (Zach, 2003; Dechow and Ge, 2005). The four factors of risk used by Khan (2005), however, have no solid theoretical foundation and lack empirical support. Second, interpretation of the accrual anomaly is based on market inefficiency, holding that the existence of the anomaly proves investor mispricing and the lack of market efficiency. Such research can be classified into two categories in line with the manipulative behaviour of management. One is that this manipulative behaviour leads to a low persistence of accruals, which influences pricing by investors (Xie, 2001; Beneish and Vargus, 2002; Zach, 2003; Kothari *et al.*, 2006). For this category, a low persistence of accruals results either from a low persistence of growth or from management forecast errors, instead of from earnings manipulation by management (Collins, Gong, and Hribar, 2003; Richardson *et al.*, 2005). Research on the formation of the accrual anomaly on the basis of market inefficiency holds that investors make systematic errors when understanding the value relevance of accruals because of the existence of information cost, and that investors' functional fixation results in mispricing and the accrual anomaly. Meanwhile, although investors observe mispricing, they cannot quickly restore market efficiency because of the higher cost of arbitrage and risk (Lev

and Nissim, 2006; Mashruwala, Rajgopal, and Shevlin, 2006), and so we observe the accrual anomaly in the securities market.

Some Chinese scholars have started to test the accrual anomaly in recent years. Using the method of Sloan (1996) and data from 1998 to 2008, Liu (2003) finds that the persistence of accruals is lower than that of cash flow, but he obtains an abnormal return of only about 3.1 per cent on average when following Sloan's investment strategy. Wang (2005) finds that the cumulative abnormal return (CAR) of Sloan's investment strategy is 9.7 per cent in the following year when specially treated and particularly transferred companies are excluded. Research on A and B shares by Jiang, Li, and Niu (2006) shows that a remarkable accrual anomaly exists in the A-share and B-share markets in China, and that reports of domestic and foreign earnings differ, demonstrating that different accounting standards also influence market efficiency. The research conclusions of Li and Niu (2007) show that the delisting system in China has a profound influence on the behaviour of deficit companies and their value, which should be properly controlled for in research design.

Compared with foreign research, research on the accrual anomaly is far from systematic in China, and it remains focused on the anomaly's existence such that little research has examined why it actually forms. The primary role of accounting information is its usefulness in decision-making, which is realised through accounting accruals. If investors are not able to understand the meaning of accruals, accounting information will play only a restricted role when investors price stocks. Therefore, it is necessary to further study the causes of the accrual anomaly, which is not only an important component in understanding the price discovery process of capital markets, but also the basis for evaluating and guiding the establishment of accounting standards.

## **2.2 The Limited Attention of Investors and its Demonstration**

Attention is a kind of rare resource and a kind of substitution from one task to another in cognitive resources. Kahneman (1973) puts forward an attention model, regarding attention as a kind of conscious activity based on the input processing of external information, whose processing capacity as a whole may increase or decrease in response to external stimuli. Meanwhile, rules and strategies exist for deciding all kinds of allocation of conscious resources and different processing stages. Kahneman (1973) holds that limited attention is an inevitable outcome under an environment with a great deal of information, because people have limited capacity to process information and need to make an effort to screen such information.

Limited attention is also inevitable in decision-making when several tasks need to be accomplished at the same time. People will have a weaker reaction to the relevant stimulus when they are distracted, and limited attention will result in lower efficiency in processing information (Cherry, 1953; Broadbent, 1958; Moray, 1959; Simmons and



Levin, 1997). When many stimuli occur simultaneously, tasks will be fulfilled very poorly (Treisman and Davies, 1973; McLeod, 1977).

Although specific information relevant to a company exists in the market, people have limited capacity to process information and execute a task simultaneously; thus, investors will behave differently because of different attention levels. Limited attention is concretely demonstrated in the stock market, since it is impossible for investors to consider all relevant information owing to limited time and energy, and so their ability to analyse information is restricted to some degree (Aboody *et al.*, 2008). Investors are also not equipped with sufficient energy and capacity to process and absorb all available information, resulting in an insufficient response to the corresponding information of stock trends. Limited attention offers a good interpretation for all kinds of anomalies in the market, such as the equity premium puzzle (Lynch, 1996; Gabaix and Laibson, 2001; Rogers, 2001), insufficient response to unexpected earnings (Hirshleifer and Teoh, 2003; Hou, Peng, and Xiong, 2008) and earnings forecasts (Doyle *et al.*, 2003), price reaction to Friday disclosure of earnings information (DellaVigna and Pollet, 2009), excessive optimism about a company's high level of net operating assets (Hirshleifer and Teoh, 2003), a rising average stock price near the earnings announcement date (Frazzini and Lamont, 2007), abnormal stock purchasing by individual investors near the earnings announcement date (Barber and Odean, 2008), and insufficient response to stocks recommended by analysts (Loh, 2009).

Whether investors are individual or institutional, a great deal of literature indicates that their decision judgments and behaviour patterns are influenced by limited attention. Hirst and Hopkins (1998) confirm that financial analysts with professional skills are often unable to timely and correctly respond to complicated financial disclosures. Hirshleifer and Teoh (2003) find that different information disclosure methods by a company have an influence on its stock price; for example, investor behaviour and feelings can be influenced when the disclosed information has the same content but in different form. Peng (2005) and Peng and Xiong (2006) point out that investors with limited attention tend to follow simple decision-making rules and pay attention only to the industrial aspects of companies in the securities market instead of a specific company's status.

### **2.3 Influence of Limited Attention on Pricing Errors**

Since investors have limited capacity to absorb and process information, stock prices will not be greatly influenced under the state of limited attention even though events influencing a company's earnings occur. That is to say, event effects will not be reflected in the stock price of a company, so that stocks will be mispriced.

DellaVigna and Pollet (2009) test the influence of Friday or non-Friday announcements (weekend samples excluded) on the information reading of investors and find that they pay less attention to stock markets and daily commercial activities on Fridays. Consequently, compared with earnings announcement events on non-Fridays,

earnings information disclosed on Fridays tends to be ignored by investors, who do not thoroughly read earnings information, leading to stock pricing errors. As a result, stock prices have a weakened instant reaction to information, and there is an increase in delayed response. Hirshleifer, Lim, and Teoh (2009) also point out that investor attention is influenced by the number of earnings announcements disclosed on the same day, since investors have limited attention, and information processing requires time and cost. The higher the number of companies disclosing earnings announcements, the more difficult it is for investors to process information. Investors are thus unable to react timely to earnings information, and stock pricing errors temporally occur. Hou, Peng, and Xiong (2008) use stocks under different market conditions and turnover rates to express investors' high or low attention levels, and study the influence of investor attention on the price momentum anomaly and the earnings momentum anomaly. They find that investors intensify their overreaction to earnings information as their concentration of attention increases, and vice versa. Jin (2009) measures the difference in levels of attention given companies in terms of the number of analysts following a firm, institutional shareholding ratios, and whether audited by the international Big Four firms, and finds that the focus of investor attention decreases the probability of stock pricing errors. In other words, investors obviously make fewer pricing errors respecting companies followed by more analysts, whose shares are held by more institutions, and who are audited by the international Big Four firms. Ali and Gurun (2009) test the relation between the type of investor and the pricing errors of accruals, and point out that compared with institutional investors, individual investors tend to be influenced by limited attention. They also measure the shareholding proportions of institutional investors by company size and find that bigger companies with higher shareholding proportions by institutional investors are more likely to be influenced by limited attention, while investors make fewer pricing errors on these companies' earnings components.

#### **2.4 Demonstrations of Investor Psychology and Behaviour under Different Market Conditions**

There is a big difference in investors' psychological expectancy between different market conditions, which directly results in dissimilar investing psychology and behavioural choice. According to *The Economist* (2002), investors do not carefully check financial information when they are in high spirits and overly optimistic about prospects, and pay less attention than they should if they understood financial information. Povel, Singh, and Winton (2007) point out that investors put less energy into reading the information of financial statements in boom periods of stock markets compared with depression periods; at the same time, problems in financial statements tend to be hidden during the boom periods. Ali and Gurun (2009) indicate that investors in high spirits pay less attention to decision-making or to differences in persistence between various earnings components, so that limited attention has greater influence. Li (2009) measures

investors' emotional cycles against the cycles of moon phase changes and finds that stock returns have the same cyclical fluctuation as the rise and fall in investors' emotions; such influence is magnified in a bull market. Lin and Yu (2010) report that investors' irrational "emotional impulses" are asymmetrical in different market conditions. When asset prices are high, their emotions clearly influence their transaction decisions, demonstrating irrationality; when prices are low, their transactional behaviour is more likely to be influenced by fundamentals, and so irrationality indicators do not have a significant influence. According to Li, Li, and Wu (2010), levels of corporate governance influence investors' confidence in the persistence of earnings in the US securities markets as well as their reactions to unexpected earnings information, which is driven mainly by a bull market. According to Chunyu, Yang, and Yang (2007), funds, as a major component of institutional investors, change their investment behaviour in line with market trends, meaning that investors show differences in their psychology and behaviour as the market fluctuates.

It can thus be seen from the above literature analysis that the influence of investor attention on transactional behaviour and information reading has been given increasing importance in the research on investor attention. In China, however, only a few studies examine investor capacity to read information and decision-making behaviour from the perspective of attention; in particular, even less literature has investigated the accrual anomaly from the perspective of behaviour by incorporating the concept of limited attention in behavioural finance and accrual-based accounting. This paper is thus intended to look into this issue. Moreover, it studies the role of the different psychologies and emotions of investors at different stages of the stock market cycle with respect to the influence of limited attention.

It is, however, very hard to observe investor attention directly, and so most literature indirectly measures it through characteristic variables, such as turnover rate, institutional shareholding ratio, number of analysts following a firm, company size, and advertisement input of a company. But although these indicators can reflect the level of investor attention to a certain degree, they also produce a bigger noise since they are extracted from the securities markets, and are intrinsic to the transactional characteristics and price behaviour of financial assets. Moreover, since the securities markets in China are increasingly developing and maturing with institutions and analysts growing stronger, attention data cannot be compared between different stages. A weekly cycle, however, is an exogenous indicator independent of the securities market, and compared with the above-mentioned indicators, it can be used to measure investor attention more clearly so as to avoid complicated social influence on the study. Moreover, changes in a weekly cycle are stable, regardless of the year, market, or influence of company characteristics, making it possible to test the universality and persistence of the influence of investor attention on information reading. Meanwhile, changes in a weekly cycle have only a limited impact on economic and social activities; investigating the relation between

investor attention and efficiency of information reading based on days in a weekly cycle can thus also be an effective test of whether attention will influence asset pricing and decision-making behaviour. Therefore, this paper adopts different days in a weekly cycle to measure differences in investor attention allocation. According to both the arousal theory of attention in cognitive psychology and the cognitive resource theory, we put forward that investors will have a lower level of emotional arousal, a higher level of attention concentration, and more available cognitive resources on weekends than on weekdays.

Although DellaVigna and Pollet (2009) also measure investor attention by days in a weekly cycle, our research design differs from theirs. Firstly, DellaVigna and Pollet study the influence of investor attention on distinguishing the capacity of unexpected earnings, whereas we study its influence on the ability to price earnings components. Secondly, because information on earnings announcements is rarely disclosed on weekends in the US, DellaVigna and Pollet delete samples of weekend announcements; in China, however, about 23 per cent of companies disclose earnings information on weekends,<sup>1</sup> which is when most policy information is also disclosed. The trend of stock prices on Monday partly reflects investor reaction to earnings information on the previous weekend as well as on the same day. When earnings announcements disclosed on weekends account for a larger proportion of announcements, deleting weekend samples will produce a large error, and therefore we cannot delete these samples when testing the Chinese securities markets. Furthermore, although Chinese and US investors share the same mechanism characteristics and their allocations of attention levels on different days in a weekly cycle are similar, the disclosure mechanisms, cultural backgrounds, and economic systems differ between China and the US; thus, a different allocation of investor attention may have a different influence on the demonstration and degree of information reading in the Chinese stock markets compared with the British and US mature markets. Rebok (1987) suggests that when the attention system is activated to different degrees, perceptual information input also differs; also, the final manifestation of information understanding is an outcome of the interaction between internal and external stimuli. Therefore, although attention is fixed, information understanding will differ greatly according to different degrees of stimulus. For example, because earnings announcements are rarely disclosed on weekends in the US, investors have more attention capacity on weekends but it will not be aroused. In China, however, most earnings information and policy information are disclosed on weekends over a long period, enabling investors to form the habit of paying more attention to stock markets on weekends; weekends have thus become the persistent excitement focus of Chinese investors. The constituent

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<sup>1</sup> We collect data on earnings announcement dates of US listed companies from Compustat, and find that only a very small proportion of announcements are disclosed on Saturdays and Sundays; only about 0.088 per cent are disclosed on Saturdays and about 0.098 per cent on Sundays. Meanwhile, we test the data on earnings announcement dates of Chinese listed companies from 1998 to 2006 and find that 4.69 per cent, 23.13 per cent, 14.68 per cent, 15.57 per cent, 19.20 per cent, and 22.73 per cent of earnings announcements are disclosed on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, respectively.

categories of Chinese investors also differ from their foreign counterparts' since the Chinese markets are still dominated by medium and small investors. In addition, the Chinese stock markets have higher synchronicity, and market-specific and board-specific information plays a major role in asset pricing. These differences in the constituents of investors and system backgrounds may thus trigger a different interaction in respect of the influence of investor attention on the efficiency of reading information. The above-mentioned reasons therefore stimulate us to observe and study the influence of investor attention on investor information reading and decision-making behaviour in the Chinese securities markets.

### **III. Theoretical Analysis and Hypotheses Development**

The decision-making process consists of the processing, analysis, transformation, and integration of information. Decision makers analyse and dispose of given known information, seek and discover implicit relevant information resources in the known information, integrate and reprocess these resources, establish a unified solution with correct logical meaning, and then execute the solution. This is the process of decision-making. During this process, people have different cognitive resources in terms of attention, subjective initiatives, cognitive needs, and devoted cognitive efforts, which in the end influence the depth of information processing by individuals as well as decision-making results.

According to Kahneman (1973), attention is the direction and focus of psychological activities on given objects as well as an important condition of cognitive activity. Individuals are restrained by limited cognitive resources when classifying and recognising stimulus information. The limitedness of cognitive resources, however, is relative and not a fixed quantity value, being connected with arousal. The arousal level decides the quantity of cognitive resources of attention in a certain period. Meanwhile, a proper allocation of cognitive resources decides the individual efficiency of information processing, while their allocation mechanism is flexible and able to be adjusted and controlled according to people's actual needs, where familiar tasks are preferred for processing. Therefore, both arousal and the allocation of attention together influence individual capacity to process information.

Information processing theories of attention include mainly the arousal theory, the theory of selective attention, and the theory of distributed attention. According to the arousal theory, the arousal level refers to the different states or degrees of general physiological activation of an organism. It is an important variable for people in adjusting the effective use of information, while providing energy for maintaining and focusing attention (Zhang and Ren, 2000) and influencing the attention process (Easterbrook, 1959; Bacon, 1974; Nigg, 2006; Ma and Zhang, 1998). Emotional arousal can consume individual cognitive resources. When individuals remain calm and relaxed at a state of low arousal, they are impelled to reflect and make cognitive adjustments, and this self-

controlled “cool” system plays a major role. With sufficient available cognitive resources and focused attention, individuals can widely collect and process cues with higher cognitive efficiency (Kahneman, 1973; Mischel and Ayduk, 2002). As the arousal level increases, such as when an organism remains anxious and tense, the “hot” system, which is inclined toward avoidance or staying away, begins to assume the dominant position, and this greater emotional arousal will consume partial cognitive resources such that individuals will allocate fewer attention resources to other information; in other words, attention capacity decreases (Eysenck and Calvo, 1992; Runco and Pritzker, 1999). The range of information from the outside environment will thus be restricted (Bahrick, 1954). This limited attention will also continuously enhance the earlier higher arousal level, resulting in more distracted attention (Easterbrook, 1959; Janelle, Singer, and Williams, 1999; Janelle, 2002) and lower cognitive efficiency. The level of individual emotional arousal thus influences the allocation of attention as well as the efficiency of cognitive operation.

According to the theorem of Yerkes-Dodson (1908), an optimum point of emotional arousal level exists in any cognitive operational activity, which changes with the complexity of operational activities. The more complex an activity is, the lower the optimum point of emotional arousal (Broadhurst, 1957; Wolford and Hollingsworth, 1974). Mano (1992) and Franken (2005) point out that the way to obtain optimum performance is to learn how to control personal arousal levels in order to better focus attention and increase available cognitive resources, meaning that individuals should learn how to relax themselves. Drawing on the arousal theory, some literature has tested the influence of individual emotional arousal levels on academic performance and decision-making behaviour. For example, Weingartner *et al.* (1981) find that compared with subjects with low emotional arousal, subjects with higher arousal perform worse when performing memory tasks requiring greater effort. Ellis *et al.* (1991) find that when the task is not very difficult, high emotional arousal has little or no influence on memory performance, whereas if the task is more difficult, high arousal has a more negative effect. Qiu and Wu (2005) study the influence of emotional arousal levels on tourism decision-making and find that high levels lead to cognitive dissonance and influence decision-making behaviour. Yu and Dong (2007) find that low emotional arousal facilitates the cognitive processing of attention; subjects in positive low emotional arousal have the shortest response time and the least restraint capacity, whereas in a state of high emotional arousal fewer attention resources are allocated in ongoing cognitive activities.

Among attention allocation theories, the cognitive resource theory of attention maintains that the human brain processes information in a serial manner, in which the coordination and allocation of attention are involved when a person simultaneously executes no fewer than two tasks. Attention can be seen as a cognitive resource with limited capacity or energy in recognising and processing stimulus information. Every cognitive-activity need takes up and consumes certain cognitive resources; for example,

complicated stimulus information requires greater resources. Several complicated tasks needing to be finished at the same time will thus use up cognitive resources, and any new emerging stimulus information will not be processed or handled—in other words, such information will not be noticed. As a result, under most circumstances only one of the tasks needing attention can be finished, although it is possible to execute two or more activities depending on the difficulty level or similarity of tasks and personal skill and practice. The difficulty of the tasks to be processed will thus influence the process of attention allocation. Generally speaking, when a difficult task conflicts with a relatively easy task, the easier one is more likely to be processed or handled.<sup>2</sup> Following the cognitive resource theory, some literature examines the influence of attention allocation in multitasking on cognitive effects. For example, Li and Pao (2000) point out that relative to a gymnastic sprint, the box horse is a more complicated sporting event that requires the consumption of greater cognitive resources. A gymnast's limited attention does not have a big influence on performing a simple sprint, but does have a greater negative influence on performing a box horse. Wang and Huang (2005) find that when attention resources are sufficient, whether external cues are obvious or not, full information processing can be obtained. But when attention resources are restricted, obvious cues can be fully processed without using too many resources whereas inconspicuous cues cannot, because processing is difficult and attention resources are lacking. According to Lin and Zhang (2006), anxiety can take up resources of the working memory system and distract an individual's attention; this individual can, however, use the remaining cognitive resources to smoothly finish a task with lower difficulty because such a task does not require many cognitive resources. But a task with higher difficulty requires complicated conscious processing, and so limited attention results in a lower processing efficiency of the task.

Many factors influence attention, such as the physical properties of stimulants; the external environment; personal needs, interest, emotions, and will; as well as existing knowledge and experience. Different days in a weekly cycle can be considered an external stimulus variable that influences the arousal and allocation of an individual's attention and subsequently influences the processing efficiency of decision-making tasks.

According to Cranford *et al.* (2006), Canadian psychologist Debbie Moskowitz has found through research on the behavioural regularities of individuals that in the course of a week, individual physiology, organism state, and organisational work efficiency periodically change. Durkheim (1951) indicates that compared with weekdays, individuals show a calmer mental state and a more relaxed organism state on weekends. Dodds and Danforth (2009) and Ryan, Bernstein, and Brown (2010) find that individuals are not restrained by routine work on weekends, they can freely take charge of their own time, and they participate in more entertainment activities (Sheldon *et al.*, 1996; Zhong *et al.*, 2008). Thus, on weekends individuals usually feel more relaxed with lower

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<sup>2</sup> Liang, 2003, *Contemporary Cognitive Psychology*, Shanghai: Shanghai Education Press, pp. 1-28, 85-106.

emotional arousal levels (Rybczynski, 1991; Fritz and Sonnentag, 2005), they can focus their attention on behaviour conducive to their goals with a higher level of consciousness, and they can widely collect and reasonably process cues, contributing to the promotion of cognitive operational activities (Storbeck and Clore, 2008). Rossi and Rossi (1977) and Hockey, Maule, and Clough (2000) use questionnaire surveys and behaviour observation experiments to find that compared with weekends, individuals are more restrained by routine work on weekdays (Reis *et al.*, 2000; Zhong *et al.*, 2008); they also feel more anxious and bored and they experience the pressure of more intense mental states and higher emotional arousal levels (McFarlane, 1981; Larsen and Kasimatis, 1990; Kennedy-Moore *et al.*, 1992; Mano, 1992). Such emotional arousal will consume partial attention resources, so that available cognitive resources decrease and attention becomes more distracted and overly sensitive. Individuals have fewer opportunities to carry out self-integration, and cognitive operational activities will be restrained or disturbed (Thayer, 1989). Investors, moreover, need to process tasks of different quantities and difficulties simultaneously at different stages of the weekly cycle. On weekdays they must handle routine work, leading to the problem of allocating attention between such work and reading earnings information, such as annual and interim reports, if it appears in the securities markets. On weekends, however, investors have more free time with a weaker disturbing effect of routine work and are not typically involved in the problem of coordinating and allocating attention between two tasks.

Therefore, combining changes in the individual state of a physiological organism, behavioural regularity, and quantity of tasks in a week, and drawing on both the arousal and the cognitive resource theories of attention, we deduce that investors will require greater cognitive resources to complete the dual tasks of handling routine work and reading earnings information on weekdays. But at the same time, a higher level of emotional arousal will restrain the quantity of available cognitive resources. Compared with understanding earnings information in the securities markets, it is easier for investors to handle routine work, which is simpler to process, so that fewer cognitive resources of attention are allocated to reading earnings information; decisions are thus quickly made in line with known task cues, intuition, and accumulated experience, and the efficiency of reading earnings information is reduced. On weekends investors are not bothered by dual tasks since they face single decision-making tasks. Moreover, a lower emotional arousal level allows them to better focus their attention while better equipping them with more sufficient cognitive resources so that they can allocate greater attention resources to reading earnings information. They can also actively explore and collect all kinds of information relevant to their decision-making tasks and actively think through and process the information, thereby increasing processing efficiency and weakening the likelihood of making pricing errors. On this basis, we put forward the following hypothesis:



**Hypothesis 1: Although the persistence of accruals is lower than that of cash flow, investors are not able to recognise such differences in earnings announcement information disclosed on weekdays and so will overestimate the persistence of accruals and underestimate that of cash flow, resulting in pricing errors of earnings components. They are, however, able to recognise such differences in information disclosed on weekends, without making pricing errors.**

The persistence of accruals is one of the important indicators for measuring earnings quality. Higher earnings persistence helps investors to forecast more precisely the future yearly earnings of an enterprise, while lower earnings persistence is more likely to cause them to overestimate future earnings; also, earnings of lower quality will occur in the next earnings announcement, leading to a fall in the stock price. Since accruals are fixed, and since accruals and cash flow are negatively correlated, the following will be tested with accruals as the example. The earnings persistence of enterprises with higher accruals will be lower, and pricing errors will not exist if investors correctly read earnings information. But if they cannot fully understand the persistent difference between accruals and cash flow in earnings and so overestimate accruals, they will erroneously price stocks, resulting in lower future returns for enterprises with high accruals. On this basis, we put forward the second research hypothesis:

**Hypothesis 2: Compared with earnings announcements disclosed on weekends, investors are more likely to make pricing errors based on earnings announcement information disclosed on weekdays, meaning that current accruals and future cumulated abnormal returns will have a reinforcing negative relation.**

A cycle in a stock market is a process in which long-term uptrends and downtrends alternatively appear and continuously recycle. Under different market environments, investors have very different emotions and psychological expectations, which can directly result in dissimilar psychologies of investment and behavioural choices and influence the allocation of their attention. In a bull market, good news is often strengthened and bad news weakened. Investors will overestimate the rate of future return of stocks (Lee, Shleifer, and Thaler, 1991); have positive attitudes towards macroscopic aspects, the earnings prospects of listed companies, and their investment portfolios; and be more optimistic about the future performance of stocks and the aftermarket (Baker and Stein, 2004; Karlsson, Loewenstein, and Seppi, 2005; Liu, 2006). Thus, they will not be very worried about the potential losses caused by pricing errors stemming from a lack of analysis. They have fewer cognitive needs, their attention level is weakened, and they are reluctant to put greater cognitive effort into collecting relevant information. They are also unwilling to explore decision-making tasks and tend to make instant decisions. In a bear market, however, investors lack confidence. They are pessimistic about the macro-economic outlook and earnings prospects of listed companies and are more prudent in making decisions such that they tend to postpone them. Their cognitive needs

thus increase, and they are more likely to expend energy reading company earnings information.

It is thus evident that external market conditions influence the attention allocation and cognitive needs of investors, while the level of such influence depends on the degree of investor attention. Since investors pay more attention to earnings information disclosed on weekends with stronger cognitive motivation, their devoted attention is not much influenced by market conditions. But for earnings information disclosed on weekdays, market conditions obviously influence the devoted attention of investors, and their limited attention results in weaker motivation to actively collect information. This is further weakened in a bull market, thus aggravating pricing errors. But in a bear market, investors will be cautious about making decisions. Although they can devote only limited attention, their cognitive needs are intensified compared with the situation in a bull market. They will collect more relevant information to help in making decisions, and pricing errors will be restrained to some degree. Therefore, in a bull market, the limited attention of investors will have greater influence on pricing errors, meaning that the varying levels of investor attention resulting from different disclosure times of earnings announcements will have a more exceptional influence on the capacity of investors to read information. In line with the above analysis, we put forward the third hypothesis:

**Hypothesis 3: Different levels of investor attention will influence the pricing errors of accruals differently at different stages of the stock market, with greater influence on pricing capacity in a bull market.**

## **IV. Sample Selection and Variable Definitions**

### **4.1 Sample Selection**

We select and use all A-share listed companies in non-financial businesses from 1998 to 2006 as the research samples. Because Chinese listed companies have been disclosing statements of cash flow since 1998, our sample period begins with that year. Moreover, since 2007 company financial reports have been prepared in accordance with new accounting standards, and so we cut the sample period at 2006. We take all financial data and market transaction data in annual reports and interim reports of the sample companies from the sub-databases of the Chinese Stock Market Research Database (CSMAR).

Because this paper examines the difference in levels of investor attention along a time series, more precise announcement data of actual earnings are required. Therefore, we integrate the results of two databases, the CSMAR and WIND, to measure actual earnings announcement dates. To confirm the final announcement dates, we adopt the following rules: (1) When the earnings announcement dates are the same between the two databases, we use the date of either database as the final actual date; (2) when the earnings announcement dates between the two databases have a discrepancy of more than 5 days, we manually collect the actual announcement date for that observation; (3)

when the earnings announcement dates have a discrepancy of less than 5 days, we use the earlier one as the actual announcement date for that observation.

We apply the following rules in selecting the samples: (1) the stock should disclose its annual report or interim report during the set period of time, or otherwise it is excluded; (2) earnings of the current year as well as net assets should be positive (Li and Niu, 2007); and (3) the data of individual stock returns must be complete for the sample period. After screening and processing, we finally obtain effective samples with 11,350 observations. To control for the influence of abnormal values on the research conclusions, we winsorise all variable data at the 1 per cent and 99 per cent levels.

## **4.2 Variable Definitions**

### **4.2.1 Measurement of Investor Attention**

According to the foregoing theoretical analysis, individuals have a higher emotional arousal level on weekdays and their cognitive resources of attention are restrained. Meanwhile, they must handle an enormous amount of work on weekdays and so allocate less attention to processing earnings information in the securities markets; the result is a weakened capacity to instantly reading information. On weekends (referring mainly to Saturdays since earnings are not announced on Sundays), individuals are in a more relaxed state with lower emotional arousal levels and higher levels of consciousness such that they are able to focus more cognitive resources of attention. Meanwhile, they are not constrained by work on weekends and so pay more attention to the markets. Therefore, we use the days of a weekly cycle to measure levels of investor attention with regard to earnings information in the securities markets, where weekdays are defined as the days when investors are distracted, and weekends the days when they focus their attention.

### **4.2.2 Total Earnings, Cash Flow, and Accruals**

To confirm the size of accruals, we can choose the balance sheet method or the cash flow statement method. Drtina and Largay (1985), Revsine, Collins, and Johnson (1999), and Hribar and Collins (2002) all indicate that more serious errors might occur when the balance sheet method is used to measure accruals. In recent years a great deal of literature has adopted the method of cash flow statements to calculate accruals, and so we follow suit and define accruals as the net amount of total earnings minus cash flow, and total earnings as net profit plus financial expenses;<sup>3</sup> we further take cash flow as the net amount of flow from operating activities as found in the cash flow statement disclosed by the enterprise.

Most literature with respect to the accrual anomaly follows the method of Sloan (1996) and focuses on studying yearly samples. But there are certain limitations in the

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<sup>3</sup> Because financial expenses are not considered in calculating operating cash flow, liabilities such as short-term borrowing relevant to financial activities will be taken out when accruals are calculated using the balance-sheet method. Therefore, total earnings should not include financial expenses when accruals are calculated with total earnings and cash flow.

tests of these samples. First, accruals are established to mitigate the problems of weak timeliness of cash flow and matching when company performance is measured in a given period (Watts and Zimmerman, 1986; Dechow, 1994; Dechow *et al.*, 1998). For short intervals, the problems concerning the timeliness of cash flow and matching are more outstanding, while accruals can provide more supplementary information relevant to values. For long intervals, on the other hand, cash flow and company performance have a stronger convergence, and so accruals play a weaker role. Therefore, investor capacity for response and discernment can be better tested when measuring in shorter intervals, such as quarterly. Second, investors react not only to annual reports but also to quarterly and interim reports. In fact, the partial information listed in annual reports has already been disclosed in the interim reports, and so we cannot test how investors react to information given in interim reports using annual samples. From the fifth month after the financial year-end, the size of cumulative abnormal returns is used to test investor capacity for discernment in the persistence of different earnings components, which in fact demonstrates how investors react to earnings information in the fourth quarter but is unable to fully demonstrate their capacity to price such information in former quarters. Third, annual reports are audited by an independent third party and so are more reliable, while investors may have varying capacities to price the earnings components disclosed in interim reports and annual reports. Therefore, in recent years, some scholars have started to test quarterly samples (such as Collins and Hribar, 2000; DeFond and Park, 2001; Livnat and Santicchia, 2006; Livnat and Lopez-Espinosa, 2008) and have found that investors similarly cannot tell the difference in persistence between different earnings components in quarterly reports, thus resulting in pricing errors.

Therefore, we adopt a shorter interval to conduct the measurement. Considering that the China Securities Regulatory Commission (CSRC) did not require listed companies to disclose quarterly reports until 2002, if we select such reports as the research samples, only a few samples with a shorter time span will be available. Because a short time span is unsuitable for testing how investor attention influences pricing capacity with changes in external market conditions, we instead select data in the interim and annual reports from 1998 to 2006 for the test. We define accruals and cash flow in rolling measurements, contributing to the stability of the data and reducing the influence of large provisions and reversals of accruals caused by earnings manipulation (Livnat and Lopez-Espinosa, 2008). Moreover, rolling measurements help us obtain test results not only from traditional annual data<sup>4</sup>—which is convenient in comparing our results with other annual results from research on the accrual anomaly—but also from the interim financial reports for comparison with annual differences. Rolling accruals or cash flow defined by such methods in a certain half-year is equal to the accruals or cash flow for that half-year plus those for the former half-year. Indicators for the first half-year come mainly

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<sup>4</sup> If the rolling accruals in the second half of year  $t$  are equal to the sum of accruals in both the first and second halves of year  $t$ , namely the total accruals of year  $t$ , testing the second half is actually the same as testing the traditional annual sample.

from data disclosed in interim reports, while those for the second half-year are obtained from the data in annual reports after deducting the data of the first half-year disclosed in the interim reports. Moreover, to eliminate the influence of size, we standardise the average balance of total assets in the above indicators between the beginning and the end of the current period. We successively define rolling earnings, rolling accruals, and rolling cash flow of the half-year involved in this paper as follows:

$$ERAN_t = ERAN'_t + ERAN'_{t-1}, ACC_t = ACC'_t + ACC'_{t-1}, CFO_t = CFO'_t + CFO'_{t-1}$$

#### 4.2.3 Calculation of Abnormal Rate of Return

The rate of cumulative abnormal returns can be calculated as the size-adjusted, risk-adjusted, and market-adjusted abnormal rates of return. Most literature adopts the size-adjusted rate when testing the accrual anomaly. All companies are classified into 10 groups in accordance with company size (total market value of equities) on the last trading day in every half-year. The average rate of return of each size group for the test period is calculated, and the size-adjusted rate is then obtained by subtracting the average rate of return of a size group from a company's original rate for the test period. This paper also adopts this method of size adjustment to calculate the abnormal rate of return.

Earlier literature often selects the consecutive 12 months starting from the fifth month after the end of a financial year as the interval for forming the rate of cumulative return when this rate is established after the earnings announcement, but this method is very crude. Sloan (1996) believes that two-thirds of cumulative abnormal returns formed at the interval of 12 months appear during the period of earnings announcements—meaning during the 12 days before and after the disclosure of earnings information in the following four quarterly reports<sup>5</sup>—and that the making of pricing errors is actually the lagged effect when investors are unable to correctly recognise the true persistence of current earnings components. So pricing errors appear mainly at the time of the disclosure of earnings information in the current period, when the low persistence of current accruals is reflected in lower actual earnings in the following period and presented to the public. Therefore, the more accurate method for measuring the cumulative abnormal return is to select the interval from the second day after the disclosure of earnings components to the day when the subsequent period of earnings information is disclosed (Livnat and Santicchia, 2006; Livnat and Lopez-Espinosa, 2008). In other words, this is the interval starting from when investors know the respective proportions of accruals and cash flow in earnings for the current period and so make decisions until the announcement of earnings for the subsequent period, and during which they do not realise they are overestimating the persistence of accruals or underestimating that of cash flow.

<sup>5</sup> The period of earnings announcements begins from two days ahead of every quarterly earnings announcement to the actual day of announcement, so every period of announcements lasts three days.

For the half-year or year  $t$ , the cumulative abnormal return of stock  $k$  for the period  $[t+h, t+H]$  can be expressed as

$$RET_{t,k}^{(h,H)} = [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,k}) - 1] - [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,s}) - 1],$$

where  $R_{j,k}$  is the actual rate of return of stock  $k$  on day  $j$ , and  $R_{j,s}$  the total market-capitalisation-weighted average rate of the market return of the size group to which the individual stock belongs on day  $j$ .  $\tau$  refers to the disclosure date of actual earnings of individual stocks in the half-year or year  $t$ . We select the interval from the second trading day after the disclosure of the interim report or the annual report to the day on which the next annual report or interim report is disclosed as the test period to measure investor capacity to price earnings components.<sup>6</sup>

#### 4.2.4 Identification of a Stock Market Cycle

To identify a stock market cycle, we adopt the nonparametric method to test both the bull and the bear market cycles in the Chinese stock markets. Considering that the Chinese markets have been developing for only a short time and so fluctuate more frequently compared with developed stock markets, we use the nonparametric method by which the stock market cycle and economic cycle are defined by seeking the peaks and troughs of the waves. This method is widely used in similar literature (Bry and Boschan, 1971; Harding and Pagan, 2002; Edwards *et al.*, 2003; Pagan and Sossounov, 2003; Kaminsky and Schmukler, 2008; He and Zhou, 2006). It is able to capture large rises and falls of stock prices in the short term and is more suitable for the actual situation in the Chinese markets. In view of the Chinese situation, we make proper adjustments to the criteria of distinguishing between the bear and bull markets put forward by Pagan and Sossounov (2003). The monthly price level of the stock markets is expressed as  $P_t$ , and the logarithmic price is  $P_t = \ln(P_t)$ . At first, we preliminarily identify the peaks

<sup>6</sup> Reviewers of this paper point out that whether stages of a weekly cycle in earnings announcements are persistent may influence our research conclusion. For example, current earnings announcements on weekdays may result in more serious mispricing by investors; future quarterly reports and semi-annual reports may not be disclosed on weekdays but on weekends, so that mispricing may be less according to the logic of this paper. Therefore, it is very difficult to decompose the true attention effect empirically. Sloan (1996) considers that abnormal returns caused by insufficient understanding of earnings components emerge mainly during the period of earnings announcements. So we set the time window of future investment returns to end at the time when the next earnings announcement is disclosed, instead of directly selecting 12 months similar to that adopted in the traditional literature on the accrual anomaly. Therefore, investor response to current earnings information will not be disturbed by earnings information for the subsequent period. Current earnings information influences only investor reading levels of that information, whether it is disclosed on weekdays or weekends, and investors will not be influenced by the stages of the weekly cycle of the subsequent earnings announcement. In other words, insufficient investor attention in period  $t$  results in pricing errors of earnings components in that period, but the resulting abnormal returns occur mostly during the time of earnings announcements for period  $t+1$  (because only after investors compare actual earnings with expected earnings can abnormal returns occur). But its formation and numerical size are not influenced by earnings information for period  $t+1$ , whether disclosed on weekdays or on weekends. Because investors have made pricing judgments on the earnings components for period  $t$  after the earnings information for that period is disclosed, the stages of the weekly cycle in which the information for period  $t+1$  is disclosed influence only investor reading of earnings information for the latter period. The influence of investor attention levels on capacity to price earnings components in period  $t+1$  when earnings information for that period is disclosed is reflected mostly when earnings information for period  $t+2$  is disclosed. Therefore, whether the stages of the weekly cycle in the earnings announcement are persistent do not influence our research conclusion.

and troughs of the waves of stock prices in accordance with two steps: (1) if  $P_t$  is the maximum value in the price window with a width of 3 months, namely  $P_{t-3} \dots P_{t-1} > P_t < P_{t+1} \dots P_{t+3}$ , then  $t$  corresponds to the peak. If  $P_t$  is the minimum value in the price window with a width of 3 months, namely  $P_{t-3} \dots P_{t-1} > P_t < P_{t+1} \dots P_{t+3}$ , then  $t$  corresponds to the trough.

To avoid omitting the big bull and the big bear corresponding to the big rise and fall in stock prices in the short term and excluding the false bull and false bear market cycles, the tested bull and bear market cycles should also satisfy the following conditions: (1) if a one-way period of the bull or bear market is no longer than 4 months, the range of price rise and fall must exceed 20 per cent before and after the stock market prices are reversed; (2) peaks and troughs must be at least 4 months from the sequence endpoints; (3) peaks must not have with a stock price near the sequence endpoint lower than the stock price at the endpoint, nor should troughs have a stock price higher than the stock price at the endpoint; (4) bull and bear market cycles must have a cycle range of at least 6 months. Moreover, to ensure an alternate appearance of peaks and troughs, we eliminate the lower prices in consecutive peaks and the higher prices in consecutive troughs.<sup>7</sup> The final available stock market cycles from 1 January 1998 to 31 December 2006 are distributed as in Table 1.

**Table 1** Distribution of Bull Markets and Bear Markets (1 January 1998 – 31 December 2006)

Bull market	Bear market
1998.01–1998.06	1998.07–1999.02
1999.03–2001.06	2001.07–2002.01
2002.02–2002.07	2002.08–2002.12
2003.01–2003.04	2003.05–2003.11
2003.12–2004.03	2004.04–2005.07
2005.08–2006.12	

For control variables, we use two basic dummy variables for disclosure year and month to control for different external regulatory environments along the time series that may influence the results. Following methods described in the relevant literature, and in view of some essential features of the data in our research, we also adopt several other control variables, including company size ( $LnMV$ ), book-to-market ratio ( $B/M$ ), earnings-price ratio ( $E/P$ ), current return ( $R$ ), stock price at the end of the current period ( $PRICE$ ), and current turnover rate ( $VOL$ ). Since  $LnMV$ ,  $B/M$ , and  $E/P$  reflect the potential risk and growth potential of a company to some degree, these indicators may influence subsequent abnormal returns as well as investor response to earnings information and so need to be controlled for (Sloan, 1996; Collins, Gong, and Hribar, 2003; DellaVigna and Pollet, 2009; Jin, 2009). The following indicators also need controlling: the size of  $R$ , which

<sup>7</sup> He, X. Q. and Zhou, K. G. (2006), "Synchronisation between Bull and Bear Cycles and Stock Markets", *Management World*, 4: 35-40.

stands for the price momentum that may successively occur (Collins, Gong, and Hribar, 2003; Ali and Gurun, 2009; Barone and Magilke, 2009); *PRICE* and *VOL*, which stand for the limits of arbitrage to some degree (Mashruwala, Rajgopal, and Shevlin, 2006; Barone and Magilke, 2009); and *VOL*, which also reflects investors' devoted attention to the company and the liquidity of its stock in the current period. According to former research findings on the accrual anomaly, we expect the regression coefficients of the three control variables, *B/M*, *E/P*, and *R*, to be positive, while those of *LnMV* and *VOL* should be negative. Since previous research conclusions on the regression coefficient of the control variable *PRICE* are not consistent, no prediction is made herein.

The variables involved in this paper are defined in Table 2.

Table 2 Definitions of Variables

Variable identifier	Variable name	Variable definition
Dependent variable		
<i>RET</i>	Cumulative abnormal return	Value of daily cumulative abnormal return adjusted by size
<i>RET_BETA</i>	Cumulative abnormal return	Value of daily cumulative abnormal return adjusted by risk
<i>RET_MKT</i>	Cumulative abnormal return	Value of daily cumulative abnormal return adjusted by market
Independent variable		
<i>ASSET</i>	Average total assets	Average value of total assets at the beginning and end of the period
<i>EARN</i>	Total earnings	(net profit + financial expense)/average total assets
<i>CFO</i>	Cash flow	Net amount of cash flow from operating activities/average total assets
<i>ACC</i>	Accruals	(total earnings – cash flow)/average total assets
<i>R_CFO</i>	Rank of cash flow	Sorted according to the size of cash flow and equally divided into 10 ranks
<i>R_ACC</i>	Rank of accruals	Sorted according to the size of accruals and equally divided into 10 ranks
<i>WEEK</i>	Different days of a weekly cycle	Takes the value of 1 if the actual disclosure date of earnings is on weekdays, and 0 on weekends.
<i>BULL</i>	Different market conditions	Takes the value of 1 if the actual disclosure date of earnings occurs in a bull market, and 0 in a bear market.
<i>INS</i>	Institutional shareholding ratio	Shareholding ratio of all institutional investors in the latest period
<i>FUN</i>	Fund shareholding ratio	Fund shareholding ratio in the latest period



Variable identifier	Variable name	Variable definition
<i>SEC</i>	Securities trader shareholding ratio	Securities trader shareholding ratio in the latest period
<i>OTH</i>	Shareholding ratio of other institutions	Shareholding ratio of other institutions in the latest period
<i>NUMO</i>	Number of simultaneous announcements	The number of companies simultaneously disclosing earnings announcements on the same day
<i>NUM</i>	Rank of number of simultaneous announcements	Sorted according to the simultaneous number of earnings announcements on the same day and equally divided into 10 ranks
Control variable		
<i>LnMV</i>	Company size	Natural logarithm of market value of equity at the end of half-year <i>t</i>
<i>B/M</i>	Book-to-market ratio	Equity book-to-market ratio of listed company owners at the end of half-year <i>t</i>
<i>E/P</i>	Earnings-price ratio	Ratio between earnings per share and market value per share at the end of half-year <i>t</i>
<i>R</i>	Current return	Rate of cumulative return of the stock at the end of half-year <i>t</i>
<i>PRICE</i>	Stock price	Stock price per share at the end of half-year <i>t</i>
<i>VOL</i>	Turnover rate	Total number of traded shares/total number of circulating shares at the end of half-year <i>t</i>
<i>YEAR</i>	Announcement year	The year when the actual earnings announcement date of a listed company occurs
<i>MONTH</i>	Announcement month	The month when the actual earnings announcement date of a listed company occurs

The models used in this paper are described as follows.

To test Hypothesis 1, we adopt the rational pricing model of Mishkin (1983), which is adopted by Sloan (1996) and most subsequent literature. Simultaneous equations in response to accruals and cash flow are as follows:

$$EARN_{t+1} = \alpha_0 + \alpha_1 \times ACC_t + \alpha_2 \times CFO_t + v_{t+1} \quad (1-1)$$

$$RET_{t+1} = \beta (EARN_{t+1} - \alpha_0 - \alpha_1 \times ACC_t - \alpha_2 \times CFO_t) + \varepsilon_{t+1}, \quad (1-2)$$

where  $EARN_{t+1}$  is the earnings for period  $t+1$ ,  $ACC_t$  the accruals for period  $t$ ,  $CFO_t$  the cash flow for period  $t$ , and  $RET_{t+1}$  the size-adjusted cumulative abnormal returns for the interval from the time of the current earnings announcement to that of the subsequent earnings announcement. We observe the estimated value of the persistence capacity

of accruals and cash flow by Model (1-1), and obtain the market pricing coefficient of accruals and cash flow by Model (1-2), to test whether investors attach functional fixation to total accounting earnings or correctly understand the predictive ability of the persistence of different earnings components in order to forecast future accounting earnings.

To test Hypotheses 2 and 3 in order to examine the influence of different levels of investor attention on the pricing errors of accruals, we use the following model:

$$RET_{t+1} = \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times LnMV_t + \alpha_5 \times B/M_t + \alpha_6 \times E/P_t + \alpha_7 \times R_t + \alpha_8 \times PRICE_t + \alpha_9 \times VOL_t + \varepsilon_{t+1}, \quad (2)$$

where  $RET_{t+1}$  is the size-adjusted abnormal stock return for the interval from the time of the current earnings announcement to that of the subsequent earnings announcement, and  $R\_ACC_t$  is the rank of accruals in period  $t$ .  $WEEK$  stands for the day in a weekly cycle on which current earnings announcements take place, which takes the value of 1 if it is a weekday, and 0 if the weekend. The rest are control variables. The coefficient  $\alpha_2$  reflects the degree of investor pricing errors of accruals in announcement samples on weekends, the coefficient  $\alpha_2 + \alpha_3$  measures the same on weekdays, and the coefficient  $\alpha_3$  of the interaction term reflects the influence of different levels of investor attention on such pricing errors.

## V. Analysis of Empirical Results

### 5.1 Descriptive Statistics

Considering the distribution characteristics of investor attention devoted to earnings information, we use weekend as the day on which investors focus their attention, and weekday as the day on which they are distracted, and divide the samples into five groups expressed as  $Q\_ACC$  according to size of accruals.<sup>8</sup>  $Q\_ACC$  equals 1 is the group of minimum accruals, and  $Q\_ACC$  equals 5 is the group of maximum accruals. Table 3 provides descriptive statistics of key variables in response to two subsamples of earnings disclosed on weekends and on weekdays.<sup>9</sup> Because the two groups of samples have

<sup>8</sup> We adopt quintile subdivision in descriptive statistics and tenths subdivision in empirical analysis. We primarily consider that although the tenths subdivision is more helpful in showing the difference between groups of different ranks, this method can simultaneously lead to less quantity in each group of samples. The difference in company size and book-to-market ratio is larger between groups of different ranks, which may influence the rate of return. We cannot, however, control for these factors in descriptive statistics, and the estimated undulatory property increases (Collins and Hribar, 2000). We increase sample quantity in each group using the quintile subdivision method to strengthen estimated stability and accuracy and enhance the explanatory ability of testing (DellaVigna and Pollet, 2009). Such practice is also similar to literature such as Collins and Hribar (2000) and Mashruwala, Rajgopal, and Shevlin (2006). Moreover, we also adopt the tenths method and obtain similar results.

<sup>9</sup> Reviewers of this paper point out that it is exogenous for us to assume whether earnings are disclosed on weekends, but it is a strategic issue about when to disclose earnings. Therefore, enterprises with earnings announced on Saturdays may have different features from others. Table 3 shows the difference between these enterprises and other enterprises, but other factors may not be considered, leading to doubt whether the result is due to exogenous influence. We think that exogenous problems in fact exist widely in similar research and cannot be avoided. For example, DellaVigna and Pollet (2009) find that companies with earnings information disclosed on Fridays and non-Fridays differ to some degree in company features, such as size and book-to-market ratio. Hirshleifer, Lim, and Teoh (2009) find that corporate characteristics differ to some degree between companies with more and with fewer information disclosures. They enter control variables that stand for different company features in regression equations to weaken exogenous influences. We follow their method and select some control variables based on the descriptive statistics in Table 3, and add them into the regression equations so as to eliminate exogenous influences as much as possible.

certain differences in such indicators as size and book-to-market ratio, we control for these factors in the follow-up tests. From the perspective of time series, earnings in the two groups trend downwards, while from the perspective of earnings components, the proportion of accruals in total earnings is lower than that of cash flow. Companies with weekend announcements have smaller total earnings and cash flow than those with weekday announcements, and the differences are remarkable; accruals of the former are larger than those of the latter, but the difference is not significant.

**Table 3** Descriptive Statistics of Key Variables

	$LnMV_t$	$B/M_t$	$E/P_t$	$R_t$	$PRICE_t$	$VOL_t$
Weekday	7.74	0.38	0.04	-0.04	10.06	0.49
Weekend	7.61	0.42	0.04	-0.06	9.01	0.50
Difference	0.13***	-0.04***	0.00**	0.02***	1.05***	-0.01
T value	6.86	-6.43	2.43	3.35	7.49	-1.14

**Table 3** Descriptive Statistics of Key Variables (Continued)

	$EARN_t$	$ACC_t$	$CFO_t$	$EARN_{t+1}$	$RET_{t+1}$	$N$
Weekday	0.0574	0.0007	0.0571	0.0431	-0.0079	9087
Weekend	0.0483	0.0037	0.0452	0.0330	-0.0166	2263
Difference	0.0091***	-0.0030	0.0119***	0.0101***	0.0087*	
T value	11.40	-1.58	5.92	8.57	1.83	

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

Table 4 provides the distribution of companies with weekday announcements and weekend announcements in each group of accruals, including the mean value of accruals, frequency distribution, and the respective proportions of the two groups of sample companies in every quintile group.

**Table 4** Size of Accruals and Frequency Distribution of Companies with Weekday Announcements and Weekend Announcements in Each Rank

	$Q\_ACC$	1 (Bottom)	2	3	4	5 (Top)
All	Mean value	-0.1041	-0.0344	-0.0015	0.0315	0.1148
	N	2264	2271	2276	2271	2268
Weekday	Mean value	-0.1031	-0.0339	-0.0008	0.0321	0.1152
	N	1864	1831	1804	1822	1766
	Proportion	0.82	0.81	0.79	0.80	0.78
Weekend	Mean value	-0.1087	-0.0366	-0.0042	0.0290	0.1134
	N	400	440	472	449	502
	Proportion	0.18	0.19	0.21	0.20	0.22

From Table 4, we find that earnings announcements are evenly distributed in a weekly cycle. The two groups of companies have similar frequency distributions in each rank, further demonstrating that the two groups have no systematic differences.

Meanwhile, their mean values of accruals are very similar in each rank without notable differences, demonstrating that the different investor responses to weekday and weekend announcements do not result from the different size of accruals between the two groups of companies.

When the economic consequences of pricing errors are studied, samples are usually grouped according to the size of accruals for analysing investment portfolios. A hedging trading strategy includes purchasing stocks with low accruals and selling short stocks with high accruals, where the balance of abnormal returns in a certain period is the abnormal investment return of the hedging investment portfolio. If the abnormal return of this strategy obviously differs from 0, it can be inferred that investors have made errors in evaluating the persistence of accruals, resulting in a wrong value judgment of stocks, or in other words, market inefficiency. Table 5-1 reports the relation between the size of accruals and cumulative abnormal returns in the whole sample interval, of which Panels A, B, and C provide the test results of the entire sample, weekday announcement sample, and weekend announcement sample, respectively. Panel D provides the difference in cumulative abnormal returns between the weekday and weekend announcement samples with regard to the size of accruals of the same rank, representing the relation between different levels of investor attention and investor capacity to price accruals. A difference in the values of cumulative abnormal returns between  $Q\_ACC5$  and  $Q\_ACC1$  in every subsample stands for the abnormal return of hedging the investment portfolio. A negative difference indicates that investors are unable to recognise the low persistence of accruals, and a bigger negative difference stands for a higher level of pricing error. We find from Panel A of Table 5-1 that the cumulative abnormal return after earnings announcements sharply decreases as the size of accruals increases, demonstrating that investors overestimate the persistence of accruals, resulting in pricing errors. Such a phenomenon similarly exists in the subsample with earnings disclosed on weekdays, but not in the subsample with earnings disclosed on weekends, which can be proved by the difference in values between  $Q\_ACC5$  and  $Q\_ACC1$  in Panel B, which obviously differs from 0, while the difference in Panel C does not. Hypotheses 1 and 2 are thus preliminarily tested.

**Table 5-1** Comparison of Cumulative Abnormal Returns in Different Accrual Ranks — Full Sample Interval

$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	Full sample	Weekday	Weekend	Difference
1 (Bottom)	0.0037	0.0077	-0.0151	0.0228** (2.32)
2	0.0020	0.0049	-0.0101	0.0151* (1.71)
3	-0.0080	-0.0048	-0.0205	0.0157 (1.53)
4	-0.0175	-0.0178	-0.0163	-0.0015 (-0.14)
5 (Top)	-0.0285	-0.0308	-0.0203	-0.0105 (-1.00)
$Q\_ACC5 - Q\_ACC1$	-0.0321*** (-5.35)	-0.0385*** (-5.68)	-0.0051 (-0.39)	

**Table 5-2** Comparison of Cumulative Abnormal Returns in Different Accrual Ranks —  
In a Bull Market

$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	Full sample	Weekday	Weekend	Difference
1 (Bottom)	0.0025	0.0073	-0.0198	0.0272** (1.95)
2	0.0021	0.0059	-0.0135	0.0194* (1.74)
3	-0.0070	-0.0029	-0.0231	0.0202** (2.04)
4	-0.0140	-0.0131	-0.0181	0.0050 (0.30)
5 (Top)	-0.0310	-0.0361	-0.0128	-0.0233** (-1.96)
$Q\_ACC5 - Q\_ACC1$	-0.0336*** (-3.82)	-0.0434*** (-4.43)	0.0071 (0.36)	

**Table 5-3** Comparison of Cumulative Abnormal Return in Different Accrual Ranks —  
In a Bear Market

$Q\_ACC$	Panel A	Panel B	Panel C	Panel D
	Full sample	Weekday	Weekend	Difference
1 (Bottom)	0.0052	0.0082	-0.0088	0.0170 (1.15)
2	0.0018	0.0037	-0.0056	0.0093 (0.68)
3	-0.0094	-0.0072	-0.0172	0.0100 (0.76)
4	-0.0219	-0.0240	-0.0143	-0.0097 (-0.78)
5 (Top)	-0.0252	-0.0240	-0.0292	0.0052 (0.40)
$Q\_ACC5 - Q\_ACC1$	-0.0304*** (-3.89)	-0.0322*** (-3.60)	-0.0204 (-1.27)	

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

As shown by Tables 5-2 and 5-3, investor attention has a different influence on pricing errors of accruals between bull and bear markets. We see from Panels B and C that regardless of market conditions, pricing errors of accruals are always found in samples of weekday earnings announcements but never in those of weekend announcements. Because market conditions can differently influence the size of abnormal returns, we attach more importance to the comparison of the results of Panel D between Tables 5-2 and 5-3, namely the influence of different levels of investor attention at different days of the weekly cycle on reading efficiency in a bull and in a bear market. We find that these different levels have an exceptional influence on accrual pricing in four of the five ranked groups of accruals in a bull market, whereas investor attention has a weakened influence on pricing capacity in a bear market. This is demonstrated by the fact that such influence is not significant in all five groups of accruals, and the difference in influence is not significant even in the extreme-rank groups. The results of

Panel D thus show that investor attention has a stronger influence on pricing capacity in a bull market, providing preliminary test evidence for Hypothesis 3.

Taking Table 5-1 as an example, Figure 1 compares more intuitively the differences in investor responses to weekday and weekend announcements, namely the influence of investor attention on the pricing of earnings components. It shows a very strong linear relation between abnormal returns and accruals after earnings announcements with respect to weekday announcement samples; abnormal returns sharply decrease as the size of accruals increases, demonstrating that investors do not fully read earnings information in weekday announcements, thus resulting in pricing errors. There is, however, no obvious linear relation between abnormal returns and accruals with respect to weekend announcement samples and the trend change is very mild, so we can presume that investors correctly read the information of earnings components in weekend announcements.

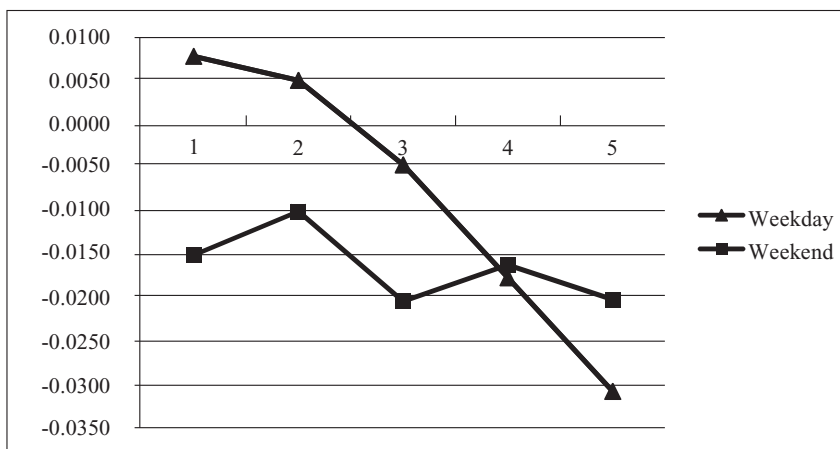


Figure 1 Influence of Investor Attention on Pricing Errors

## 5.2 Results and Analysis of Empirical Tests

We use the method of yearly regression and the summary of Fama-MacBeth (1973), and adopt Models (1-1) and (1-2) to test respectively the samples of weekday and weekend announcements. In accordance with former research, the persistence of accruals is lower than that of cash flow, which is shown as  $\alpha_1 < \alpha_2$  in the models. The core of the accrual anomaly is that there is no obvious difference in the pricing coefficients of accruals and cash flow, which can be demonstrated in specific parameters of the models, namely  $\alpha_1^* = \alpha_2^*$ . To test whether obvious pricing errors exist in the market, we need to test  $\alpha_1 = \alpha_1^*$  and  $\alpha_2 = \alpha_2^*$ . Tables 6-1, 6-2, and 6-3 successively provide the test results of the full sample, the first half-year sample, and the second half-year sample.

**Table 6-1** Influence of Different Levels of Investor Attention on Earnings Components  
— Full Sample

Panel A			Panel B		
Fama-MacBeth test on weekday announcement samples			Fama-MacBeth test on weekend announcement samples		
Parameter	Estimated value	T value	Parameter	Estimated value	T value
$\alpha_1$	0.7008***	12.14	$\alpha_1$	0.7357***	12.65
$\alpha_1^*$	0.7349***	3.67	$\alpha_1^*$	0.5198*	1.79
$\alpha_2$	0.7649***	13.38	$\alpha_2$	0.7839***	13.13
$\alpha_2^*$	0.6807***	3.80	$\alpha_2^*$	0.5556*	1.86
$\beta$	1.7009***	7.31	$\beta$	1.3423***	4.28
Test: $\alpha_1 = \alpha_2$ 11.28*** <sup>10</sup>			Test: $\alpha_1 = \alpha_2$ 3.21**		
Test: $\alpha_1 = \alpha_1^*$ 7.80***			Test: $\alpha_1 = \alpha_1^*$ 1.87		
Test: $\alpha_2 = \alpha_2^*$ 10.10***			Test: $\alpha_2 = \alpha_2^*$ 1.93		

**Table 6-2** Influence of Different Levels of Investor Attention on Earnings Components  
— First Half-Year Sample

Panel A			Panel B		
Fama-MacBeth test on weekday announcement samples			Fama-MacBeth test on weekend announcement samples		
Parameter	Estimated value	T value	Parameter	Estimated value	T value
$\alpha_1$	0.6073***	6.56	$\alpha_1$	0.6806***	7.24
$\alpha_1^*$	0.6412**	3.69	$\alpha_1^*$	0.4782*	1.87
$\alpha_2$	0.6720***	7.16	$\alpha_2$	0.7171***	8.46
$\alpha_2^*$	0.5940***	4.66	$\alpha_2^*$	0.5111*	1.92
$\beta$	1.4841***	6.77	$\beta$	1.2348**	2.91
Test: $\alpha_1 = \alpha_2$ 12.73***			Test: $\alpha_1 = \alpha_2$ 2.75*		
Test: $\alpha_1 = \alpha_1^*$ 7.99***			Test: $\alpha_1 = \alpha_1^*$ 1.70		
Test: $\alpha_2 = \alpha_2^*$ 11.49***			Test: $\alpha_2 = \alpha_2^*$ 1.85		

**Table 6-3** Influence of Different Levels of Investor Attention on Earnings Components  
— Second Half-Year Sample

Panel A			Panel B		
Fama-MacBeth test on weekday announcement samples			Fama-MacBeth test on weekend announcement samples		
Parameter	Estimated value	T value	Parameter	Estimated value	T value
$\alpha_1$	0.7827***	12.34	$\alpha_1$	0.7840***	10.72
$\alpha_1^*$	0.8169**	3.22	$\alpha_1^*$	0.5563*	1.84
$\alpha_2$	0.8462***	14.05	$\alpha_2$	0.8424***	10.12
$\alpha_2^*$	0.7567**	3.32	$\alpha_2^*$	0.5946*	1.93
$\beta$	1.8907***	4.37	$\beta$	1.4364***	5.17
Test: $\alpha_1 = \alpha_2$ 10.00***			Test: $\alpha_1 = \alpha_2$ 3.70**		
Test: $\alpha_1 = \alpha_1^*$ 7.63***			Test: $\alpha_1 = \alpha_1^*$ 1.96		
Test: $\alpha_2 = \alpha_2^*$ 8.89***			Test: $\alpha_2 = \alpha_2^*$ 1.98		

<sup>10</sup> The statistics and significance of  $\chi^2$  in the likelihood ratio test.

As Table 6-1 shows, the persistence coefficient of accruals is 0.7008, while the pricing coefficient of the market is 0.7349 for the subsample of earnings information in weekday announcements, meaning that accruals are overestimated, and the difference is significant at the 1 per cent level. At the same time, the persistence coefficient of cash flow is 0.7649 while the pricing coefficient of the market is 0.6807, meaning that cash flow is underestimated, and the difference is also significant at the 1 per cent level. Meanwhile, the market gives accruals a valuation coefficient of 0.7349 and cash flow a valuation coefficient of 0.6807, demonstrating that investors do not realise that the actual persistence of accruals is lower than that of cash flow, and they have made wrong judgments in pricing. Therefore, pricing errors of earnings components obviously exist in the subsamples of weekday earnings announcements. For the subsample of weekend earnings announcements, the persistence coefficient of cash flow is 0.7839 and that of accruals is 0.7357; the former is thus higher than the latter with a significant difference. From the market's perspective, investors provide cash flow a valuation coefficient of 0.5556, which is higher than 0.5198, the valuation coefficient given to accruals, illustrating that the market considers the difference between accruals and cash flow in persistence at the time of pricing and thus prices differently the different earnings components. But the valuation coefficients of cash flow and accruals are all lower than their persistence coefficients, possibly because of investors' overly conservative pricing for weekend earnings, but these differences are not statistically significant. In other words, the Mishkin test is unable to reject the null hypothesis  $\alpha_1 = \alpha_1^*$  and  $\alpha_2 = \alpha_2^*$ , and so the null hypothesis that pricing errors of earnings components do not exist in the market cannot be rejected for the subsample of weekend earnings announcements. Hypothesis 1 is thus tested and proved. Moreover, the valuation coefficient decreases from 0.7349 on weekdays to 0.5198 on weekends in respect of investor valuation of accruals, with a 29 per cent range of variation, while the valuation coefficient decreases from 0.6807 on weekdays to 0.5556 on weekends in respect of investor valuation of cash flow, with an 18 per cent range of variation. It is thus clear that different levels of investor attention have more influence on accrual pricing than on cash flow pricing when earnings components are priced. Compared with cash flow, it is more difficult to read accruals, and so investors need greater cognitive resources to read accruals and their attention has more influence on accrual pricing.

Tables 6-2 and 6-3 are similar to Table 6-1 in test results, demonstrating that the accrual anomaly exists not only in the annual but also in the interim reports in the Chinese securities markets. Meanwhile, notable pricing errors of earnings components are observed in the weekday announcement samples, whereas obvious pricing errors are not found in the weekend samples. Investor attention thus influences the reading efficiency of both interim and annual reports.

Considering that other factors may influence the attention and valuation of investors, we take accruals as an example and conduct multiple regressions to test the influence



of different investor attention levels on the pricing errors of earnings components. We sort all samples from small to large in accordance with the size of accruals and divide them into 10 groups, which are expressed as  $R\_ACC$ . We mix sectional data and time series data in the sample period to obtain the panel data and conduct the test. We adopt panel data to conduct the regression analysis since this could effectively improve the estimated accuracy of the time series models and better check for autocorrelation and heteroscedasticity. The Hausman test results of our sample data support the fixed-effect model.

We first test the fundamental phenomenon that investors make pricing errors on accruals, and the relevant results are reported in Table 7. Adding control variables greatly enhance the significance and goodness of fit of the whole regression equation, demonstrating that the control variables we select are reasonable. The results show that pricing errors of accruals exist in the market regardless of the samples of interim or annual reports. In other words, investors are unable to recognise the low persistence of accruals, and so companies with higher current accruals will have lower cumulative abnormal returns, and vice versa. Meanwhile, the signs of the regression coefficients of the control variables also conform to expectations.

**Table 7** Accruals and Pricing Errors

Dependent variable: $RET$	Panel Data Regression					
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	First half-year	Second half-year	Full sample	First half-year	Second half-year
Constant	-0.0049 (-0.69)	-0.0047 (-0.60)	-0.0046 (-0.60)	-0.0254 (-1.06)	-0.0172 (-0.50)	-0.0293 (-0.92)
$R\_ACC$	<b>-0.0378***</b> <b>(-6.37)</b>	<b>-0.0369***</b> <b>(-4.14)</b>	<b>-0.0385***</b> <b>(-4.84)</b>	<b>-0.0314***</b> <b>(-5.23)</b>	<b>-0.0303***</b> <b>(-3.39)</b>	<b>-0.0313***</b> <b>(-3.89)</b>
$LnMV$				-0.0031 (-1.07)	-0.0074* (-1.75)	0.0007 (0.20)
$B/M$				0.0400*** (3.33)	0.0209 (1.16)	0.0558*** (3.47)
$E/P$				0.4430*** (5.24)	1.0788*** (8.76)	-0.0615 (-0.53)
$R$				0.0819*** (7.26)	0.0607*** (3.83)	0.1066*** (6.70)
$PRICE$				-0.0008 (-1.58)	0.0007 (0.99)	-0.0020*** (-3.05)
$VOL$				-0.0247*** (-4.18)	-0.0300*** (-3.40)	-0.0232*** (-2.91)
$YEAR$	X	X	X	X	X	X
$MONTH$	X	X	X	X	X	X
N	11350	4771	6579	11350	4771	6579
Adj.R <sup>2</sup> (%)	0.65	0.46	0.74	1.65	2.73	1.71
F	2.36***	0.81	3.64***	5.20***	3.65***	6.33***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Table 8 reports the influence of investor attention on pricing errors of accruals in respect of the full sample, sample of interim reports, and sample of annual reports. The results show that earnings information can be correctly read in the sample of weekend earnings announcements without pricing errors of accruals because investors have devoted greater attention and cognitive resources; this is shown in the insignificant coefficient of  $R\_ACC$ , which stands for the relation between cumulative abnormal returns after announcements and accruals. But in the sample of weekday earnings announcements, because investors are distracted and their capacity to read information decreases, they are unable to recognise correctly the different components of total earnings, thus resulting in pricing errors, as shown by the fact that the sum of the coefficients of  $R\_ACC$  and of the interaction term  $WEEK*R\_ACC$  obviously differs from 0. The coefficient of the latter measures the influence of the attention devoted by investors to earnings information on their capacity to read information. Since the coefficient of the interaction term is obviously negative, investors are more distracted, and pricing errors are more serious. Hypothesis 2 is thus tested and proved.

**Table 8** Influence of Different Levels of Investor Attention on Pricing Errors of Accruals

Dependent variable: $RET$	Panel Data Regression					
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	First half-year	Second half-year	Full sample	First half-year	Second half-year
$Constant$	-0.0276*** (-2.72)	-0.0321** (-2.35)	-0.0242** (-1.99)	-0.0438* (-1.77)	-0.0371 (-1.04)	-0.0460 (-1.40)
$WEEK$	0.0282*** (3.13)	0.0334** (2.43)	0.0245** (2.07)	0.0252*** (2.81)	0.0278** (2.02)	0.0226** (1.91)
$R\_ACC$	<b>-0.0066</b> <b>(-0.49)</b>	<b>-0.0020</b> <b>(-0.09)</b>	<b>-0.0094</b> <b>(-0.54)</b>	<b>-0.0023</b> <b>(-0.17)</b>	<b>0.0023</b> <b>(0.11)</b>	<b>-0.0046</b> <b>(-0.26)</b>
$WEEK*R\_ACC$	<b>-0.0387***</b> <b>(-2.60)</b>	<b>-0.0423*</b> <b>(-1.84)</b>	<b>-0.0365*</b> <b>(-1.87)</b>	<b>-0.0362**</b> <b>(-2.45)</b>	<b>-0.0398*</b> <b>(-1.75)</b>	<b>-0.0337*</b> <b>(-1.73)</b>
$LnMV$				-0.0033 (-1.16)	-0.0078* (-1.83)	0.0006 (0.15)
$B/M$				0.0405*** (3.37)	0.0218 (1.21)	0.0560*** (3.48)
$E/P$				0.4359*** (5.15)	1.0702*** (8.67)	-0.0668 (-0.58)
$R$				0.0816*** (7.23)	0.0606*** (3.83)	0.1060*** (6.67)

Dependent variable: <i>RET</i>	Panel Data Regression					
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	First half-year	Second half-year	Full sample	First half-year	Second half-year
<i>PRICE</i>				-0.0008 (-1.58)	0.0006 (0.97)	-0.0020*** (-3.04)
<i>VOL</i>				-0.0246*** (-4.15)	-0.0298*** (-3.37)	-0.0231*** (-2.90)
<i>YEAR</i>	X	X	X	X	X	X
<i>MONTH</i>	X	X	X	X	X	X
N	11350	4771	6579	11350	4771	6579
Adj. R <sup>2</sup> (%)	0.73	0.59	0.80	1.72	2.82	1.77
F	2.39***	0.76	3.69***	5.21***	3.66***	6.32***
$\alpha_2 + \alpha_3 = 0$	46.35***	20.08***	26.32***	32.92***	14.28***	17.88***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Table 9 reports the influence of investor attention on pricing errors of accruals under different market conditions in respect of the full sample, the interim report sample, and the annual report sample. For companies disclosing earnings information on weekends, pricing errors of accruals do not occur whether the market is bullish or bearish, as shown in the insignificant coefficient of *R\_ACC*, which stands for the relation between cumulative abnormal returns after announcements and accruals. The coefficient, however, is positive in a bull market; in other words, higher *ACC* leads to higher returns. We think that this is related to market conditions. When sentiment is overheated in a bull market, investors are in high spirits such that prices of different stocks rise successively, so the overall yield of the market is relatively high. As a result, the market gives a higher price to a company with higher accruals. But the fact that it is not statistically significant shows that obvious mispricing of accruals does not happen even in a bull market for earnings information disclosed on weekends. For companies with information disclosed on weekdays, pricing errors of accruals occur whether the market is bullish or bearish, as shown by the fact that the sum of the coefficients of *R\_ACC* and of the interaction term *WEEK\*R\_ACC* is significantly negative. But the influence of different levels of investor attention on pricing errors is demonstrated only in a bull market, since the coefficient of *WEEK\*R\_ACC* is significantly negative in a bull market but not significant in a bear market; this demonstrates that the influence of investor attention on pricing errors for the whole sample interval is driven mainly by a bull market. Hypothesis 3 is thus tested and proved.

**Table 9** Influence of Investor Attention on Pricing Errors of Accruals under Different Market Conditions — Panel Data

Dependent variable: <i>RET</i>	Full sample		First half-year sample		Second half-year sample	
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	In a bull market	In a bear market	In a bull market	In a bear market	In a bull market	In a bear market
Constant	-0.0346 (-0.95)	-0.0076 (-0.24)	0.0173 (0.21)	-0.0393 (-1.02)	-0.0599 (-1.47)	0.0378 (0.74)
<i>WEEK</i>	0.0356*** (2.70)	0.0138 (1.21)	0.0776** (2.22)	0.0117 (0.85)	0.0255* (1.82)	0.0164 (0.80)
<i>R_ACC</i>	<b>0.0122</b> <b>(0.62)</b>	<b>-0.0162</b> <b>(-0.97)</b>	<b>0.0764</b> <b>(1.45)</b>	<b>-0.0191</b> <b>(-0.94)</b>	<b>-0.0011</b> <b>(-0.05)</b>	<b>-0.0129</b> <b>(-0.45)</b>
<i>WEEK*R_ACC</i>	<b>-0.0520**</b> <b>(-2.38)</b>	<b>-0.0191</b> <b>(-1.03)</b>	<b>-0.1276**</b> <b>(-2.19)</b>	<b>-0.0121</b> <b>(-0.54)</b>	<b>-0.0352*</b> <b>(-1.71)</b>	<b>-0.0327</b> <b>(-0.99)</b>
<i>LnMV</i>	-0.0010 (-0.24)	-0.0072** (-2.00)	-0.0162* (-1.66)	-0.0061 (-1.37)	0.0038 (0.81)	-0.0104 (-1.64)
<i>B/M</i>	0.0305* (1.76)	0.0608*** (3.84)	-0.0095 (-0.27)	0.0461** (2.17)	0.0504** (2.50)	0.0774*** (3.21)
<i>E/P</i>	0.0961 (0.80)	0.9225*** (8.16)	0.6530*** (2.78)	1.4312*** (9.73)	-0.1941 (-1.35)	0.2396 (1.35)
<i>R</i>	0.0792*** (5.10)	0.0918*** (5.72)	0.0109 (0.35)	0.1013*** (5.42)	0.1090*** (5.97)	0.0708** (2.15)
<i>PRICE</i>	-0.0018*** (-2.73)	0.0010 (1.61)	0.0014 (0.88)	0.0008 (1.20)	-0.0027*** (-3.57)	0.0027* (1.72)
<i>VOL</i>	-0.0262*** (-3.06)	-0.0257*** (-3.32)	-0.0463** (-2.46)	-0.0253*** (-2.63)	-0.0208** (-2.15)	-0.0278** (-2.12)
<i>YEAR</i>	X	X	X	X	X	X
<i>MONTH</i>	X	X	X	X	X	X
N	6427	4923	1281	3490	5146	1433
Adj. R <sup>2</sup> (%)	1.47	3.88	2.21	4.88	1.77	3.81
F	3.63***	2.13**	2.39*	2.65**	5.37***	3.45**
$\alpha_2 + \alpha_3 = 0$	16.26***	17.26***	4.13**	9.96***	11.68***	7.71***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

## VI. Sensitivity Analysis

### 6.1 Changing the Method of Computing Cumulative Abnormal Returns

To test whether the results of this paper are influenced by the method of computing

abnormal returns, we calculate these with the market-adjusted and risk-adjusted methods.

We obtain the market-adjusted abnormal return by subtracting the rate of return of the market portfolio from the actual rate of return for a certain stock in a certain period. For half-year or year  $t$ , the market-adjusted cumulative rate of abnormal return of stock  $k$  for the period  $[t+h, t+H]$  can be expressed as follows:

$$RET\_MKT_{t,k}^{(h,H)} = [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,k}) - 1] - [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,m}) - 1],$$

where  $R_{j,k}$  refers to the actual rate of return of stock  $k$  on day  $j$ ,  $R_{j,m}$  the market capitalisation-weighted average market return of A shares in the two stock markets on day  $j$ , and  $\tau$  the disclosure date of the actual earnings of individual stocks in half-year or year  $t$ .

In turn we obtain the risk-adjusted abnormal return by subtracting the risk (beta coefficient)-adjusted rate of return from the actual rate of return for a certain stock in a certain period. The beta coefficient of individual stock  $k$  in half-year or year  $t$  is obtained mainly in accordance with the regression of individual stock returns to market returns within  $[-300, -46]$ <sup>11</sup> days before the earnings announcement:

$$R_{u,k} = \alpha_{t,k} + \beta_{t,k} \times R_{u,m},$$

where  $R_{u,k}$  refers to the yield of individual stock  $k$  on day  $u$ ,  $R_{u,m}$  to the market capitalisation-weighted average market return of A shares in the two stock markets on day  $u$ ,  $\tau$  to the disclosure date of actual earnings of individual stocks in half-year or year  $t$ , and  $u$  to the interval of  $[-300, -46]$  before the earnings announcement day.

For half-year or year  $t$ , the risk-adjusted cumulative rate of the abnormal return of stock  $k$  in the period  $[t+h, t+H]$  can be expressed as

$$RET\_META_{t,k}^{(h,H)} = [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,k}) - 1] - \beta_{t,k} \times [\prod_{j=\tau+h}^{\tau+H} (1 + R_{j,m}) - 1],$$

where  $R_{j,k}$  refers to the actual rate of return of stock  $k$  on day  $j$ ,  $R_{j,m}$  to the market capitalisation-weighted average market return of A shares in the two stock markets on day  $j$ ,  $\beta_{t,k}$  to the beta coefficient of individual stocks, and  $\tau$  to the disclosure date of actual earnings of individual stocks in half-year or year  $t$ .

Table 10 reports the influence of investor attention on pricing errors of accruals when cumulative abnormal returns are respectively calculated through the market-adjusted and risk-adjusted methods. For companies disclosing earnings information on weekends, pricing errors of accruals occur regardless of the computing method of abnormal returns or whether the market is bullish or bearish or during the full sample period, as shown by the insignificant coefficient of  $R\_ACC$ . For companies with earnings

<sup>11</sup> The interval is confirmed mainly in accordance with the practice of DellaVigna and Pollet (2009).

information disclosed on weekdays, pricing errors occur significantly in respect of different computing methods and computing intervals, as shown by the fact that the sum of the coefficients of  $R\_ACC$  and of the interaction term  $WEEK*R\_ACC$  differ significantly from 0. Moreover, the coefficient of  $WEEK*R\_ACC$ , which reflects the influence of different levels of investor attention on pricing errors, differs significantly from 0 in a bull market though not significantly in a bear market, indicating that the influence of investor attention on pricing errors is demonstrated mainly in a bull market. Therefore, the major findings of this paper are not influenced by the computing method of cumulative abnormal returns.

**Table 10** Influence of Different Levels of Investor Attention on Pricing Errors of Accruals — Panel Data

Dependent variable: $RET$	Market-adjusted method			Risk-adjusted method		
	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	In a bull market	In a bear market	Full sample	In a bull market	In a bear market
Constant	0.0552** (2.20)	0.2078*** (5.68)	-0.1105*** (-3.40)	0.0261 (1.02)	0.1633*** (4.34)	-0.1060*** (-3.19)
$WEEK$	0.0286*** (3.14)	0.0417*** (3.16)	0.0131 (1.13)	0.0291*** (3.13)	0.0423*** (3.12)	0.0140 (1.19)
$R\_ACC$	<b>0.0001</b> <b>(0.01)</b>	<b>0.0156</b> <b>(0.79)</b>	<b>-0.0146</b> <b>(-0.87)</b>	<b>0.0016</b> <b>(0.11)</b>	<b>0.0153</b> <b>(0.76)</b>	<b>-0.0121</b> <b>(-0.71)</b>
$WEEK$ $*R\_ACC$	<b>-0.0430***</b> <b>(-2.88)</b>	<b>-0.0602***</b> <b>(-2.74)</b>	<b>-0.0212</b> <b>(-1.13)</b>	<b>-0.0450***</b> <b>(-2.94)</b>	<b>-0.0618***</b> <b>(-2.74)</b>	<b>-0.0241</b> <b>(-1.25)</b>
$LnMV$	-0.0049* (-1.70)	-0.0235*** (-5.51)	0.0184*** (5.07)	-0.0050* (-1.71)	-0.0193*** (-4.40)	0.0128*** (3.46)
$B/M$	0.0499*** (4.10)	0.0451*** (2.61)	0.0629*** (3.92)	0.0485*** (3.90)	0.0307* (1.72)	0.0770*** (4.71)
$E/P$	0.4082*** (4.77)	0.0611 (0.51)	0.8871*** (7.76)	0.4235*** (4.84)	0.1508 (1.21)	0.7970*** (6.84)
$R$	0.1040*** (9.13)	0.1045*** (6.71)	0.0989*** (6.09)	0.1143*** (9.81)	0.1288*** (8.04)	0.0896*** (5.41)
$PRICE$	-0.0011** (-2.34)	-0.0022*** (-3.29)	0.0010 (1.53)	-0.0012** (-2.53)	-0.0027*** (-3.88)	0.0011* (1.69)
$VOL$	-0.0134** (-2.23)	-0.0133 (-1.55)	-0.0262*** (-3.35)	-0.0167*** (-2.73)	-0.0299*** (-3.39)	-0.0085 (-1.06)
$YEAR$	X	X	X	X	X	X
$MONTH$	X	X	X	X	X	X
N	11350	6427	4923	11350	6427	4923
Adj. $R^2$ (%)	4.12	3.96	7.07	3.34	3.46	5.08
$F$	15.14***	7.65***	8.62***	12.24***	8.71***	6.09***
$\alpha_2 + \alpha_3 = 0$	40.06***	20.32***	17.37***	39.16***	20.83***	17.03***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

## 6.2 Difference in Attention Levels between Different Kinds of Investors

Institutional investors<sup>12</sup> receive more systematic training, and thus compared with individual investors they are equipped with relatively stronger research and development strength, and they enjoy information dominance, financial strength, and professional advantage in obtaining and applying public information. In addition, the regular work of institutional investors is to analyse and read earnings announcements disclosed by enterprises, and so we expect that their attention will have different influences on different kinds of investors in the decision-making process.

Since the institutional shareholding data from the WIND database are collected only as of 2004, we separately select such data between 2001 and 2003 from the RESSET database. Ryan and Schneider (2002) and Chen, Harford, and Li (2007) point out that different institutional investors have different levels of “shareholder activism”, and only those institutions having independent business relations with listed companies, holding shares of the companies for over one year, and bulk-holding shares are able to monitor companies and influence important company decisions. Other kinds of institutional investors are not equipped with the monitoring role. Yao and Liu (2009) find that compared with securities traders, funds are more marketised in terms of operating mechanisms; they also have higher incentive and restraint mechanisms and stronger independence, so that their monitoring role far surpasses that of securities traders, and the behaviour of funds becomes more rational. Different kinds of institutional investors have different levels of attention and monitoring roles for companies. Considering that funds account for over 80 per cent of all institutional investors, they are the major constituent of institutional investors and have much higher shareholding ratios than securities traders.<sup>13 14</sup> We therefore classify all institutional investors into three categories—funds, securities traders, and other institutional investors—and respectively test these categories to analyse whether institutions with bulk-holding shares pay more attention to their invested companies. Consequently, different levels of attention on various days of a weekly cycle have a weakened influence on information reading.

We successively adopt the following models to test the influence of investor attention on the decision-making of various kinds of investors:

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times INS_t \\
 & + \alpha_5 \times INS_t \times R\_ACC_t + \alpha_6 \times INS_t \times WEEK \times R\_ACC_t + \alpha_7 \times LnMV_t \\
 & + \alpha_8 \times B/M_t + \alpha_9 \times E/P_t + \alpha_{10} \times R_t + \alpha_{11} \times PRICE_t + \alpha_{12} \times VOL_t + \varepsilon_{t+1}, \quad (3)
 \end{aligned}$$

<sup>12</sup> We herein mean institutional investors in the broad sense, including all institutional investors, such as funds, securities traders, insurance companies, social security funds, and trust companies.

<sup>13</sup> Hou, Y. and Ye, D., (2008), "Institutional Investors, Insider Transactions, and Market Efficiency", *Financial Research* 4: 131-145.

<sup>14</sup> Yao, Y. and Liu, Z., (2009), "Do Institutional Investors Have a Monitoring Role?", *Financial Research* 6: 128-143.

where for tests of funds, securities traders, and other institutional investors, the variable *INS* is substituted by *FUN*, *SEC*, and *OTH*, respectively.

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times FUN_t \\
 & + \alpha_5 \times FUN_t \times R\_ACC_t + \alpha_6 \times FUN_t \times WEEK \times R\_ACC_t + \alpha_7 \times SEC_t \\
 & + \alpha_8 \times SEC_t \times R\_ACC_t + \alpha_9 \times SEC_t \times WEEK \times R\_ACC_t + \alpha_{10} \times OTH_t \\
 & + \alpha_{11} \times OTH_t \times R\_ACC_t + \alpha_{12} \times OTH_t \times WEEK \times R\_ACC_t + \alpha_{13} \times LnMV_t \\
 & + \alpha_{14} \times B/M_t + \alpha_{15} \times E/P_t + \alpha_{16} \times R_t + \alpha_{17} \times PRICE_t + \alpha_{18} \times VOL_t + \varepsilon_{t+1} \quad (4)
 \end{aligned}$$

For Model (3), the coefficient  $\alpha_3$  measures the varying capacity of individual investors to read earnings information in weekday and weekend announcements, or in other words, the influence of attention on their pricing of earnings components. The coefficient  $(\alpha_3 + \alpha_6)$ , on the other hand, measures the varying capacity of institutional investors to read earnings information in weekday and weekend announcements, or in other words, the influence of attention on their pricing of earnings components. The coefficient  $\alpha_6$  measures the different levels of the influence of attention on institutions and individuals in pricing earnings components. Compared with individual investors,  $\alpha_6$ ,  $\alpha_9$ , and  $\alpha_{12}$  in Model (4) successively measure the different levels of influence of attention on funds, securities traders, and other institutional investors in pricing earnings components. We expect that as the institutional shareholding ratio increases, different attention allocations on various days of a weekly cycle will have a weakened influence on investors in making decisions, that is, coefficients  $\alpha_6$ ,  $\alpha_9$ , and  $\alpha_{12}$  should be significantly positive. Table 11 presents specific test results.

**Table 11** Influence of Different Levels of Investor Attention on Pricing Errors of Accruals — Institutional Investors vs. Individual Investors

Dependent variable:						
<i>RET</i>	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	All	Funds	Securities traders	Others	Full sample
Constant	-0.0417 (-1.61)	-0.0399 (-1.52)	-0.0019 (-0.07)	-0.0451* (-1.71)	-0.0398 (-1.52)	-0.0065 (-0.24)
<i>WEEK</i>	0.0214** (2.20)	0.0214** (2.20)	0.0211** (2.17)	0.0209** (2.14)	0.0216** (2.23)	0.0210** (2.16)
<i>R\_ACC</i>	-0.0104 (-0.73)	0.0123 (0.65)	0.0146 (1.29)	0.0037 (0.19)	0.0030 (0.17)	0.0215 (1.35)
<i>WEEK*R\_ACC</i>	<b>-0.0301**</b> <b>(-1.98)</b>	<b>-0.0382**</b> <b>(-1.97)</b>	<b>-0.0521***</b> <b>(-2.64)</b>	<b>-0.0396**</b> <b>(-1.95)</b>	<b>-0.0362**</b> <b>(-1.91)</b>	<b>-0.0562**</b> <b>(-2.42)</b>
<i>INS</i>		0.0401*** (3.73)				



Dependent variable:						
<i>RET</i>	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F
Independent variable	Full sample	All	Funds	Securities traders	Others	Full sample
<i>INS*R_ACC</i>		-0.0436* (-1.67)				
<i>INS*WEEK*R_ACC</i>		<b>0.0168</b> <b>(0.70)</b>				
<i>FUN</i>			0.0616*** (5.35)			0.0552*** (4.43)
<i>FUN*R_ACC</i>			-0.0712*** (-2.58)			-0.0688** (-2.30)
<i>FUN*WEEK*R_ACC</i>			<b>0.0478**</b> <b>(1.96)</b>			<b>0.0481*</b> <b>(1.88)</b>
<i>SEC</i>				0.0151 (1.24)		0.0066 (0.54)
<i>SEC*R_ACC</i>				-0.0305 (-1.04)		-0.0161 (-0.54)
<i>SEC*WEEK*R_ACC</i>				<b>0.0218</b> <b>(0.81)</b>		<b>0.0134</b> <b>(0.49)</b>
<i>OTH</i>					0.0315*** (2.97)	0.0142 (1.24)
<i>OTH*R_ACC</i>					-0.0256 (-1.03)	0.0001 (0.00)
<i>OTH*WEEK*R_ACC</i>					<b>0.0124</b> <b>(0.54)</b>	<b>-0.0052</b> <b>(-0.21)</b>
<i>LnMV</i>	-0.0051* (-1.69)	-0.0081*** (-2.62)	-0.0127*** (-3.95)	-0.0055* (-1.80)	-0.0076** (-2.46)	-0.0133*** (-4.09)
<i>B/M</i>	0.0478*** (3.93)	0.0495*** (4.08)	0.0413*** (3.40)	0.0481*** (3.96)	0.0486*** (4.01)	0.0427*** (3.50)
<i>E/P</i>	0.4409*** (5.20)	0.4152*** (4.89)	0.3507*** (4.10)	0.4366*** (5.15)	0.4183*** (4.93)	0.3466*** (4.05)
<i>R</i>	0.0975*** (7.06)	0.0952*** (6.90)	0.0910*** (6.59)	0.0973*** (7.05)	0.0951*** (6.89)	0.0905*** (6.55)
<i>PRICE</i>	0.0007 (1.23)	0.0005 (0.82)	0.0000 (0.04)	0.0007 (1.15)	0.0007 (1.15)	0.0001 (0.09)
<i>VOL</i>	-0.0236*** (-3.55)	-0.0228*** (-3.44)	-0.0265*** (-3.98)	-0.0238*** (-3.58)	-0.0226*** (-3.41)	-0.0257*** (-3.86)
<i>YEAR</i>	X	X	X	X	X	X
<i>MONTH</i>	X	X	X	X	X	X
N	8941	8941	8941	8941	8941	8941
Adj. R2 (%)	2.03	2.25	2.58	2.06	2.22	2.63
F	7.00***	7.34***	7.28***	6.90***	7.21***	7.34***
$\alpha_3 + \alpha_6 = 0$		1.08	0.04	0.68	1.37	

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

After excluding observations without institutional investors, we reduce the number of samples to 8,941. We then retest the major findings of this paper with this sample, as shown in Panel A of Table 11. It is clear that investors make more pricing errors on earnings information in weekday announcements in the interval of the full sample when compared with the earnings information in weekend announcements, as shown by the significantly negative coefficient  $\alpha_3$  in Panel A, and so Hypothesis 2 is again tested and proved. Panels B, C, D, and E demonstrate the varying influences of attention on information reading between individual investors, all institutional investors, funds, securities traders, and other institutional investors, respectively. The results show that regardless of the type of institutional investor, attention allocation has no significant influence on the efficiency of information reading on various days of a weekly cycle, as shown by the insignificant coefficient ( $\alpha_3 + \alpha_6$ ). Meanwhile, the influence of different attention allocations on the decisions of institutional investors weakens, as shown by the positive coefficient  $\alpha_6$  in Panels B, C, D, and E. But only those of funds and individual investors show significance, that is, coefficient  $\alpha_6$  is significant only in the test of Panel C, demonstrating that the influence of different attention levels on information reading significantly weakens with the increase in fund shareholding ratios. The test of Panel F similarly supports the finding. Attention has a weakened influence on the decisions of such institutional investors as funds, but because Chinese securities markets are composed of individual investors, institutional shareholding accounts for a small portion of total market value.<sup>15</sup> Thus, the general behavioural characteristics demonstrated in the market are still driven by medium and small investors. In other words, attention still has a significant influence overall on the efficiency of information reading. Moreover, we notice that the coefficient  $\alpha_5$  is significantly negative in Panels B and C, indicating that institutional investors show more obvious herd behaviour, although they are weakly influenced by attention in making decisions. But pricing errors similarly occur at a level possibly higher than that of individual investors, consistent with earlier findings (such as Shiller and Pound, 1989; Scharfstein and Stein, 1990; Banerjee, 1992; Bikhchandani, Hirshleifer, and Welch, 1992; Froot *et al.*, 1992). Generally, the test in Table 11 shows that institutional investors are not significantly influenced by attention in reading information. Meanwhile, the attention devoted by institutional investors to their invested companies is influenced by their share ownership. When these investors hold quite a lot of shares, they will have greater motivation to pay attention to the earnings information of companies and actively collect relevant information for making decisions, thereby greatly weakening the influence of attention on decision judgments.

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<sup>15</sup> We find the following statistics for the proportions of total market value held by institutional investors in total market capitalisation of the A-share stock markets: 1.64 per cent in 2001, 3.82 per cent in 2002, 4.80 per cent in 2003, 7.72 per cent in 2004, 10.61 per cent in 2005, and 13.93 per cent in 2006. On average, total institutional shareholding is relatively small in the sample interval between 1998 and 2006.

### 6.3 Controlling for the Number of Companies Simultaneously Disclosing Earnings on the Same Day

It is obvious that earnings reports are disclosed mostly at the same time in the Chinese securities markets. Hirshleifer, Lim, and Teoh (2009) and Yu and Wang (2009) believe that the amount of earnings information simultaneously disclosed on the same day can significantly influence the capacity of investors to read such information. Although competitive disclosure of information decreases their capacity to handle corporate information, it can provide them with more information about the market and boards (Peng and Xiong, 2006). In the Chinese markets, the rise and fall of stock prices are highly synchronised, and information about the market and boards plays a leading role in market pricing. Thus, an increase in competitive information disclosure will strengthen investor response to the market and enhance the efficiency of reading information. Consequently, we find that investors have varying capacities to read earnings information disclosed on different days of a weekly cycle, but is this due to their different allocations of attention on different days of the weekly cycle or to the varying numbers of earnings reports simultaneously disclosed on different days of the cycle? In other words, is the cyclical effect of the accrual anomaly a kind of independent phenomenon or just another manifestation of competitive information quantity? Afterwards, we control for the number of companies simultaneously disclosing earnings on the same day, and adopt Model (5) to retest the major results of this paper. Table 12 reports the relevant results.

$$\begin{aligned}
 RET_{t+1} = & \alpha_0 + \alpha_1 \times WEEK + \alpha_2 \times R\_ACC_t + \alpha_3 \times WEEK \times R\_ACC_t + \alpha_4 \times NUM_t \\
 & + \alpha_5 \times NUM_t \times R\_ACC_t + \alpha_6 \times NUM_t \times WEEK \times R\_ACC_t + \alpha_7 \times LnMV_t \\
 & + \alpha_8 \times B/M_t + \alpha_9 \times E/P_t + \alpha_{10} \times R_t + \alpha_{11} \times PRICE_t + \alpha_{12} \times VOL_t + \varepsilon_{t+1} \quad (5)
 \end{aligned}$$

As Panels A and C show, when we enter two variables into the models (one representing the days of a weekly cycle, which stand for different allocations of attention, and the other representing competitive information quantity, which stands for the difficulty of information processing), the coefficient of the interaction term  $WEEK \times R\_ACC$ , which stands for the days of a weekly cycle and the size of accruals, is still significantly negative. This demonstrates that investors still show stronger efficiency in reading earnings information disclosed on weekends compared with weekdays after we control for the number of announcements simultaneously disclosed on the same day. At the same time, the coefficient of the interaction term  $NUM \times R\_ACC$ , which stands for competitive information quantity and the size of accruals, is still significantly positive, which is as expected. In other words, an increase in the number of simultaneously disclosed announcements can strengthen investor efficiency in reading information at the market and board levels, thus contributing to the decrease in investor difficulty in processing information and in pricing errors of earnings components. This test shows that both the days of a weekly cycle and the quantity of competitive information in the

**Table 12** Influence of Different Levels of Investor Attention on Pricing Errors of Accruals — Controlling for the Quantity of Simultaneously Disclosed Earnings on the Same Day

Dependent variable:				
<i>RET</i>	Panel A	Panel B	Panel C	Panel D
Independent variable	Full sample	Full sample	Full sample	Full sample
Constant	-0.0110 (-0.93)	-0.0111 (-0.94)	-0.0295 (-1.16)	-0.0299 (-1.17)
<i>WEEK</i>	0.0258*** (2.85)	0.0261*** (2.88)	0.0232** (2.57)	0.0235*** (2.60)
<i>R_ACC</i>	<b>-0.0259</b> <b>(-1.52)</b>	<b>-0.0127</b> <b>(-0.63)</b>	<b>-0.0214</b> <b>(-1.26)</b>	<b>-0.0070</b> <b>(-0.35)</b>
<i>WEEK*R_ACC</i>	<b>-0.0357**</b> <b>(-2.39)</b>	<b>-0.0522**</b> <b>(-2.57)</b>	<b>-0.0333**</b> <b>(-2.24)</b>	<b>-0.0513**</b> <b>(-2.54)</b>
<i>NUM</i>	-0.0306*** (-2.74)	-0.0308*** (-2.76)	-0.0262** (-2.35)	-0.0264** (-2.37)
<i>NUM*R_ACC</i>	<b>0.0351*</b> <b>(1.87)</b>	<b>0.0127</b> <b>(0.48)</b>	<b>0.0345*</b> <b>(1.85)</b>	<b>0.0100</b> <b>(0.38)</b>
<i>NUM*WEEK*R_ACC</i>		<b>0.0292</b> <b>(1.20)</b>		<b>0.0319</b> <b>(1.32)</b>
<i>LnMV</i>			-0.0033 (-1.14)	-0.0032 (-1.13)
<i>B/M</i>			0.0416*** (3.45)	0.0415*** (3.45)
<i>E/P</i>			0.4193*** (4.91)	0.4195*** (4.92)
<i>R</i>			0.0810*** (7.18)	0.0812*** (7.20)
<i>PRICE</i>			-0.0008* (-1.67)	-0.0008* (-1.67)
<i>VOL</i>			-0.0244*** (-4.12)	-0.0244* (-4.13)
<i>YEAR</i>	X	X	X	X
<i>MONTH</i>	X	X	X	X
N	11350	11350	11350	11350
Adj. R2 (%)	0.80	0.82	1.77	1.79
F	2.38***	2.36***	5.21***	5.17***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

announcement influence information reading, and the two mechanisms simultaneously play a role. The tests of Panels B and D similarly provide extra evidence. When we then introduce the triple cross term  $NUM*WEEK*R\_ACC$  to test the interactive influence of the two mechanisms, the coefficient of  $NUM*R\_ACC$  is not significant, while that of  $WEEK*R\_ACC$  is still significantly negative. The coefficient of  $NUM*WEEK*R\_ACC$ , however, is not significant, demonstrating that competitive information quantity does not significantly influence information reading with regard to the announcement days of a weekly cycle. In general, our test of competitive information quantity confirms that our suggested influence of different allocations of investor attention on the efficiency of information reading according to days of a weekly cycle is independent of the number of competitive information disclosures. In addition, the influences of the cyclical effect of attention and the number of competitive information disclosures on investor information reading are two independent phenomena driven by different mechanisms.

#### **6.4 Stability of the Influence of Investor Attention on Pricing Errors**

We adopt the method of Fama-MacBeth (1973) and further test the stability of the influence of different levels of investor attention on pricing capacity according to different days of a weekly cycle, and analyse the variation characteristics of the influence at different intervals. At first, we test the influence of investor attention on the efficiency of information reading during all half-years, and then summarise the regression results in all sample intervals. We calculate the mean value of the coefficients to see whether the coefficient and intercept term differ significantly from 0, so as to test whether the influence is stable. Table 13 reports the test results and tells us that the influence is stable and persistent in the full sample interval. Meanwhile, investors are in high spirits in a bull market and optimistic about the aftermarket, and they exert less cognitive effort in making decisions, thus magnifying the influence of different attention levels on decision-making behaviour, which further confirms Hypotheses 2 and 3.

#### **6.5 Other Sensitivity Tests**

To reduce the influence of measurement errors and extreme values, we follow the practice of the relevant literature (such as Pincus, Rajgopal, and Venkatachalam, 2007; Zhang, 2007; DellaVigna and Pollet, 2009; Gong, Li, and Xie, 2009) and use statistically tailed treatment on future returns of stock prices. But such treatment may also lead to errors in the results because it is like making use of future information, and so we use the original numerical value (before extreme-value treatment) to retest the major findings of this paper, and the major conclusions are not changed. To measure total earnings, some studies adopt operating profits (such as Sloan, 1996; Chan *et al.*, 2001; Fairfield *et al.*, 2003), while others adopt net profits (such as Subramanyam, 1996; Collins and Hribar, 2000; Xie, 2001; Barone and Magilke, 2009). After comparing the conclusions

**Table 13** Influence of Different Levels of Investor Attention on Pricing Errors of Accruals

Dependent variable:				
variable: <i>RET</i>	Panel A	Panel B	Panel C	Panel D
Independent variable	Full sample	Full sample	In a bull market	In a bear market
Constant	0.2555* (1.81)	0.2216 (1.57)	0.2661 (1.36)	0.0641 (0.28)
<i>WEEK</i>		0.2085* (1.86)	0.2240* (1.91)	0.2543 (1.31)
<i>R_ACC</i>	<b>-0.1923*** (-3.09)</b>	<b>-0.0141 (-0.65)</b>	<b>0.0747 (0.79)</b>	<b>-0.0992 (-0.71)</b>
<i>WEEK*R_ACC</i>		<b>-0.2217** (-2.23)</b>	<b>-0.3185** (-2.13)</b>	<b>-0.1170 (-1.04)</b>
<i>LnMV</i>	-0.0788 (-1.53)	-0.0805 (-1.52)	-0.0534 (-1.30)	-0.0665** (-2.32)
<i>B/M</i>	0.2206** (2.13)	0.2256** (2.15)	0.1443* (1.75)	0.2733*** (3.93)
<i>E/P</i>	0.5857*** (3.98)	0.5737*** (3.96)	0.3045 (1.41)	1.0782*** (6.34)
<i>R</i>	0.4342*** (5.47)	0.4274*** (5.45)	0.4429*** (5.24)	0.2603*** (5.10)
<i>PRICE</i>	0.0008 (0.00)	0.0057 (0.02)	-0.0925** (-2.27)	0.1251 (1.32)
<i>VOL</i>	-0.2672*** (-3.29)	-0.2620*** (-3.28)	-0.2271*** (-3.90)	-0.0637*** (-3.26)
<i>YEAR</i>	X	X	X	X
<i>MONTH</i>	X	X	X	X
N	11350	11350	6427	4923
Adj. R2 (%)	5.56	5.76	5.80	9.52
F	6.33***	6.37***	4.91***	5.76***
$\alpha_2 + \alpha_3 = 0$		30.33***	14.98**	15.90***

Note: T values are in brackets. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

of the above, we find that the general conclusions are not influenced much regardless of measurement method. Considering that some companies are missing data on operating profits, we adopt net profits to define the size of earnings. To test whether our results are influenced by the measurement method of earnings, we adopt net profits to measure earnings and retest the major findings of this paper. The major conclusions still hold. To achieve the purpose of the study, we need to use a more accurate window interval to measure future stock returns, and so we calculate such returns from the second trading day after earnings announcements. But some enterprises do not disclose earnings at that time, and investors cannot know the earnings and their components of all enterprises in the market, resulting in hindsight bias. Although such a problem exists in most literature concerning research on post-earnings-announcement drift (PEAD) and the accrual anomaly (such as Collins and Hribar, 2000; Ke and Ramalingegowda, 2005; DellaVigna and Pollet, 2009; Hirshleifer, Lim, and Teoh, 2009; Kong and Ke, 2007), to ensure robustness we sort current sample companies by the size of the last accruals in order to establish an investment portfolio for the sensitivity test and eliminate the influence of hindsight bias. The major conclusion of this paper remains the same after such an error is avoided. To further test the robustness of the results, we select another method to define the intervals of a bull market and a bear market and retest the major findings of this paper. In accordance with the trend of the Shanghai Composite Index, we define the intervals from January 1998 to June 2001 and from October 2005 to December 2006 as bullish, in which the Chinese A-share stock markets remain in an uptrend over a long period. Similarly we define the interval from July 2001 to July 2005 as bearish, in which the Chinese A-share stock markets remain in a downtrend over a long period. The division also conforms to other literature (such as Lu and Xu, 2004; Lu, 2007; Wu, 2007; Qiao, 2008; Lin and Li, 2009). The empirical results show that the major conclusions of this paper are not influenced by the method of defining a bull or a bear market. Moreover, we also adopt samples of quarterly reports to retest the findings, and the major conclusions still hold.

## VII. Conclusion

Investor capacity to read information reflects the propagation efficiency of information in the capital market and becomes one of the important indicators measuring the effectiveness of the capital market. In accordance with relevant findings in cognitive psychology and behavioural finance, and taking varying levels of investor attention in different time series as the entry point, we study the influence of investor attention on the accrual anomaly. Our findings show that when investors pay more attention to reading earnings information, they increase their cognitive needs and will collect as much relevant information as possible to correctly read earnings and avoid the accrual anomaly. But when investors have limited attention, they devote reduced cognitive resources to reading information; cognitive motivation thereby weakens, and pricing

errors increase, resulting in the accrual anomaly. As the shareholding ratio of institutional investors increases, investor attention has a weakening influence on information reading, showing that institutional investors led by funds contribute to improving the information reading efficiency of investors and strengthen the effectiveness of resource allocation. Moreover, investors have different moods and mentalities at different stages of a stock market cycle. As a result, the influences of investor attention on capacity to read information vary, and such influences will be strengthened in a bull market. Our research better integrates relevant findings in multidisciplinary fields, including behavioural economics, cognitive psychology, and behavioural finance, and plays a guiding role in understanding information disclosure and information transmission mechanisms in the Chinese capital market. Our study could help researchers further understand basic issues, such as investor behaviour and price formation, and help investors make correct pricings while improving the efficiency of resource allocation in the capital market. In addition, our findings provide guidelines for decision makers in formulating relevant policies to optimise the information disclosure system, enhance investor efficiency in reading earnings information, and strengthen market efficiency. Meanwhile, the findings of this paper also indicate that it is reasonable and effective for us to take days of a weekly cycle as a characteristic variable for investor attention, which could be applied and extended to future research concerning investor attention.

## References

Please refer to pp. 143-150.