公司财务信息错报的分析程序研究：战略视角、量化模型和认知心理

邓川 著

经济科学出版社

公司财务信息错报的分析程序研究：战略视角、量化模型和认知心理

邓　川　著

公司财务信息错报的分析程序研究：
战略视角、量化模型和认知心理
邓　川　著

摘　　要

　　近年来，国内外频繁爆发了一系列财务信息舞弊案，它们严重危及资本市场的健康发展，也使审计职业界面临前所未有的信用危机。为防范审计失败，各国监管机构、审计准则制定机构出台了各种管制政策或措施，其中之一就是重构审计模式。2003 年 10 月，国际审计与鉴证准则理事会（IAASB）正式发布了三个新的国际审计风险准则，标志着现代风险导向审计的正式确立。

　　新国际审计风险准则正式引进"重大错报风险"概念，审计的重心前移到风险评估。陈毓圭（2004）认为，现代风险导向审计的一个重要特征就是注重运用分析程序，以识别可能存在的重大错报风险。马贤明、郑朝晖（2005）认为，现代风险导向审计中的风险评估以分析程序为中心，分析程序成为最重要的程序。刘明辉（2006）认为，尽管风险评估涉及询问、检查、观察、穿行测试等多种搜集证据的手段，但分析程序却是最有效的方法。王玉涛、卢利平（2006）认为，分析程序审计技术是风险导向审计的实践基础。与此同时，监管部门和一些学者对分析程序的作用却表示出一定程度的怀疑。美国证券交易委员会前首席会计师莱恩·特纳（Lynn Turner）就批评大会计师事务所在使用新的审计方法时，更多地依赖于以分析程序为主的风险评估，从而减少了实质性的细节测试。黄世忠等（2004）通过对世界通信公司案例的分析，认为安达信全面借助电脑软件执行分析程序不符合审计基本常识，显失职业审慎。王泽霞（2004）也认为分析性测试未必有效。

　　由此可见，各方对分析程序的认识还有分歧，我国审计理论界

目前对分析程序还缺乏深入的研究。本书的研究目标就是深化对现代分析程序理论和实务的认识，研究在现代风险导向审计下如何提高分析程序识别重大错报风险的绩效。本书主要从审计技术和审计认知过程两个角度出发，首先研究分析程序的基本理论，这是本书的基础。然后，笔者从战略系统视角、统计量化分析技术、认知心理过程三个方面探讨如何提升分析程序的绩效。最后，调查审计实务中分析程序的使用情况和问题，并提出改进建议。具体而言，本书在导论的基础上进一步分为八章。各章主要内容如下：

一、对分析程序产生与发展的研究

本章结合审计模式的演变，对分析程序的产生与发展进行历史研究，提出了账项导向审计阶段是分析程序的萌芽和初步发展阶段，19 世纪 80 年代英国审计程序中的账户分析，可以说是分析程序的萌芽；在制度导向审计阶段，分析程序在审计准则中的地位正式确立；在风险导向审计阶段，分析程序成为强制性审计程序，并逐渐成为风险评估的核心程序。笔者认为，分析程序快速发展的理论与实务背景在于三个方面：外部日益扩大的审计期望差，以及由此导致的诉讼爆炸和政府管制威胁；会计师事务所面临的成本压力；系统论为分析程序提供了方法论基础。

二、分析程序基本理论研究

本章采用规范研究方法，首先对分析程序的概念进行了剖析，对分析程序的各种技术方法进行了探讨，指出其适用范围、局限性。然后，阐述分析程序与审计风险、重要性、审计证据等审计基本概念的关系。具体分析了分析程序在审计风险模型中的定位，指出该模型没有完全涵盖分析程序的风险；探讨了重要性对计划实质性分析程序和异常波动判断的影响；比较了分析程序与细节测试两种获取证据方式的差异，并对传统分析程序被贴上"软证据"标签的观点进行了评价，指出分析程序已经成为现代审计中必不可少的组成部分。最后，笔者从经济学中的"有限理性"角度出发，指出审计师有限的信息加工能力和避免智力努力的倾向，从而指出了统

计技术、计算机辅助分析工具对分析程序的深远影响，分析了统计技术在分析程序中形成预期和评价异常波动方面的优势，以及计算机技术为实现统计技术在分析程序中的广泛应用方面发挥的作用。

三、基于战略系统视角的分析程序研究

在分析程序中，要合理把握不同财务数据之间以及财务数据与非财务数据之间的内在关系，并在此基础上形成准确的预期，审计师必须深入了解客户经营及其行业环境。然而，在审计师如何了解客户经营和行业知识方面，权威准则和指导是不充分的。其中一个关键问题是：审计师是否应对所了解的各个项目给予同等重要的考虑？如何将这些信息通过一个切入点（视角）整合起来，从而对报表项目形成一个整体预期？为此，本章首先阐述分析程序中了解客户经营活动和环境的重要性，指出了传统审计方法在这方面存在的不足。然后，笔者分析了基于战略系统视角的客户了解框架，以及这种框架下的分析程序流程，认为基于战略系统视角的分析程序将有助于提高审计师诊断差错和舞弊的能力。最后，考虑到目前我国对战略系统审计方法的看法存在分歧，因此笔者也对战略系统审计方法与现代风险导向审计的关系加以探讨。

四、分析程序异常波动调查规则研究

在运用分析程序时，一个关键问题是如何有效地定义什么波动是异常波动，即采用什么样的调查规则。不同的调查规则对分析程序的效率和效果都有重要影响。本章首先探讨四种调查规则：基于简单判断的规则；考虑审计重要性的简单规则；不考虑审计重要性的统计规则；考虑审计重要性的统计规则。然后，采用人为植入差错的模拟研究方法去检验四种调查规则的绩效。研究结果总体上支持采用基于统计技术的调查规则，综合运用了重要性和统计技术的月度重要性规则相对最优。此外，本章也探讨了统计规则中的肯定式方法和否定式方法。这两种方法的主要差别在于统计原假设的不同以及是否考虑审计重要性。相对而言，否定式方法与审计重要性和审计风险两个概念结合得更紧密，与合理保证账户不存在重大差

错的审计目标是完全吻合的。

五、分析程序预期模型的准确性和差错检查绩效研究

目前，我们对分析程序有效性的认识大多来自国外的文献，以及国内被查处上市公司的事后分析结果，但这会产生两个问题。首先，国外的研究结论在我国未必有效。其次，对我国被查处上市公司的事后分析结果只能说明分析程序对这些已经出现严重问题的公司是有效的，但对于那些未被查处公司而言，分析程序的效果如何无人涉及。因此，本章利用我国化工行业上市公司实际数据和模拟研究方法，实证研究了分析程序各种预期模型的预测准确性和差错检查绩效。得出如下结论：（1）与简单的随机游走模型相比，无论是在预测能力还是在差错检查能力方面，使用统计技术可以提高分析程序的有效性；（2）采用统计方法的分析程序作为一种对重大错报的预警方法是有效的，但它们不能合理保证检查出相对较小、分布更分散的差错，审计师因而不能在实质性测试中过分信赖分析程序，而应将实质性分析程序与细节测试结合使用，以实现合理的审计保证水平；（3）外部宏观经济指标和行业指标确实对预测数据有一定的解释能力，这在一定程度上支持了现代风险导向审计中要求加强了解被审计单位及其环境的观点。

六、分析程序中的审计判断及其绩效研究

在分析程序中，审计判断扮演着不可或缺的角色。本章首先探讨了分析程序判断绩效的含义，分析了如何从效果性（共识、一致性和自我洞察力）和效率性两方面来评价分析程序的判断绩效；然后，从审计师主体因素、环境因素和任务因素三方面出发，得出分析程序的绩效函数，并具体分析了知识、经验、任务结构化程度、审计师的激励、时间压力等因素对分析程序绩效的影响；最后，鉴于人的有限理性，审计师在审计判断与决策过程中并没有采用贝叶斯规则，而是大量采用了启发法（Heuristics）。为此，笔者以现有文献为基础，采用描述性研究方法，探讨了分析程序中存在的三种启发法：代表性启发法（Representativeness Heuristic）、可得性启发

法（Availability Heuristic）、锚定和调整启发法（Anchoring and Adjustment Heuristic），并对每一种方法的合理性以及可能存在的偏误进行了分析，指出了防治措施。

七、基于认知心理学的分析程序研究

心理学家认为，对决策过程的更好认识在于详细地描述信息处理过程（即认知过程）。分析程序在很大程度上是一个认知的过程。运用分析程序分析异常波动原因的过程，就是一个从信息获取到信息输出的信息加工过程。审计师在执行分析程序时，通常采用了诊断推理的四个典型过程：心理表征、假设生成、信息搜寻和假设评价。

本章结合认知心理学，对分析程序的四个典型过程以及后续审计行动决策进行了探讨：（1）在心理表征部分，笔者分析了审计经验对心理表征的影响，指出了良好的模式识别能力对分析程序绩效的重要影响；（2）在假设生成阶段，差错知识和经验有助于形成更准确的初始假设。同时，这一阶段也存在线索效应、典型效应和干扰效应。此外，笔者也探讨了初始假设集的规模对分析程序效率和效果的影响；（3）在信息搜寻阶段，笔者探讨了顺序式（Serial）、平行式（Parallel）以及简化式（Truncated）的信息搜集方法，并分析了假设生成与信息搜寻之间的相互依存关系，以及受托责任和时间预算对分析程序测试策略的影响；（4）在假设评价部分，笔者探讨了假设评价的代数更新过程（Algebraic-Updating Processes）和基于语义或理解的过程（Linguistic/Comprehension-Based Process），比较分析了互补策略和独立策略这两种假设修正策略，并探讨了假设评价中对初始假设的过度自信及其防范措施；（5）在后续审计行动决策阶段，笔者探讨了分析程序结果与账户公允性及后续审计行动决策之间的关系，指出了不对称运用分析程序的现象及其含义。

八、对分析程序使用情况的调查与分析

目前，我国审计理论界对实务中如何使用分析程序还没有进行过系统的调查。为此，本章以浙江省的注册会计师为样本进行了专项调查，以期了解审计实务中分析程序的执行情况，找出其中存在

的问题并提出相关建议。调查结果显示：注册会计师普遍认为分析程序作用较大，尤其认可它在识别潜在错报风险领域方面的作用，但他们对利用分析程序取得实质性证据的做法持谨慎态度；在分析程序的具体方法上，事务所更多地选用一些很简单的方法，更复杂但更准确的统计方法几乎没有采用；在一些常用方法中以及在对重大波动的进一步调查中，注册会计师仍存在着一些偏误需要改进。因此，行业协会应该提供更详细的分析程序指导，组织相关的培训，以减少分析程序执行中的偏误，提高审计效果。

纵观全书，本研究的创新之处在于：

1. 对现有各种分析程序的适用范围、局限性以及与其他审计基本概念的关系进行了较深入的研究，探讨了分析程序在整个审计理论体系中的重要地位，这将加深我们对分析程序的认识，有助于风险导向审计中更准确地进行风险识别。

2. 利用我国上市公司实际数据，实证研究了分析程序中形成期望值的各种模型的预测准确性和差错检查绩效。这将有助于分析程序实务的改进，同时对公司更准确地进行财务预测具有借鉴意义。

3. 结合认知心理学和国外分析程序文献，对分析程序中的审计判断进行了系统的梳理。这为我国今后进一步开展审计判断理论研究、完善审计准则，为会计师事务所加强职业培训和质量控制奠定了一定的基础。

4. 对我国注册会计师实际使用分析程序的情况进行了问卷调查，其结果对进一步开展分析程序理论研究和完善相关审计准则和实务有参考价值。

Abstract

A serial of financial fraud scandals happened frequently in recent years, which endanger the development of capital market heavily, make the audit profession encounter an unprecedented credit crisis. In order to prevent audit failure, regulatory organization and auditing standards setter in many countries issued many regulatory policies and measures, one of those is to restructure audit methodology. In 2003, International Auditing and Assurance Standards Board (IAASB) release three new audit risk standards, it imply that the modern risk-based auditing (MRBA) has been established officially.

The new international audit risk standards introduce the concept of material misstatement risk (MMR), audit focus has been converted to risk assessment. Some scholars argued that a main feature of MRBA is paying attention to analytical procedure (AP) to identify MMR; the center of risk assessment in MRBA is AP. Despite of the importance of enquiry, inspection, observation and walk-through procedures, AP is the most effective procedure. Other scholars believe that AP is the basis of MRBA. On the other hand, regulatory organization and other scholars doubt the function of AP. Lynn Turner, the predecessor chief accountant of SEC, criticizes that the large audit firms overly rely on analytical-procedure-based risk assessment to replace substantive tests. By studying the World Telecom case, some scholars think that Author Anderson, one of the Big Five, impaired the professional skepticism when using computer

to perform AP completely.

According to these facts, we can conclude that there are discrepancies for AP among the scholars. Audit academia has not study AP deeply. The objective of this dissertation is to deepen the understanding for modern AP theory and practice, to study how to improve the performance of AP when identifying MMR. From the two perspectives of audit technique and cognitive psychology, it firstly studies the basic theory of AP. From the three aspects of strategy system, statistical technique and auditors' cognition, this paper then discusses how to improve the performance of AP. Lastly, it investigates the application of AP in audit practice by questionnaire. This paper has been divided into eight chapters as following:

Chapter 1 research on the rise and development of AP

Combined with the evolvement of audit methodology, this part studied the rise and development of AP. We think that AP emerge in the stage of account-based auditing, the original idea of AP is the account analysis in UK in 1980s. In the stage of control-based auditing, the importance of AP has been recognized formally in audit standards. In the stage of risk-based auditing, AP becomes a compulsory procedure and the core procedure of risk assessment. The reasons for the development of AP lie in three aspects: the increasing expectation gap, the resulting litigation risk and regulatory threat; the cost pressure of audit firms; the methodology basis of system theory.

Chapter 2 research on the basic theory of AP

Firstly, this chapter compares and analyzes the concept of AP, studies the different techniques of AP and their application and limitation. Secondly, we illustrate the relation with audit risk, audit materiality and audit evidence. Especially, this paper analyzes the orientation of AP in audit risk model, and points out that this model does not

include all the risk of AP. We also discuss the difference between AP and detailed test, think that AP has becomes a absolutely necessary component in modern auditing. Lastly, based on auditor's bounded rationality, we point out the strength of statistical technique and decision aids, its profound impact on AP.

Chapter 3 research on the strategy-system-based AP

In order to master the plausible relationships among both financial and non-financial data, to form accurate expectation value, the auditors must understand client's operation and the industry within it. However, the authoritative standards are not enough to provide guidance with auditor in this aspect. A key question is whether the auditors should pay the same attention to every item, how to integrate these items by a perspective to form a comprehensive expectation?

Firstly, the chapter illustrates the importance to understand the client's operation and the industry within it, points out the drawback of classical audit technique. Secondly, we analyze the strategic-systems-based knowledge acquisition framework, the corresponding AP process. We think strategic-systems-based AP will help improve auditors' misstatement detection ability. Lastly, we discuss the relation between strategic-systems-based auditing methodology and MRBA.

Chapter 4 research on investigation rule of AP

In applying AP, a critical question is how to define the unusual fluctuation or which investigation rule to use. Different rules have important impact on the effectiveness and efficiency of AP. This chapter begins with discussing four types of rules: simple judgment-based rule, materiality-based simple rule, statistical rule without considering audit materiality, and materiality-based statistical rule. Then, it tests the performance of the four rules by simulation study. The result indicates the strength of statistical rule. Lastly, this part discusses the positive ap-

proach and negative approach in statistical rule. The difference between these approaches lies in the hypothesis and materiality consideration. Negative approach is consistent with the audit objective, which provides reasonable assurance that there is no material misstatement in the financial statements.

Chapter 5 research on the accuracy and the misstatement detection performance of AP expectation models

At present, we learn AP's effectiveness from the oversea literature or disciplined domestic listed companies. However, this will bring out two questions. First, the result of oversea literature may not be necessarily appropriate for China. Second, AP's effectiveness on the disciplined domestic listed companies is not surprising. How about the effectiveness when applying AP to undisciplined companies in China? No one answer the question. Therefore, this chapter uses the actual data of listed companies in chemical industry, applies simulation study to test the accuracy and the misstatement detection performance of different AP expectation models. The results indicate that: first, whether in prediction accuracy or in misstatement detection performance, statistical technique is superior to simple random walk model. Second, statistical AP is effective to signal material misstatement, but it can not detect smaller or more dispersed misstatements. Hence, the auditors should not rely on AP heavily in substantive test. Instead, AP should be combined with detailed test to provide reasonable assurance. Last, macro economical indicators and industry indicators are useful for prediction, which provides support for emphasis on the understanding of entity in MRBA.

Chapter 6 research on audit judgment and its performance in AP

Audit judgment plays a key role in AP. This chapter firstly discusses the means of judgment performance in AP, and analyzes how to evaluate the judgment performance in AP according to effectiveness and efficiency.

Secondly, it infers the performance function from the auditor factor, environment factor and task factor, discusses the effect on performance function of knowledge, experience, task structured level, auditors' incentive and time pressure. Lastly, given auditor's bounded rationality, auditors use heuristics in audit judgment and decision process instead of the Beyes theorem. So we analyze three heuristics: representativeness heuristic, availability heuristic, anchoring and adjustment Heuristic, including their reasonableness, possible biases and countermeasures.

Chapter 7 research on AP from the cognitive psychology

Psychologists indicate that detailed describing information processing can lead to better understanding for decision process. AP is a cognitive process to great degree. The process of identifying unusual fluctuation by AP is an information processing procedure from information input to information output. When performing AP, auditors typically follow four steps: mental representation, hypothesis generation, information search, hypothesis evaluation.

Using the theory of cognitive psychology, this chapter discusses the four steps and decision about subsequent audit actions: (1) for mental representation, we analyze the effect of audit experience on it, and point out that sound ability in pattern recognition is vital for the performance of AP; (2) for hypothesis generation, error knowledge and experience would help form more accurate initial hypothesis. At the same time, there are cuing effect, typicality effect and interference effect in this stage. Besides, we discuss the effect of the size of initial hypothesis set on the effectiveness and efficiency of AP; (3) for the information search, we probe into the three choices: serial-search strategy, parallel-search strategy and truncated-search strategy, analyze the interdependence between hypothesis generation and information search, and discuss the impact of accountability and time budget on test strategy of AP; (4) for

hypothesis evaluation, this paper compares algebraic-updating processes and linguistic/comprehension-based process, analyzes independent strategy and complementary strategy, and discuss the over-confident phenomenon and the countermeasures in hypothesis evaluation; (5) for decision about subsequent audit actions, we discuss the relation between AP result, fair representation of account and decision about subsequent audit actions, point out the phenomenon of asymmetric application of AP result and its implication.

Chapter 8 empirical investigation on the application of AP in practice

At present, scholar in China has not investigated systematically the application of AP in practice. Therefore, the chapter investigates it by questionnaire so as to understand the status and the drawbacks, and to bring forward some suggestions. The result indicates that auditors appreciate the function of AP, but they doubt the effectiveness of substantive AP. Auditors generally select simple AP technique, they seldom use more complex and accurate statistical techniques. There are biases in some common methods and in investigation of unusual fluctuation. So, the audit profession should provide more detailed AP guidance and continuing training, to reduce the biases and improve the audit effectiveness.

Contribution of this dissertation

1. It systematically studies the application, limitation of different AP technique, analyzes the relation between AP and other important audit concept, and discusses the role of AP in audit theory. Therefore, this would deepen the understanding for modern analytical procedure theory and practice, and help identify MMR accurately.

2. It uses the actual data of listed companies in chemical industry, applies simulation study to test the accuracy and the misstatement detection performance of different AP expectation models. This would improve

the AP practice, and have implication for accurate financial prediction.

3. Combined with cognitive psychology and oversea literature, it integrates systematically the audit judgment in AP. This would provide supports for audit judgment research, the improvement of audit standards, professional training and quality control of audit firms.

4. It investigates the application of AP in audit practice with questionnaire, which results have implications for studying AP theory and improving audit standards & practice.

The limitation and implication for future research

1. When testing the accuracy and the misstatement detection performance of different AP expectation models, the sample only includes sixteen listed companies in chemical industry, the account studied only focus on sale revenue, and we use simulated monthly data instead of actual data. They all affect the correctness of my conclusions. Future research can test more accounts other than revenue, or use actual monthly data to test the effectiveness of AP.

2. The research on cognitive process of AP is descriptive, and only focuses on generalizing current literature. The dissertation does not apply experimental research method to study a concrete issue.

3. The survey is based on the auditor sample of Zhejiang province, so the results may be different from the actual condition of population in China. Future research can expand the sample, and study deeply one area.

4. The dissertation mainly studies audit by certified public accountants. It seldom includes the governmental audit and internal audit. Future research can study the special issues in governmental audit and internal audit.

目　　录