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# *Government regulations, internal governance and the efficiency of accounting firms*

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**Abstract:** Currently, governments across the world are tightening the regulations on accounting industry. In such a context, the effects of government regulations and internal governance on the efficiency of accounting firms are studied using DEA-Tobit two-stage analysis framework and difference-in-difference (DID) method using internal financial data of accounting firms (2006~2016) in Guangdong province, China. The research results demonstrate that Chinese accounting firms show low comprehensive efficiency and resource allocation efficiency. Government regulations are significantly negatively correlated with the efficiency of accounting firms; while proper internal governance contributes to the improvement of the efficiency and has positive regulating effects on the efficiency loss caused by government regulations. furthermore, the accounting firms that have larger size and higher business concentration have the lower efficiency. higher specialization and industrial agglomeration degrees contribute more to the improvement of the efficiency. The results obtained suggest that if the rigorous government regulations can facilitate internal governance and construction of accounting firms; playing self-governance role as partners. Furthermore, the efficiency loss caused by the strict external regulations can be reduced to some extent.

**Keywords:** Government regulation, Internal governance, Accounting firms, Efficiency

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# 1. Introduction

Chinese economy is now experiencing a great transition, changing its economic growth mode from being driven by inputting production factors to the total factor productivity (TFP) driving one. Whether the transition can succeed depends on the technological innovation and institutional arrangement of Chinese economy (Guner et al., 2008；Hsieh et al., 2009；Miller et al., 2000； Restuccia et al.,2013). Among various institutional arrangements, macroscopic ones of the government including market regulations, industrial regulations, and industrial policy and microscopic ones such as internal governance, organizational nature, and organizational structure most dramatically affect economic and organizational efficiencies (Bates et al., 2005；Bertrand et al., 2003；Billett et al., 2011,；Dittmar et al., 2007；Giroud et al., 2011； Guner et al., 2008； Fang et al., 2013； Yang et al., 2010； Yu, 2010； Zhang et al., 2012). However, disputes always exist in the relation between government regulations and economic efficiency. In the view point of public interest theory, government regulations lift market efficiency by improving information environment and resource allocation (Stiglitz, 1977；Coase, 1988；Viscusi et al., 2005); while regulatory theories such as regulatory capture and rent-seeking theories argue that government regulations can finally lead to losses in market efficiency and social welfare as they distort market relations and causes misallocation of resources (Stigler, 1971；Posner, 1974；North, 1990；Hart et al., 2008；Fehr et al., 2011；Chang et al., 2014；Karpoff et al., 2010；Shin & Kim, 2002；Chen et al., 2009；Xu et al., 2013；Li et al., 2014； Li et al., 2015).

Existing studies hold different opinions on the relation between government regulations and economic efficiency. Furthermore, many scholars also believe that the government regulations show spillover and a substitution relation with the corporate governance mechanism: under unsound external regulations including laws and regimes, a corporation voluntarily promotes its internal governance mechanism to guarantee its high efficiency (Allen et al., 2005；Cheffins, 2001；Glaeser et al., 2001；La Porta, 1999,2000；Johnson et al., 2000；Chen et al., 2008；Wang et al., 2016). Previous researches state that external regulations and internal governance have substitution effects on each other, so they are carried out on the premise that government regulations impose positive incentive effects on economic efficiency. With the presence of disputes in the relation between government regulations and economic efficiency, the effects of corporate governance on economic efficiency and on the efficiency incentive or efficiency loss resulting from government regulations are less concerned.

China is a traditional society with strong external regulations while weak internal governance (Bodde & Morris, 1973； Chen et al., 2008； Yu et al., 2010). As accounting industry exercises its public function of supervising social economic by laws, in China and even across the world it is always the industry most strictly regulated and supervised by governments, especially for Chinese accounting firms involved in securities and futures market. They are under the administrative control of its administrative department, the Ministry of Finance, and the entrusted management institution, the Chinese Institute of Certified Public Accountants (CICPA). Apart from these, their business is also strictly regulated by China Securities Regulatory Commission (CSRC), the competent department of securities and futures industry, as well as the profession regulations from financial competent departments such as the People's Bank of China. In addition to these, various stakeholders of listed companies including institutional investors, minority shareholders, and creditors, and public opinions also pay much attention to and supervise these accounting firms.

Compared with accounting firms unqualified for securities-related business, those qualified for this business are faced with tougher government regulations and supervisions. Benefiting from the constant, high-speed growth of Chinese economic especially the capital

market in the recent decade, Chinese accounting industry maintains a rapid development at the annual growth rate of 14.37% which is far higher than that of GDP (9.39%) in the same period. However, the industry still faces problems such as low technical efficiency and resource allocation efficiency[1] (Xu et al., 2008； Wang et al., 2012； Lu et al., 2014). So, lifting the comprehensive and resource allocation efficiencies of accounting firms determines whether these firms can become stronger and larger and directly influences whether the firms can gain higher independence when they negotiate with audit clients. Furthermore, it directly affects the sound development of the capital market and economic security. Therefore, which one can more effectively promote the efficiency of accounting firms, tightening or loosening the external regulations? Whether internal governance facilitates or inhibits the improvement of the efficiency? Whether internal governance can substitute for the governance function of external regulations or not? These questions have become focuses of debates commonly concerned by the theoretical and practical circles.

The annual financial statements of more than 800 accounting firms[2] in Guangdong province from 2006 to 2016 were obtained based on the survey of the revenue of the accounting industry in the province during 2011–2015. The human resource scale involving numbers of certified public accountants (CPA), partners, and employees in a firm, and human resource cost including compensations of employees, staff welfare, and other expenses were used as the input indicators. With the total revenue and total customer number as output indicators, the data envelopment analysis (DEA) method was employed to estimate the efficiencies of accounting firms including the comprehensive, production, and allocation efficiencies. Then, the effects of government regulations and internal governance on the efficiency of accounting firms were explored employing the comprehensive efficiency as the explained variable and the government regulations and internal governance as explanatory variables. This was conducted on the basis of controlling other characteristics of the firms and the external factors of the cities where the firms are located including the economy, industry, and industrial competition. Afterwards, to test the effects of government regulations on the efficiency of accounting firms at different internal governance levels, the sign of the coefficient of interactive terms of government regulations and internal governance was investigated. In this way, the effects of internal governance on the relation between government regulations and efficiency of accounting firms were further verified. Finally, to further inspect the effects of government regulations on the efficiency of accounting firms, relevant documents were released. The Ministry of Finance and the CSRC issued and enforced the Notices on Adjusting Application Requirements for Accounting Firms Qualified for Securities-Related Business (hereinafter referred to as the No. 2 document in 2012) on 21 January 2012. In addition, the Notices on Issues Relating the Service Charges of Accounting Firms (referred to as the No. 313 document in 2011 below) released by the Price Control Administration of Guangdong Province has been formally enforced since 1 January 2012. Applying these two regulatory documents as exogenous events of the government for tightening market access regulations and price regulations of the industry, the efficiencies of accounting firms before and after 2012 were compared to reveal whether there are significant

[1] Xu. et al. (2008) stated that the average comprehensive efficiency of the top 20 accounting firms in China in 2005 (including the divisions of the big four international accounting firms (Big4 for short) in China) was merely 0.777.
Wang Yongmei et al. (2012) found that the average efficiency of Chinese accounting firms decreased from 0.659 to 0.607 from 2002 to 2010.
Lu. et al. (2014) suggested that the average efficiency of the 26 accounting firms listed in the "top 100 accounting firms in the comprehensive assessment" successively for 4 years from 2007 to 2010 was 0.85. According to the statistical data of the Chinese Institute of Certified Public Accountants, the revenue of Chinese accounting industry merely contributed 0.09% to the national GDP during 2004-2015, which was much lower than the global average level (0.24%) in the corresponding period. Moreover, the average business incomes of employees and certified public accountants in Chinese accounting firms are far lower than those of the Big4 in the same period (Chinese Institute of Certified Public Accountants, 2016). The above data indicate that relative to the optimal efficiency (equal to 1), the entire accounting industry in China still presents a low efficiency.
[2] For better expression, "firms" and "accounting firms" in the research represent the same meaning.

differences.

The results indicate that Chinese accounting firms present low comprehensive and allocation efficiencies (0.69 and 0.74 on average). The comprehensive and allocation efficiencies of accounting firms qualified for securities-related business under rigorous regulations are apparently lower than those of the firms not qualified for the business. After the implementation of the two documents, although the efficiency difference of the two types of accounting firms does not change, the comprehensive and allocation efficiencies of them are both found to have a great improvement. Especially, the strictly regulated accounting firms qualified for securities-related business exhibit a greater improvement in the efficiencies. However, the improvement is attributed to the time trend, or the technical progress in other words, instead of tightening government regulations. Meanwhile, accounting firms with better internal governance show much higher comprehensive and allocation efficiencies than those poorly governed. The accounting firms properly governed and qualified for securities-related business under stricter regulations present similar comprehensive and allocation efficiencies to the ones not qualified for the business. However, poorly managed accounting firms which are qualified for securities-related business under more rigorous regulations have obvious differences with those unqualified for the business in terms of the efficiencies. This indicates that internal governance exerts a positive regulating effect on the efficiency loss of accounting firms caused by government regulations, but not the substitution effect proposed by Cheffins (2001) and Chen et al. (2008). The research findings robustly support the hypotheses.

The research makes contributions in the following three aspects: Firstly, more accurate efficiencies of accounting firms are estimated by using the DEA method based on the microscopic input data involving human resources scale and human resources cost. The results more accurately reflect the efficiencies of accounting firms under different regulation levels, internal governance levels, organizational forms, numbers of divisions, and scales. In addition, the research reveals the real efficiency of the firms that expected to be figured out for a long time but fails due to the lack of microscopic data, and enriches the literature in the field of the efficiency of accounting firms.

Second, on the condition that the relation between tightening regulations on audit market and the efficiency of the firms is not clarified, the effects of internal governance on the relation is found to be an adjusting effect rather than the substitution effect stated in previous research. It broadens the research fields concerning the relations between government regulations and efficiency, between internal governance and efficiency, and between internal governance and government regulations, as well as the efficiency of the firms.

Finally, the research broadens the research scopes of regulatory theory and corporate governance theory in special industries (quasi-public goods and high-end service industry included). It also compensates for and enriches the literature relating the effects of government regulations and internal governance on the efficiency of accounting firms.

The rest of the research is organized as follows: Section 2 introduces the changes in the government regulations on Chinese audit market; Section 3 develops the research hypotheses based on the theoretical analysis; the research design is introduced in Section 4; Section 5 discusses the current efficiency of accounting firms; the results of the empirical test are analyzed in Section 6; and the last section concludes the research and proposes suggestions.

## 2. The changes in the government regulations on Chinese audit market

Government regulations on audit market generally include pre-event market access regulation, in-process professional standard, code of conduct, moral code, quality inspection and price regulation, and post-event punishment for violation of rules and laws (DeFond et al.,

2005； Lennox et al., 2009； Nelson, 2006； Palmrose, 2006； Yu et al., 2010). The study alternatively applies “regulation” and “supervision” in need of expression, which show the same meaning.

## 2.1. State-owned phase (1980-1994)

Since China implemented the reform and opening-up policy in 1978, Chinese accounting firms have grown out of nothing and transited from stated-owned to private ones. China carried out state-owned planned economics system before 1978. In the period, as the owner and administrator of social wealth, the government also exercised its function of supervising national economy. Thus, CPAs disappeared in Chinese economy market. After 1978, in order to meet the need for changing Chinese economics system due to foreign investment enterprises in China, the Ministry of Finance issued the Temporary Provisions on Establishment of Accounting Advisory Office on 23 December 1980. Afterwards, all-level financial departments established accounting firms, which were economic entities of staffing of government affiliated institutions[3]. They provided various accounting services for Sino-foreign joint ventures under entrustment of governments and also take charge of financial statement audit of state-owned enterprises (SOEs). It declares that the CPA system officially recovered in China.

The National Audit Office of the People’s Republic of China was established in September 1983 in charge of wealth and management of audit departments and SOEs. To further strengthen the function of economic audit, the National Audit Office issued the Notices on Issues Relating to Further Implementing of Social Auditing in January 1987 to build the economic entity–auditing firms[4] under the administrative control of the National Audit Office. Accounting and auditing firms were subordinated to different governmental departments in charge of economic supervision. However, they did not have independent property right identification and daily operations, with unclear powers and responsibilities and chaotic internal management, which caused numerous problems for economic order and industry management[5].

## 2.2. Integrated supervision and privatization phase (1995-1999)

To solve the problems in audit market triggered by multi-party management, the Ministry of Finance and the National Audit Office jointly issued the Notices on Issues Relating Chinese Institute of Certified Public Accountants and Chinese Institute of Certified Internal Auditors in June 1995. They also unified the titles, rules, and institutes at the end of 1996: firstly, CPAs and certified internal auditors are both called CPAs; secondly, Regulations on Chinese Certified Public Accountants was universally implemented; thirdly, the Chinese Institute of Certified Internal Auditors was incorporated into CICPA and became the competent institution for business of CPAs and accounting firms. The Ministry of Finance was the administrative department for approving CPAs and accounting firms.

However, auditing firms were still not independent in Chinese audit market after modification through the above unifications. The property right of firms belonged to the state while the control right was held by all-level subordinated government departments. The

[3] Compared with the public servant system, the so-called staffing of government affiliated institutions refers to a staffing mode applied by organizations which create or improve production conditions for the state, improve the social welfare and satisfy people’s various needs in culture, education and health. The expenditures belong to national operating expenses.

[4] According to *Regulations on Certified Public Accountants of People’s Republic of China* implemented on 1 October 1986, the Ministry of Finance is the competent department for examining and approving accounting firms. To avoid power conflict with the Ministry of Finance, the firms established by all-level institutions of the National Audit Office were called auditing firms to distinguish from the accounting firms under the administration of the Ministry of Finance. Therefore, the accounting firms and auditing firms co-exist in China.

[5] During 1992-1993, three shocking fraud cases of CPAs occurred in China stock markets involving embezzlement of the stockholder’s equity by Shenzhen Yuanye Company, illegal fund raising conducted by Shen Taifu, president of Beijing Great Wall Company, and huge financial fraud by Hainan Zhongshui Corporation.

business of firms was assigned and the main staff were arranged by the component organizations. However, the state undertook the auditing risk of firms in practice. Therefore, neither firms nor their component departments concerned the auditing efficiency and quality of firms, which resulted in a series of serious problems: low professional level of accountants, low auditing quality of firms and audit failure of firms. Governmental supervision authorities realized that the identity and independence of firms was one of the primary reasons causing audit failure, so they attempted to solve the problem as early as 1994. The Law on Certified Public Accountants implemented on 1 January 1994 speculated that accounting firms shall be founded under partnership or limited liability systems and also all firms shall be isolated from current adjunct organizations. This was the first time that Chinese accounting firms attempted to decouple with nationalization to become truly independent professional economic entities. However, the decoupling reform for isolating from adjunct organizations involved benefits of numerous governmental departments so that it was difficult to impel the reform. The reform was eventually put aside. After major audit frauds of financial reports of multiple listed companies and audit failure of firms successively appeared in Chinese securities markets[6], it was time to reform the property identities and independence of firms. In April 1997, the Shenzhen municipal government issued Measures for the Implementation of System Reform of Accounting Firms in Shenzhen and took the lead in implementing decoupling system reform[7]. All accounting firms were decoupled with adjunct organizations in the end of 1997. In April 1998, the Ministry of Finance issued various documents such as the Notices on Decoupling of the Accounting Firms in Securities and Futures-Related Business with Adjunct Organizations. The documents stipulated that accounting firms qualified for securities-related business shall be completely decoupled with adjunct organizations in staffing, finance, business and title before 31 December 1998. At the end of 1998, 102 accounting firms qualified for securities-related business were decoupled[8] expectedly and firms all over the country completed the decoupling in the end of 1999. Since then, accounting firms have been managed privately and independently from being controlled by the state, clarified the powers and responsibilities and acquired the autonomy for independent operation (Liu et al., 2000； Yi et al., 2002； Zhang et al., 2008). Decoupling reform actually means to change the original state-owned property right of accounting firms to private property right owned by CPAs, which greatly liberates the productive forces of firms, so Chinese accounting industry has rapidly developed since then. In order to favorably learn from the development experience of foreign firms, the Ministry of Finance issued Temporary Provisions on Sino-Foreign Cooperative Accounting Firms Management on 28 March 1996. It was approved that accounting firms can be established by international or overseas accounting firms (briefly referred to foreign collaborative firms) and Chinese accounting firms separately investing 50% in China (briefly referred to collaborative firms). Owing to foreign firms exhibit merits in brands, industrial specialties and talents, the collaborative firms were totally controlled by foreign collaborative firms. To relieve the Sino-foreign collaborative conflict, collaborative firms were transformed to division firms (briefly referred to international firms) of international accounting firms in China during the decoupling in the end of 1998 and corresponding collaborative firms were officially dismissed.

## 2.3. Reconstruction phase of supervision system (2000-2011)

[6] During 1997-1998, more serious financial frauds of listed companies and audit failure cases of firms occurred in China stock markets: false auditing reports for Qiong Minyuan Company, Hongguang Entity and Oriental Boiler.

[7] Decoupling reform is a system reform for Chinese accounting industry under special background. Decoupling refers to that firms get rid of dependence on adjunct organizations to become independent economic entity. System reform refers to that the property right ownership of firms changes from nationalization to privatization and the firms transmit from state-owned to private operated ones.

[8] There were 105 firms qualified for securities-related business before decoupling. During the decoupling reform, three firms were disqualified due to mergers and five new firms were qualified, so there were 107 firms qualified for securities-related business in the end of 1998.

The property right relation and independence of Chinese accounting firms were clearly validated after completing the decoupling reform and therefore the accounting industry aggressively developed. During the phase, Chinese audit market was small, disperse and disordered with co-existence of excessive and vicious competitions. Chinese supervision departments reconstructed the supervision system of audit market from the following three aspects:

Firstly, the government regulated the industrial competitive order. Numerous local government departments and localized firms had not changed ideas and habits of combination between governments and enterprises, so government departments had frequent direct interventions in auditing business. Therefore, the Ministry of Finance issued the Notices on Issues Relating to Reaffirming not to Interfering in the Operation of Accounting Firms According to Law through Administrative Means in March 2000. It aimed to rectify and get rid of the behaviors that local governments frequently interfere in the audit market. To improve the current status of audit market with small, disperse and disordered characteristics, the Ministry of Finance issued a series of documents including Guidance on Issues Relating to Scale Expansion of Accounting Firms and Temporary Provisions on Management for Approving the Merger of Accounting Firms in the same phase. It promoted the merger and scalization of firms. At the end of 2002, more than 300 firms had been merged in which the previous 107 firms qualified for securities and futures-related business were merged to 71 ones (Zhang et al., 2008).The scale expansion brought the economies of scale, strengthened the market competitive power and bargaining power and improved the auditing independence and quality of firms. Wu (2001) revealed that large-scale merger and reorganization of firms optimized the market structure of Chinese auditing industry, increasing the market concentrative degree. According to the statistical data of CICPA, the market share of top ten firms in Chinese audit market in terms of revenues improved to 37.15% in 2011 from less than 20% in 2000.

Secondly, the audit market access regulation was strengthened to lift the threshold of securities market. Chinese government shut down substandard firms and improved the market access standard at the same time. Surveys indicated that all-level financial departments in charge of approving the market access of firms purposely delayed the approval of applications for establishing firms to control the amount of firms in audit market. Especially in dramatically developing securities-related market, the market access threshold was gradually lifted. The Ministry of Finance and the CSRC issued two documents on the issues related to the securities and futures related business of the accounting firms in June 2000 and April 2007. The notices required the firms to improve the number of CPAs to 80 from 50, increase the agency revenues last year to 1.6×107 CNY from 8×106 CNY at least and grow net assets by 300%. In June and July 2000, the Ministry of Finance issued documents together with the CSRC and the People's Bank of China to improve the qualification of firms for carrying out securities-related business and the market access threshold of firms qualified for financial auditing business. Under the market regulations, including reducing the application approval for new firms, accelerating cancellation of firms and improving market access threshold, and the policy guidance promoting mergers of firms, the numbers of firms especially firms qualified for securities-related business dramatically decreased[9].

Thirdly, industrial system and supervision system constructions were tightened. In order

[9] The firms qualified for securities-related business decreased from 107 in 1998 to 78 in the end of 2000, 71 in the end of 2002 and 43 in the end of 2012 during decoupling reform. The firms qualified for the business decreased to 40 ones after implementing the No. 2 document released by the Ministry of Finance and the China Securities Regulatory Commission in 2012 (Liu et al., 2000; Zhang et al., 2008). The merger of firms is one of the reasons causing the reduction of firms while it aims to meet the requirements of supervision departments for income scale, the number of CPAs and other basic conditions. Surveys suggested that in order to support part of large-scale firms to be powerful, the Ministry of Finance and China Securities Regulatory Commission did not approve the applications for securities business any longer but encouraged current firms qualified for securities-related business to merge (the above No. 2 document encouraged mergers). Therefore, the number of firms qualified for securities-related business greatly declined.

to standardize the personal professional standards of CPAs, the Ministry of Finance and the entrusted management institution, CICPA, formulated multiple documents in this phase: 48 items of professional guidance in Guidance on Professional Norms of Chinese Certified Public Accountants, 22 items of norms in Basic Codes of Chinese Certified Public Accountants for Assurance Services, 38 items of norms in No.1101 Auditing Standard of Chinese Certified Public Accountants–Overall Goal of Certified Public Accountants and Basic Requirements of Auditing Works and Rules of Professional Conduct of Chinese Certified Public Accountants. To uniform the behaviors and professional qualities of accounting firms, the government formulated and implemented System for Inspecting Practice Quality of Accounting Firms (amended separately in December 2006, October 2008, July 2009 and July 2011). According to the document, the practice qualities of firms were selectively inspected according to a certain proportion. The government formulated and implemented Punishment Rules for Illegal Professional Conducts of Members with Chinese Institute of Certified Public Accountants to enlarge the penalty forces on illegal behaviors including ineffective governance and constraint on firms and lack of diligence of CPAs. Afterwards, the government officially implemented Guidance on Internal Governance for Accounting Firms. It aims to guide firms to strengthen self-discipline, establish and perfect the internal governance and quality control system, and guarantee that the rapid development of firms is coordinated with risk control and quality assurance.

## 2.4. Phase of completely strengthening regulations (2012 to present)

In this phase, China implemented One Belt and One Road strategy and accounting industry is faced with the national mission: developing in the world. To adapt to the international competitive environment, Chinese government fully tightens industrial regulation and supervision, especially strictly supervising the firms qualified for securities-related business. Firstly, the government greatly improves the market access threshold of securities and futures-related business. The No. 2 document in 2012 lifts the market access threshold of securities and futures-related business: The number of CPAs in firms qualified for securities-related business increases from 80 at least to 200. The accumulative professional risk reserve rose to 8×107 CNY from 6 ×106 CNY at least. The agency revenue last year grows to 8×107 CNY from 1.6×107 CNY at least; The required number of partners increases to 25 at least from 2 at least; The organizational form changed to the special or general partnership system from the unlimited one. The government lifts the access threshold of securities market to prevent a batch of new entrants so that the firms qualified for securities-related business can exclusively benefit from the development and expansion of capital market. Secondly, the government strengthens the price regulation in audit market. The National Development and Reform Commission and the Ministry of Finance jointly issued the Administrations on Service Charges of Accounting Firms. On this basis, the CICPA issued the Notices on Strictly Striking and Governing the Inappropriate Low-Price Competitive Behaviors in Certified Accounting Industry to require each province to formulate specific guiding price of auditing business. In order to respond to the requirements, all firms in Guangdong province took the guiding price formulated by the government in No.313 document in 2011 as the pricing standard. The guiding price formulated by the government is supported by a majority of mid-small firms while is harmful to the brand firms accepted by the market to acquire ideal brand premium. Thirdly, the government comprehensively strengthens the inspection on practice qualities and penalty on illegal professional behaviors for firms. In this phase, the CICPA makes great efforts to make quality inspection on financial statements of listed companies audited by firms qualified for securities-related business, more than 50% of which were inspected every year. Local institutes of CPAs take responsible for inspecting the auditing qualities of the firms

unqualified for securities-related business, about 20% of which are inspected every year. Fourthly, industrial policy guidance is strengthened. The CICPA successively issued Measures Supporting Accounting Firms to Grow Stronger and More Powerful and Guidance on Brand Construction of Accounting Firms and further set multiple incentive rewards. By taking the comprehensive evaluation of accounting firms as a basis and focusing on strengthening internal governance and quality control, the government enhances supervision and guidance on firms especially on firms qualified for securities-related business. Fifthly, the audited organizations are regulated to reduce the business risk. The CICPA successively implemented 18 items of supporting guidance such as those in Basic Norms for Internal Governance of Enterprises and Auditing Guidance on Internal Control of Enterprises. They aim to guide the listed companies to strengthen internal governance and quality control construction and reduce risks of auditing failure.

To sum up, the development of Chinese accounting firms is always macroscopically guided by the government and especially the firms qualified for securities-related business are always powerfully regulated and strictly supervised. Government regulations have transformed from direct participation to indirect participation and from pure administrative regulations to comprehensive regulations by combining three links: pre-event market access regulation, in-process supervision and post-event penalty in terms of forms. The government attempts to build and improve a sound external development environment of firms by implementing rigorous external regulations and enhancing institutional arrangement of internal governance and policy guidance. By doing so, it can promote constructions of firms, strengthen internal governance and quality control mechanisms and lift production and resource allocation efficiencies of accounting firms. The ultimate goal is to further improve the current development status of Chinese accounting firms: small scale[10], weak strength[11] and low efficiency (Xu et al., 2008； Wang et al., 2012； Lu et al., 2014).

## 3. Theoretical analysis and hypothesis development

Classical economics points out that market regulation can automatically regulate resource allocation while the government only acts as a night watchman. Classical economics also suggests that market automatically regulates the resource allocation on the premise of a completely competitive effective market while the premise hardly exists in the real world. Keynesianism believes that strengthening the interference of government on market can relieve the inefficiency of resource allocation brought by market failure. The public interest theory on construction reveals that the government can improve the market competition and efficiency and realize the Pareto optimality of social welfare by decreasing industrial information asymmetry through industrial supervisions and compensating for the failure of market mechanism (Stiglitz et al., 1977； Viscusi et al., 2005). Thus, regulation and supervision are regarded as necessary means to overcome inherent defects of free market economy and realize various value goals such as social justice.

Regulation economics illustrates that government regulations can solve the market failure to some extent while they can also lead to regulation failure due to market monopoly, which also results in the efficiency loss. The theory of regulatory capture in grabbing hand holds the point of view that a government has self-interest inconsistent with the public interest. When the needs of subordinates for regulation are consistent with the self-interest of

[10] Chinese Institute of Certified Public Accountants, Report on Development of China Certified Accounting Industry (2015). Beijing: China Financial & Economic Publishing House, 2016. 12: 62-107. The report pointed out that the firms (565) in 2015 with the total revenue more than $1\times10^7$ CNY only took up 6.6% of the total number of accounting firms.

[11] During 2011-2015, the market shares of the first ten firms in top 100 Chinese accounting firms were 37.21%, 37.95%, 37.44%, 38.57% and 39.24%, respectively. Frankel, Johnson and Nelson (2002) pointed out that the market share of Big4 in the United States was 90.44%. Huang, Chang and Chiou (2016) revealed that the market share of Big4 in 2011 in the world was 90.8%.

regulators, it is easy for regulators to formulate the regulatory policy favorable for subordinates but not for public interest. Consequently, the relation between investment opportunities and behaviors is distorted, resulting in losses of decision-making and resource allocation efficiencies (Posner et al., 1974；North et al., 1990；Chang et al., 2014；Karpoff et al., 2010； Shin & Kim, 2002； Li et al., 2014； Li et al., 2015). Regulation and rent-seeking theory deems that rents are caused by regulations in regulated industries, paid by consumers but grasped by regulators and subordinates. If the rental incomes are higher than costs for acquiring rents, the supply-demand market of regulation is formed between the regulators (politicians) and subordinates (operators) and therefore their pursuit for rents can lead to the deviation of policy target of regulations deviates from the efficiency maximization and welfare optimization (Stigler, 1971； Hart et al., 2008； Fehr et al., 2011； Chen et al., 2009； Xu et al., 2013). The developing histories of world economy and development practices of Chinese economy have demonstrated that the government regulation is in favor of industrial development while not completely favorable for improvement of production efficiency. Therefore, how to balance the relation between government regulations and efficiencies becomes a focus problem disputed by policymakers and scholars.

Chinese accounting industry is also faced with the balance problem between regulations and efficiencies. According to the theory of public interest put forward by Stigler et al. (1971), the target routes of the government regulation on accounting industry are displayed in following two points: on the one hand, the government restricts competitions of accounting industry by using licensing system to keep the stability of current firms and thereby maintain the franchise value of these firms, which can finally improve the security of capital market. On the other hand, the government formulates certificate standard for qualification of CPAs and quality control specification for firms to guarantee the service qualities of firms and CPAs. If firms and CPAs cannot satisfy the target quality, the government can implement severe penalty: revoking the licensing or qualifications of firms and CPAs, implying that firms and CPAs lose the excessive quasi-rents of licensing. The reward and punishment regulation measures (pre-event permission and post-event penalty) show great advantages: accounting firms can establish high-quality auditing reputation mechanism, correct the market competitive mechanism, reduce the information asymmetry of audit market and ensure improvement of auditing efficiency and quality of firms. On this basis, the public interest and social welfare of the whole society can be optimized (Yu et al., 2010). However, in the viewpoint of the theory of regulatory capture proposed by North et al. (1990) and the regulation and rent-seeking theory put forward by Hart (2008) and Fehr et al. (2011), the government generally transfers resources to firms associated with the government through regulations to acquire rents while pursuing self-profit maximization. Therefore, the government is generally captured by subordinates during regulations, sets a certain monopoly qualification for subordinates in order to improve industrial barriers and guarantee the monopoly profits of subordinates. By doing so, the market efficiency is damaged (Stigler, 1971). Relevant researches indicated that implementing rigorous market access regulation in audit market aims to standardize the market competition and promote market efficiency while it is not favorable for improving the efficiency of audit market (Wang et al., 2008； Yu et al., 2010； Zhang, 2005). If firms show the characteristics of small scale, weak strength and low efficiency, the imbalance appears between firms and audit clients during negotiation. And also, the firms probably conduct low-price competition or compromise with clients, which results in the reduction of auditing quality. On the other hand, low efficiency of firms directly affects the performance-related income and reputations of accountants and also decreases the input of auditors, which influence the auditing quality eventually (Huang et al., 2016； Eshleman et al., 2017). Therefore, the government regulation causes that firms decrease

efficiencies and concern the auditing quality, and induces firms to seek for government's aegis and rent-seeking. Consequently, it causes the efficiency reduction and even decreases the auditing quality (Chen et al., 2002). In the period of socio-economic transition, the Chinese government comprehensively promotes and deepens economic system and administrative service reforms. The reforms focus on authorizing and reducing unnecessary administrative examination and approval, industrial regulation and direct interference to microscopic behaviors which are harmful for liberating productivity and improving production and allocation efficiencies. Therefore, it is deemed that relieving the government regulation has been acknowledged by the Chinese government from top to down and strengthening the government regulation is not in favor of improvement of efficiencies. Therefore, the hypothesis 1 is proposed:

H1: others being equal, Government regulations are negatively related to the efficiency of accounting firms.

The practical experience of China's economic development manifests that development is a top priority while not developing will bring the largest risk. The primary goal and function of the internal governance of a corporation is to promote its development. Existing literature indicates that proper internal governance of a corporation can improve corporate efficiency (Bertrand et al., 2003； Billett et al., 2011； Dittmar et al., 2007), effectively inhibit inefficient investment (Giroud et al., 2011； Fang et al., 2013； Yang et al., 2010； Yu，2010； Zhang et al., 2012), and optimize resource allocation efficiency (Bates et al., 2005； Li et al., 2011) by reducing information asymmetry and agency cost. As the service of accounting firms has the nature of quasi-public goods (competitiveness and non-excludability), the internal governance of the firms concerns the public governance of private sectors (Wu et al., 2012). However, as accounting firms are professional organizations based on talent and intelligence aggregation, obviously it is not wise to copy the internal governance mode of organizations of pure public goods and pure private goods. The internal governance of the firms is a process that professionals autonomously coordinate core resources, that is, a process of partners' self-governance (Greenwood et al., 1990, 2005； Wu et al., 2012). According to the self-governance theory[12], the overuse of common-pool resources will lead to resource degradation. Therefore, each user is willing to manage common pools and has virtual principal-agent relationship with other users. The internal governance of accounting firms highly coincides with the self-governance and all partners of the firms shared the brand and other common resources non-exclusively. Therefore, there are principal-agent relationships between partners and between CPAs of partners and non-partners. Meanwhile, according to relevant provisions in the Guidance for Internal Governance of Accounting Firms issued by the CICPA[13], accounting firms shall set a decision-making, management, supervision and governance control system. The system needs to be mainly composed of the board of shareholders (partner meeting), board of directors (partner management committee),

[12] The theory was proposed by American scholar Elinor. Ostrum in 1990. The theory supposes that, at first, common-pool resources are quasi-public goods with competitiveness and non-excludability and second, the users of common pools are interdependent principals. The core content of the theory is to study how a group of interdependent principals organize themselves to carry out autonomous governance, so that they can achieve everlasting common income when all resource consumers confront opportunistic behaviors such as free ride and avoidance of responsibility (Wu et al., 2012).

[13] Article 6 in *Guidance for Internal Governance of Accounting Firms* stipulates that internal governance of the firms needs to focus on enhancing internal harmoniousness to reasonably dispose and effectively coordinate relations between shareholders (partners), between shareholders and CPAs, between employees and between other interested parties. The internal governance should give full play to the functions of management organizations at each level and guarantee legal interests of each stakeholder in the firms. Articles 28 and 29 stipulate the voting mode and decision-making procedure of the board of shareholders in accounting firms, respectively. The establishment, power, and particular cases relating the board of shareholders of accounting firms are listed in Article 30. Articles 36 and 40 present the establishment, rights and liabilities of the board of supervisors and chief accountants, respectively. Chief accountants in partnership accounting firms are partners that execute business affairs; while legal representatives hold the post of chief accountants in limited liability accounting firms and they are selected from the directors. Therefore, chief accountants are equivalent to CEO of the firms.

board of supervisors, and chief accountants[14]. The members of boards of shareholders, directors, and supervisors shall have a CPA certificate. Therefore, in accounting firms based on talent and intelligence aggregation and with CPAs as the core resources and capital, partners, as the core members in top decision-making and management, undertake governance functions of the boards of shareholders, directors, and supervisors. For this reason, the relative scale of partners plays an important incentive role in internal decision-making, management, and governance control of accounting firms. The governance incentive is mainly shown in the following two aspects: one is that becoming partners is the ultimate goal of most CPAs in their career development and the relative scale of CPAs presents the career growth opportunity of employees, thus reflecting the incentives of the firms to employees. It is also in favor of attracting and retaining outstanding employees; and the second is that most partners need to fulfill the task of business development, so the more the partners in a firm, the more the output is and the easier can the firm obtains scale economy and scale efficiency.

The internal governance mechanism centered on the board of directors in a corporation imposes significant effects on the corporate efficiency (Richardson et al., 2006). With respect to the supervision mechanism, improving the structure and the supervising function of the board of directors contributes to the reduction of agency cost, and therefore promotes the decision-making efficiency and resource allocation efficiency of a corporation. Playing large shareholders' supervisory role in the agency behavior of managers is also conducive to elevate the capital allocation efficiency of companies. As to the incentive mechanism, increasing the reward or the proportion of shareholdings of managers in the investment can strengthen the consistency between the interests of investors and managers and remit agent problems of managers, thus lifting production efficiency and resource allocation efficiency (Li et al., 2011). Based on this, the hypothesis 2 is proposed:

H2: others being equal, the internal governance of accounting firms is positively related to the efficiency of the firms.

In the institutional environment where the ownership and the management right are separated, corporate governance provides a system design which can effectively relieve information asymmetry and principal-agent issues. Government regulations, as a form of external governance of listed companies, its ultimate purpose is to remedy the governance failure caused by improper internal governance such as insider control. As mentioned above, if government regulations can lead to the decline of firm efficiency, accounting firms with different levels of internal governance have dissimilar governance failure problems and respond in different manners to government regulations. Consequently, these firms have great differences in the degree of efficiency loss. Considering that internal governance positively influences the efficiency of accounting firms, it is believed that internal governance at a proper level is able to reduce the efficiency loss resulting from government regulations. Therefore, the hypothesis 3 is put forward:

H3: others being equal, Internal governance at a proper level is able to lower the efficiency loss caused by government regulations.

# 4. Research design

## 4.1. Sample selection

On the basis of studying the revenues of accounting industry in Guangdong province from 2011 through 2015, the authors obtained detailed financial data of accounting firms in

[14] According to Articles 30 and 36 in *Guidance for Internal Governance of Accounting Firms*, small accounting firms do not absolutely need a board of directors and a board of supervisors, but one executive director and one to two supervisors are enough.

the province reported to the CICPA in 2006~2016. After organization, the annual and city-level unbalanced panel data of 712 and 5125 accounting firms were attained, respectively.

As the most developed province in China, Guangdong province realized a total GDP of 7.95×1012 CNY in 2016, which was 1.15788×1012 dollars at 2016 average exchange rate. It was merely 9.428×1010 dollars less than that of Spain whose GDP was ranked the 14th and even 9.427×1010 dollars more than that of Mexico with its GDP ranked the 15th in the world[15]. The GDP of Guangdong province in 2016 accounted for 10.7% of the total GDP of China in the year and the province was always ranked the first among Chinese provinces in terms of the GDP for successive 28 years. The revenue of accounting industry in the province always keeps above 10% in the total revenue of the industry in China in recent years. The number of accounting firms in Guangdong province in recent five years maintains above 800 ones, which is about 10% of the total quantity of accounting firms in China. As for the scale, there are more than 13 large accounting firms whose total revenue exceeds 1×108 CNY in recent five years and their total revenue holds 45% around in that of the accounting industry in the province; there are about 70 middle-sized accounting firms with a total revenue in the range of 1×107~1×108 CNY and their total revenue is about 28% of that of the industry in the province; the number of small-sized accounting firms whose total revenue keeps below 1×107 CNY accounts for 90% of the total number and the total revenue of these firms makes up 25% of that of the industry in Guangdong province. In terms of the industry concentration, the total income of accounting firms whose revenues were ranked the top 50 (referred to as Big50) of all firms in the province accounted for 66.46%, 59.22%, 58.75%, 64.26%, and 66.52% of the total industry revenue from 2011 to 2015, respectively[16]. The total revenue, number, scale, and industry concentration of accounting industry in Guangdong province are basically matched with the economic status of the province in China and are close to the basic characteristics of the whole accounting industry of the nation. For this reason, using data of accounting firms in Guangdong province to study the influences of government regulations and internal governance on the efficiency of accounting firms can favorably reflect the real situation of the whole accounting industry in China.

## 4.2. Research method and modeling

### 4.2.1. First stage: DEA estimation

DEA, an efficiency evaluation method proposed by famous American operational research expert Charnes et al. (1978) , is widely used for efficiency evaluation in economics, management, and system engineering. It is difficult to build a production function for accounting firms in the professionalized service industry. Compared with the parameter estimation method of stochastic frontier analysis (SFA) , DEA is an effective non-parametric estimation method that does not need an explicit production function but can provide information for finding low-efficiency links (Banker et al., 2005). The research of Kim et al. (2006) also found that DEA can effectively measure audit efficiency. Therefore, the research applies DEA rather than SFA to estimate the efficiency of accounting firms. By referring to the methods of Banker et al. (2005), Wang et al. (2012), and Lu et al. (2014), the research carries out DEA estimation of the production efficiency of accounting firms adopting their specific statement data and the Deap2.1 software with the variable return to scale (VRS,

[15] Total GDP of Guangdong province in 2016: successively ranked the first in China for 28 years and a small gap with that of Spain, http://www.mrcjcn.com/n/203717.html [accessed on 26 February 2017].

[16] The total income of accounting firms whose revenues were ranked the top 10 in Guangdong province accounted for 38.81%, 32.92%, 34.44%, 37.86%, and 38.22% of the total industry revenue of the province in 2011~2015; and that of the top 100 accounting firms in terms of their incomes in the province was 75.58%, 68.80%, 68.18%, 73.36%, and 75.70% of the total industry revenue in 2011~2015. The top 50 accounting firms (Big50) ranked according to their revenues occupy two thirds of the market share, so they show higher statistical significance. For this reason, the research chose Big50 as the measurement index for the scale of accounting firms.

output maximization with fixed input). In the process, the human resource scale (numbers of CPAs, partners, and employees) and human resource cost (compensations of employees, staff welfare, and other expenses) are used as input factors and the revenue and customer number as output factors. Moreover, the output-oriented VRS BCC model is utilized (Banker et al. 1984; 2005). Afterwards, the estimated efficiency is used as the explained variable in the second stage–Tobit panel regression. The input and output variables in the DEA non-parametric estimation of efficiency of accounting firms are defined in Table 1.

### 4.2.2. Second stage: Tobit panel regression

Adopting the comprehensive efficiency of accounting firms estimated in the first stage as the explained variable, the Tobit regression models of panel data are established. Then, the relations among government regulations (QSB), internal governance (DUM_partner), and comprehensive efficiency (Crste) of accounting firms are tested according to years and cities while other organization characteristics and external environment factors are under control. The models are shown as follows:

$$\text{Crste} = \alpha_0 + \alpha_1 \text{QSB} + \alpha_2 \text{DUM\_partne r} + \sum \text{contr\_vars} + \sum year + \sum city + \varepsilon \quad (1)$$

$$\text{Crste} = \beta_0 + \beta_1 \text{QSB} + \beta_2 \text{DUM\_partne r} + \beta_3 \text{QSB} \times DUM\_\text{Partner} + \sum \text{contr\_vars} + \sum year + \sum city + \varepsilon \quad (2)$$

Model (1) is used to verify H1 and H2, and it is anticipated that α1 and α2 are significantly negative and significantly positive, respectively. Model (2) is established for validating H3, for which β3 is estimated to be significantly positive. To avoid the interface of outliers to the regression results, all sample data of continuous variables are subjected to Winsorize processing at the level of 1%. Regression analysis is carried out using the Stata12.

**Table 1.** The definition of variables to estimate firm efficiency

| Variable type | Variable | Symbol | Unit |
|---|---|---|---|
| Human capital investment | Number of CPA | CPA | Person |
| | Number of Partner | Partner | Person |
| | Number of Employee | Employee | Person |
| Human cost investment | Salary input | Salary | Million RMB |
| | Welfare input | Welfare | Million RMB |
| | Otherpay input | Otherpay | Million RMB |
| output | Number of Totalrevenue | Totalrevenue | Million RMB |
| | Number of Totalcustomer | Totalcustomer | Number |

## 4.3. Variable Selection and Definition

### 4.3.1. Dependent Variable

The efficiency of accounting firms estimated using the DEA method consists of three ones: technical efficiency (i.e. comprehensive efficiency, Crste), pure technical efficiency (i.e. productivity, Vrste), and scale efficiency (i.e. allocation efficiency, Scale). Technical efficiency is the product of pure technical efficiency and scale efficiency and refers to comprehensive efficiency. Pure technical efficiency reflects the level of productivity of

accounting firms. The technological level of accounting firms did change from 2006 through 2016 while no fundamental changes were found, so the pure technical efficiency possibly varies slightly. Scale efficiency describes the resource allocation efficiency of firms and the incentive effect of the organizational system of accounting firms can probably lead to large differences in resource allocation efficiency of different firms. Therefore, comprehensive efficiency Crste is adopted as the explained variable of Models (1)~(3), while allocation efficiency (Scale) is used as the substitutive explained variable for the robust verification of these models.

## 4.3.2. Independent Variables

(1) Government regulations (QSB). Government regulations on the audit market generally include pre-event market access regulations, professional standard, code of conduct, moral code, quality inspection, and price regulations during events, and post-event punishment for violation and illegality (DeFond et al., 2005； Lennox et al., 2009； Nelson, 2006； Palmrose, 2006； Li et al., 2010). The securities and futures market is the major constitution of the capital market and companies having transactions on the market are public companies (or listed companies), which involve numerous interest-related parties. Owing to these companies are highly concerned by the public and have wide influences, the securities and futures market is more toughly regulated and supervised by the supervision department. As mentioned above, the supervision department sets a high market access threshold for accounting firms entering the market. The firms qualified for securities-related business are more strictly supervised by the department compared with those not qualified for the business while they exclusively enjoy more opportunities brought about by the development of the capital market. For example, the CICPA carries out special examinations for the audit quality and financial statements of listed companies every year with coverage higher than 50%. It even devotes great effort to inspect the daily operation behavior and process of accounting firms qualified for securities-related business. While accounting firms not qualified the securities-related business are selectively examined by local CPA institutes and the annual examination coverage is less than 20%. Especially since 2012, the Chinese government has implemented the price regulations on the whole audit market and enhanced the inspection frequency and intensity for the execution of accounting firms while strengthening the market access regulations on securities business. It can be seen that accounting firms qualified for securities-related business show audit service premium due to price regulations while benefiting from the market access regulations and are exposed to tougher execution supervision compared with those not qualified for the business. At present, the practical and theoretical circles still have not figured out the consequences of comprehensively enhancing government regulations. To investigate the relations between government regulations and efficiency of accounting firms, whether an accounting firm is qualified for securities-related business or not is adopted as the substitutive index for judging the intensity of government regulations and represented by QSB. If it is qualified, that is, it has the qualification for securities and futures business, QSB is 1 and it is toughly regulated; otherwise, QSB is 0 and it is under light regulations.

(2) Internal governance (DUM_Partner). Listed companies have a complete internal governance system formed by administrative organizations such as the boards of directors and supervisors and their operation system. However, the internal governance of accounting firms based on talent and intelligence aggregation differs from those listed companies aggregated by capital, and it mainly relies on the operation and management of the firms, mutual supervision, and self-discipline of partners. Among the measurement indexes for corporate internal governance, the scale of the board of directors is one of the most commonly used indexes. The scale of the board reflects the representativeness of each

interest group in a corporation, and it is generally considered that the larger the scale is, the more democratic the decision-makings of the corporation, which can promote the resource allocation efficiency to certain extent (Hermalin et al., 1988； Lynall et al., 2003). It is also believed that there is an optimal scale of the board of directors, and an oversize scale can cause the reduction of decision-making efficiency on the contrary (Fama et al., 1983； Rosenstein et al., 1997； Li et al., 2007). In accordance with relevant provisions in Guidance for Internal Governance of Accounting Firms released by the CICPA[17], accounting firms shall establish a decision-making, management, supervision and governance control system. The system needs to be mainly composed of the board of shareholders (partner meeting), board of directors (partner management committee), board of supervisors, and chief accountants[18]. The members of boards of shareholders, directors, and supervisors shall have a CPA certificate. Partners, as the core members in top decision-making and management, fulfill governance functions of the boards of shareholders, directors, and supervisors. Therefore, the relative scale of partners plays an important role in internal decision-making, management, and governance control of accounting firms. For this reason, the relative scale of partners is chosen as the measurement index for internal governance of accounting firms: the larger the relative scale is, the better the internal governance; and vise versa.

### 4.3.3. Control variables

During the survey on the revenue of accounting industry of Guangdong province during 2011~2015, many variables were controlled according to common responses from partners of accounting firms and relevant literature. The variables include internal features that possibly affect the efficiency of accounting firms and external environment characteristics. The former involves organizational form (Org_form), being a division or not (Divisions), scale (Big50), degree of specialization (CPA_g), and business concentration (Busi_con) of the firms. The latter includes the regional GDP index, industry concentration (HHI), and industrial agglomeration (CYJJ) which reflects the economic development level and trend, industrial competition degree, and industry activity of the place where the firms are set, respectively. Limited by the length of the paper, the selection and analysis of the control variables are omitted. The regional effect and time effect are compared in different cities and years. Relevant variables involved in the regression model are defined in Table 2.

**Table 2.** Definitions of variables

| Variable | Symbol | Predicted direction | Definition |
|---|---|---|---|
| **Explained variables dependent variable** | | | |
| Comprehensive efficiency | Crste | | Technical efficiency, estimated by means of DEA and equivalent to the product of pure technical efficiency and scale efficiency |
| Allocation efficiency | Scale | | Scale efficiency, estimated by virtue of DEA |
| **Explanatory variables independent variable** | | | |

[17] Article 6 in *Guidance for Internal Governance of Accounting Firms* stipulates that internal governance of the firms needs to highlighting internal harmoniousness to reasonably dispose and effectively coordinate relations between shareholders (partners), relations of shareholders with CPAs and employees and relations of other interested parties. The internal governance should give full play to the functions of management organizations at each level and guarantee legal interests of each stakeholder in the firms. Articles 28 and 29 stipulate the voting mode and decision-making procedure of the board of shareholders in accounting firms, respectively. The establishment, power, and particular cases relating the board of shareholders of accounting firms are listed in Article 30. Articles 36 and 40 present the establishment, rights and liabilities of the board of supervisors and chief accountants, respectively. Chief accountants in partnership accounting firms are partners that execute business affairs; while legal representatives hold the post of chief accountants in limited liability accounting firms and they are selected from the directors. Therefore, chief accountants are equivalent to CEO of the firms.

[18] According to Articles 30 and 36 in *Guidance for Internal Governance of Accounting Firms*, small accounting firms do not absolutely need a board of directors and a board of supervisors, but one executive director and one to two supervisors are enough.

| | | | |
|---|---|---|---|
| Government regulations | QSB | - | Dummy variable. It is 1 for accounting firms qualified for securities-related business and reflects tough government regulation; otherwise it values 0. |
| Internal governance | DUM_Partner | + | Dummy variable, reflecting relative scale of partners and equivalent to the ratio of the number of partners to that of employees. It values 1 when larger than the median which means proper internal governance; and vise versa. |
| **Control variables** | | | |
| Organizational form | Org_form | + | Dummy variable. It values1 for partnership firms (special general partnership firms included); otherwise it is 0. |
| Division | Divisions | + | Dummy variable. It is 1 if an accounting firm is a division; otherwise it is 0. |
| Scale | Big50 | - | Dummy variable. It values 1 for accounting firms among the top 50 ones (Big50) ranked by the Guangdong provincial CPA association; otherwise it is 0. |
| Degree of specialization | CPA_g | + | Equivalent to the ratio of the number of CPAs to that of employees, and the higher the ratio, the higher the degree of specification. |
| Business concentration | Busi_con | - | Equivalent to the ratio of the revenue of audit service to the total revenue. |
| Regional economic level | GDPindex | + | Equivalent to the GDP index of each prefecture-level city. |
| Regional industry concentration | HHI | + | HHI index of accounting industry in each prefecture-level city. The larger the index is, the higher the concentration and the lower the competition; and vise versa. |
| Regional industrial agglomeration | CYJJ | + | The ratio of the number of accounting firms in the place to the total number of accounting firms in Guangdong province. |
| Time trend | POST | ? | It values 1 or 0 for sample data posterior or prior to 2012. |
| City | City | | Regional effect |
| Year | Year | | Annual effect |

## 5. Current efficiency of accounting firms in China

It can be seen from Table 3 that the average comprehensive efficiency (Crste) of accounting firms is 0.69, which lags far behind the optimal technical efficiency (Crste=1). The average productivity (Vrste) is at a high level (0.93), while the average allocation efficiency (Scale) is not high (0.74). Effchange represents the change trend of comprehensive efficiency of accounting firms, and valuing 0, 1, or 2 denotes that the comprehensive efficiency progressively decreases, keeps unchanged, or progressively increases, respectively. The comprehensive efficiency of more than a half of accounting firms (87.4%) declines progressively, that of 10.85% of the firms is not changed, while the comprehensive efficiency of merely 1.75% of the firms augments progressively. Among the input factors, the numbers of CPAs, partners, and employees all exceed the medians in terms of the human resource input, which indicates that the core resources of Chinese accounting firms are highly disperse. This conforms to the current condition of Chinese accounting firms, that is, they are small, disperse, and disordered. The minimal numbers of partners and CPAs in accounting firms are both 1, because these firms are divisions. Existing laws and regulations do not have specific stipulation on the numbers of partners and CPAs in a division of accounting firms. It also suggests that these accounting firms have a low degree of specification. As to the capital input, different accounting firms show great differences on the whole, especially in Welfare and Otherpay whose mean values are all larger than the medians and present great differences. This implies that the samples are significantly influenced by some outliers, which to some extent, indicates that the cost structure of accounting industry has large differences. With respect to the output, the mean values of Totalrevenue and Totalcustomer are far larger than

the medians, suggesting that the samples are greatly affected by outliers and Chinese accounting firms currently have low industry concentration and are not large and strong.

**Table 3.** Descriptive statistics of input-output efficiency of CPA firms

| Variable | Obs | Mean | Std. Dev. | Min | Med | Max |
|---|---|---|---|---|---|---|
| Crste | 5125 | 0.692 | 0.175 | 0.412 | 0.659 | 1 |
| Vrste | 5125 | 0.933 | 0.049 | 0.8 | 0.933 | 1 |
| Scale | 5125 | 0.739 | 0.168 | 0.432 | 0.724 | 1 |
| Effchange | 5125 | 0.144 | 0.398 | 0 | 0 | 2 |
| Totalrevenue | 5125 | 8.358 | 29.1 | 0.000 | 2.068 | 387 |
| Totalcustomer | 5125 | 536.035 | 721.964 | 1 | 336 | 13848 |
| CPA | 5125 | 11.989 | 16.256 | 1 | 7 | 227 |
| Employee | 5125 | 30.086 | 61.346 | 1 | 16 | 769 |
| Partner | 5125 | 3.611 | 2.972 | 1 | 2 | 80 |
| Salary | 5125 | 2.978 | 12.1 | 0.000 | 0.747 | 173 |
| Welfare | 5125 | 0.168 | 1.545 | 0.000 | 0.01 | 78.8 |
| Otherpay | 5125 | 2.161 | 7.623 | 0.000 | 0.423 | 156 |

Figure 1 shows the comprehensive efficiency (Crste), productivity (Vrste), and resource allocation efficiency (Scale) of the sample accounting firms during 2006 and 2016, as well as the change trend of the efficiencies: keeping unchanged, increased, or decreased. It can be seen from the figure that the comprehensive efficiency (Crste) is in the range of 0.625-0.864, much lower than the optimal efficiency 1, and it continuously grows but with large fluctuations. The resource allocation efficiency (Scale) ranges from 0.676 to 0.906, also shows a large difference with the optimal efficiency 1, and its overall trend is completely consistent with that of Crste. Owing to the technologies for business operation did not change fundamentally in the past more than 10 years, the productivity (Vrste) of accounting firms does not change greatly, but basically at a high level in the range of 0.91-0.96. The mean value of Effchange which reflects the change trend of the efficiencies is 14.36%, implying that the comprehensive efficiency of merely 14.36% sample accounting firms is unchanged or improves progressively. In other words, the comprehensive efficiency of the other 85.64% accounting firms progressively decreases. The comprehensive efficiency (Crste), productivity (Vrste), and allocation efficiency (Scale) of 127 accounting firms which were selected as the samples in the successive 11 years show basically same ranges and change trends with the whole samples. In addition, the mean value of Effchange that reflects the change trend of the efficiencies is 7.73%, indicating that the comprehensive efficiency of merely 7.73% of sample accounting firms (10 ones) is unchanged or grows progressively.

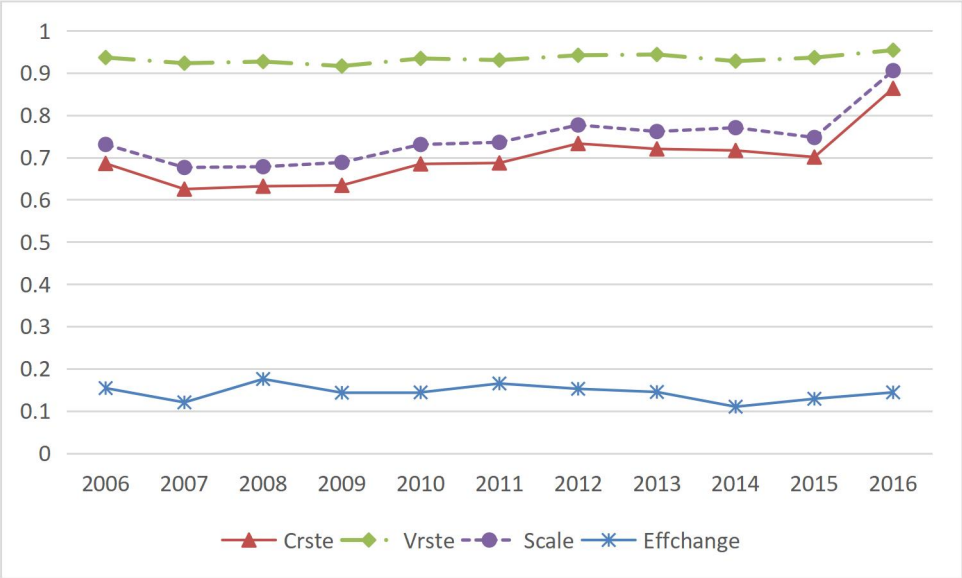


**Figure 1.** Efficiency trends of 2006-2016 year sample offices

# 6. results

## 6.1. Descriptive statistics

Plane A in Table 4 displays the descriptive statistics of various variables in the whole sample. It can be speculated through the data that only 9.33% of firms are qualified for securities and futures-related business, higher than the national average level (7.71%), and 50.32% of firms show favorable internal governances. In terms of control variables, there are almost 60% of firms adopt partnership system in organizations while 10.19% of firms are divisions. The firms ranked top 50 in Guangdong province take up 10.73% and the mean of relative scale of CPAs is 35%, representing the professional levels of firms. The mean proportion of audit business (namely, business concentration) in revenues of firms reaches to 71%, which conforms to the national average level. In terms of external environmental factors, the means of economic development levels (GDPindex) of various regions are slightly larger than medians, implying that GDP growth in different regions shows significant difference. Additionally, the mean of HHIs of firms in different regions is 0.0053, which is consistent with the current status: the revenues of firms in Guangdong province mainly come from Guangzhou and Shenzhen (the sum of market shares of the two cities were up to 83% in 2015). And also, it basically conforms to the current industry concentration of Chinese accounting firms[19]. The mean of CYJJ of firms is 18%, indicating a low agglomeration level. Moreover, 44.62% of samples are taken after implementing the two regulation documents, so the sample sizes before and after implementing the two regulation documents are at a similar level.

It can be seen from Panels B, C and D that the comprehensive and allocation efficiencies of the firms qualified for securities-related business under tough regulation are significantly lower than those of the firms unqualified for the business under light regulation. The H1 is preliminarily verified. Panel C also reveals that the comprehensive and allocation efficiencies, internal governance level and professional degree of the firms unqualified for securities-related business were greatly larger than those of the firms qualified for the

[19] All data involving the comparison of national accounting industry are taken from Chinese Institute of Certified Public Accountants. *Development report of Chinese certified public accountant industry.* Beijing: Chinese Financial and Economic Publishing House, 2016, 12: 24-107.

business before implementing the two regulation documents. It is possibly related to the strict regulation of the market access regulation document (No.6 in 2007) prior to the No.2 in 2012. Among the control variables of other organizational forms, the number of firms unqualified for securities-related business in partnership form is significantly lower than that qualified for the business, which conforms to the fact that partnership is in favor of the external expansion of the firms qualified for securities-related business. The proportions of being divisions and ranked top 50 in Guangdong firms as well as the business concentration of the firms qualified for securities-related business are greatly larger than those of the firms unqualified for the business. In terms of external environment factors, the economic development level of a region where the firms unqualified for securities-related business are situated in is remarkably higher than that of a region where the firms qualified for the business are located in, while the industry concentration and industry agglomeration of the former are significantly lower than those of the latter.

Panel D displays that the comprehensive and allocation efficiencies of the firms qualified for securities-related business are still significantly lower than those of the firms unqualified for the business after implementing the two regulation documents. However, the comprehensive and allocation efficiencies of the firms qualified for securities-related business both significantly improve (separately by 14.84% and 14.26%) while those of the firms unqualified for the business also remarkably rise (separately by 11.3% and 10.19%) without eliminating various factors such as time trend. Obviously, the firms qualified for securities-related business under tougher regulation get larger progress in efficiency. The relative scale of partners in the firms unqualified for securities-related business is significantly larger than that of the firms qualified for the business, which indicates that the internal governance of the former is greatly better than that of the latter. The proportion of the firms qualified for securities-related business based on partnership form is significantly larger than that of the firms unqualified for securities-related business. It is concerned with that the requirement of transforming the organizational form of the firms to special general partnership in No.2 document in 2012, which is a premise of applying for qualification for securities-related business. The firms qualified for securities-related business have more divisions than those unqualified for the business, which is related to the requirement for business scale of the firms qualified for securities-related business. Only expanding divisions can accelerate the development of these firms. The proportion of the firms qualified for securities-related business ranked top 50 is remarkably larger than that of the firms unqualified for the business, which is connected with the fact that only firms with large scale can apply for the qualification for securities-related business. Surprisingly, the CPA relative scale of the firms qualified for securities-related business is significantly lower than that of the firms unqualified for the business, same as that before implementing No.2 document in 2012, indicating the firms unqualified for the business show a higher professional level. It is possibly concerned with the fact that the No. 2 document in 2012 only stipulated CPA absolute scale but not the relative scale. Moreover, the business concentration of the firms qualified for securities-related business is slightly larger than that of the firms unqualified for the business. It implies that the firms qualified for securities-related business are not absolutely more diversified than the firms unqualified for the business and the audit business still shows a large proportion. In terms of external environment factors, the economic development level, industry concentration and industry agglomeration of the location of the firms qualified for securities-related business are larger than those of the location of the firms unqualified for the business.

Panel E reveals that the comprehensive and allocation efficiencies of the firms with high internal governance levels are significantly higher than those of those with low internal governance levels. Thus, the H2 is preliminarily verified. Panels F and G indicate that firms

qualified and unqualified for securities-related business with high internal governance levels both do not show great disparities in the comprehensive and allocation efficiencies. However, for accounting firms with low internal governance levels, those qualified for securities-related business present significantly lower comprehensive and allocation efficiencies than those unqualified for the business. This implies that the internal governance not only has a positive effect on the efficiency of firms but also can positively adjust the negative relationship between the government regulation and the efficiency of firms. It proves the H3 and further verifies the H2.

Panels H, I and J separately display the efficiencies of firms (headquarters and divisions) under different organizational forms and scales. As shown in the table, the efficiency under partnership system is greatly higher than that under limited liability system. The comprehensive efficiency of divisions is higher than that of headquarters while there is no significant difference. The allocation efficiency of divisions is remarkably lower than that of headquarters, which is closely concerned with multiple superiorities of headquarters such as political resources and talents[20]. Surprisingly, the efficiencies of the firms ranked top 50 (Big50) are significantly lower than those of the firms not included in the top 50, which implies that the firms with large scale probably acquire the scale benefits but not certainly the scale efficiency.

**Table 4.** Descriptive statistics

Panel A: Full sample descriptive statistics

| Variable | Obs | Mean | Std. Dev. | Min | Med | Max |
|---|---|---|---|---|---|---|
| Crste | 5125 | 0.692 | 0.175 | 0.412 | 0.659 | 1 |
| Scale | 5125 | 0.739 | 0.168 | 0.432 | 0.724 | 1 |
| QSB | 5125 | 0.093 | 0.291 | 0 | 0 | 1 |
| DUM_Partner | 5125 | 0.503 | 0.5 | 0 | 1 | 1 |
| Org_form | 5125 | 0.628 | 0.483 | 0 | 1 | 1 |
| Divisions | 5125 | 0.102 | 0.303 | 0 | 0 | 1 |
| Big50 | 5125 | 0.107 | 0.31 | 0 | 0 | 1 |
| CPA_g | 5125 | 0.35 | 0.161 | 0.091 | 0.329 | 0.917 |
| Busi_con | 5125 | 0.713 | 0.201 | 0.066 | 0.752 | 0.994 |
| GDPindex | 5125 | 111.409 | 3.137 | 105 | 110.65 | 132.92 |
| HHI | 5125 | 0.005 | 0.005 | 2.30E-07 | 0.007 | 0.014 |
| CYJJ | 5125 | 0.184 | 0.141 | 0.007 | 0.241 | 0.363 |
| POST | 5125 | 0.446 | 0.497 | 0 | 0 | 1 |

Panel B: Efficiency description of firms under different control levels

| Variable | QSB=1 | | | QSB=0 | | | QSB=1 VS QSB=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.661 | 0.593 | 0.196 | 0.695 | 0.664 | 0.172 | 4.036*** | 5.233*** |
| Scale | 0.678 | 0.613 | 0.197 | 0.746 | 0.729 | 0.163 | 8.437*** | 8.675*** |

[20] Among the 40 firms qualified for securities-related business newly declared in April 2017, the headquarters of 27 firms were located in Beijing, the capital city and political center of China, which took up 68%. Three firms set up their headquarters in Shanghai, the economic and financial center of China, and only one set up its headquarter in Guangdong province.

Panel C: Descriptive statistics of securities and non securities before the implementation of No. 2 document in 2012

| Variable | QSB=1 | | | QSB=0 | | | QSB=1 VS QSB=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.614 | 0.561 | 0.179 | 0.662 | 0.62 | 0.179 | 3.934*** | 4.649*** |
| Scale | 0.631 | 0.581 | 0.179 | 0.715 | 0.687 | 0.169 | 7.029*** | 7.63*** |
| DUM_Partner | 0.078 | 0 | 0.269 | 0.591 | 1 | 0.492 | 15.588*** | 14.963*** |
| Org_form | 0.665 | 1 | 0.473 | 0.602 | 1 | 0.49 | -1.894* | -1.893* |
| Divisions | 0.809 | 1 | 0.394 | 0.019 | 0 | 0.136 | -66.862*** | -41.663*** |
| Big50 | 0.661 | 1 | 0.474 | 0.057 | 0 | 0.231 | -33.83*** | -28.56*** |
| CPA_g | 0.331 | 0.324 | 0.183 | 0.38 | 0.343 | 0.178 | 3.926*** | 3.963*** |
| Busi_con | 0.773 | 0.854 | 0.213 | 0.667 | 0.697 | 0.198 | -7.72*** | -9.249*** |
| GDPindex | 112.58 | 112.17 | 2.145 | 113.157 | 112.5 | 3.182 | 2.693*** | 2.562** |
| HHI | 0.009 | 0.011 | 0.004 | 0.006 | 0.007 | 0.006 | -9.116*** | -8.518*** |
| CYJJ | 0.258 | 0.263 | 0.109 | 0.18 | 0.222 | 0.147 | -7.86*** | -6.543*** |

Panel D: Descriptive statistics of securities and non securities after the implementation of No. 2 document in 2012

| Variable | QSB=1 | | | QSB=0 | | | QSB=1 VS QSB=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.705 | 0.683 | 0.202 | 0.737 | 0.722 | 0.154 | 2.975*** | 3.028*** |
| Scale | 0.721 | 0.708 | 0.204 | 0.786 | 0.784 | 0.145 | 6.35*** | 5.066*** |
| DUM_Partner | 0.028 | 0 | 0.166 | 0.497 | 0 | 0.5 | 14.67*** | 14.028*** |
| Org_form | 0.96 | 1 | 0.197 | 0.617 | 1 | 0.486 | -10.988*** | -10.711*** |
| Divisions | 0.964 | 1 | 0.187 | 0.024 | 0 | 0.152 | -89.667*** | -42.191*** |
| Big50 | 0.702 | 1 | 0.459 | 0.037 | 0 | 0.19 | -42.221*** | -31.652*** |
| CPA_g | 0.275 | 0.259 | 0.122 | 0.324 | 0.31 | 0.128 | 5.7129*** | 6.253*** |
| Busi_con | 0.767 | 0.828 | 0.21 | 0.759 | 0.803 | 0.187 | -0.631 | -1.87* |
| GDPindex | 109.384 | 108.86 | 1.198 | 109.902 | 108.86 | 1.431 | -0.991 | -1.816* |
| HHI | 0.006 | 0.007 | 0.004 | 0.004 | 0.001 | 0.004 | -8.149*** | -8.525*** |
| CYJJ | 0.251 | 0.273 | 0.103 | 0.172 | 0.26 | 0.135 | -8.927*** | -7.822*** |

Panel E: Efficiency description of firms under different internal governance levels

| Variable | DUM_partner=1 | | | DUM_partner=0 | | | DUM_partner=1 VS DUM_partner=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.7 | 0.669 | 0.174 | 0.684 | 0.652 | 0.175 | -3.195*** | -3.182*** |
| Scale | 0.754 | 0.738 | 0.164 | 0.724 | 0.712 | 0.17 | -6.343*** | -6.204*** |

Panel F: Descriptive statistics of securities and non securities in high internal governance group

| Variable | QSB=1 | QSB=0 | QSB=1 VS QSB=0 |
|---|---|---|---|

| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
|---|---|---|---|---|---|---|---|---|
| Crste | 0.71 | 0.586 | 0.231 | 0.699 | 0.669 | 0.174 | -0.292 | 0.121 |
| Scale | 0.728 | 0.623 | 0.224 | 0.754 | 0.739 | 0.164 | 0.781 | 0.792 |

Panel G: Descriptive statistics of securities and non securities in low internal governance group

| Variable | QSB=1 | | | QSB=0 | | | QSB=1 VS QSB=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.658 | 0.593 | 0.194 | 0.689 | 0.66 | 0.17 | 3.429*** | 4.608*** |
| Scale | 0.675 | 0.612 | 0.195 | 0.735 | 0.723 | 0.165 | 6.852*** | 7.282*** |

Panel H: Efficiency statistics description of firms with different organizational forms

| Variable | Org_form=1 | | | Org_form=0 | | | Org_form=1 VS Org_form=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.739 | 0.718 | 0.164 | 0.612 | 0.557 | 0.164 | -26.859*** | -27.246*** |
| Scale | 0.788 | 0.784 | 0.154 | 0.657 | 0.608 | 0.158 | -29.03*** | -28.002*** |

Panel I: Efficiency statistics description of branch office and general office

| Variable | Divisions=1 | | | Divisions=0 | | | Divisions=1 VS Divisions=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.702 | 0.651 | 0.202 | 0.691 | 0.66 | 0.171 | -1.432 | -0.111 |
| Scale | 0.721 | 0.685 | 0.202 | 0.741 | 0.725 | 0.163 | 2.642*** | 3.173*** |

Panel J: Efficiency statistics description of 50 big and non 50 firms

| Variable | Big50=1 | | | Big50=0 | | | Big50=1 VS Big50=0 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Med | Std. Dev. | Mean | Med | Std. Dev. | t value | z value |
| Crste | 0.588 | 0.524 | 0.171 | 0.704 | 0.675 | 0.171 | 15.059*** | 16.39*** |
| Scale | 0.602 | 0.539 | 0.169 | 0.756 | 0.739 | 0.16 | 21.231*** | 20.675*** |

## 6.2. regression analysis

The second column in Table 5 shows the Tobit regression result of panel data of model (1) according to years and cities. The result reveals that QSB reflecting governance regulation is negatively correlated with the comprehensive efficiency of firms, implying that the comprehensive efficiency of the firms qualified for securities-related business is significantly lower than that of the firms unqualified for the business owing to tough regulation. It reveals that government regulation can cause the efficiency loss of firms. Therefore, H1 is verified. DUM_partner (describing internal governance) of firms has a significant positive correlation with the comprehensive efficiency of firms, which indicates that the larger the relative scales of partners in current Chinese accounting firms are, the more the benefit for the improvement

of comprehensive efficiency of firms. It also reveals that it exerts remarkable practical significance to take the relative scale but not the absolute scale of partners as the index for internal governance of firms. Therefore, H2 is verified.

The regression result of control variables of organizational forms shows that Org_form (reflecting organizational form of firms) is remarkably positively correlated with the comprehensive efficiency of firms. It indicates that the efficiency of partnership firms is higher than that of firms with limited liability system. The Divisions which indicates that a firm is a division exert a significant positive correlation with the comprehensive efficiency of firms, which implies that the comprehensive efficiency of divisions is greatly higher than that of headquarters. Under the strategic background of facilitating current Chinese accounting firms to become stronger and larger, it is certain that the comprehensive efficiency of the divisions is higher than that of the headquarters. There are two reasons. On the one hand, the headquarters are likely to provide plenty of resources support and large decision-making power for the divisions considering the "larger and stronger" strategic target and generally implement light regulation. Additionally, as works of firms are highly professional, only members of a project are aware of the risk of the project. However, the headquarters cannot judge the project risk owing to the spatio-temporal distance. Therefore, they cannot make specific regulation requests for business of the divisions. On the other hand, development is the first task for the divisions and no development is the largest risk. Therefore, under the given background of being stronger and larger and having fixed high-quality customer resources, strict internal control certainly affects the development rate and efficiency of divisions as well as the economic benefits of team members. Additionally, the current risk sharing system of firms defines that both headquarters and divisions take responsibilities if a partner behaves illegally, which determines that the divisions concentrate on the development efficiency but not the risk control. The scale of firms (Big50) has a significant negative correlation with the comprehensive efficiency of firms, which conforms to the current status and reality of the Chinese accounting industry: firstly, Big50 accounting firms are generally qualified for securities-related business[21]while these firms work under strict external regulation and supervision and rigorous self-disciplines. Therefore, it is possible for these firms to sacrifice the efficiency for guaranteeing the audit quality. Secondly, vicious competition frequently occurs in Chinese accounting industry formed by small, disperse and disordered accounting firms. Especially, large-scale firms are in inferiority in the business field of unlisted companies with larger market scale and government purchase field. CPA_g which denotes the specialization degree is significantly positively correlated with the comprehensive efficiency of firms, which is matched with the fact that CPAs are the core resource and asset of accounting firms. Busi_con representing business concentration has a significant negative correlation with the comprehensive efficiency of accounting firms, implying that the higher the proportion of the audit business of firms is, the lower the comprehensive efficiency. It provides a theoretical basis for encouraging accounting firms to develop new business and implement the diversification strategy.

The regression result of control variables of external environment factors indicates that GDPindex representing the economic development level of the location of accounting firms is positively correlated with the comprehensive efficiency of firms, which is consistent with the expectation. The reason why the correlation is insignificant is probably because western classic economics deems that only effective competition can promote social efficiency. On the contrary, ineffective and disordered competition does not certainly improve the social efficiency but probably cause the resource waste. Currently, Chinese accounting industry is in

[21] According to statistics, there were 47 firms qualified for securities-related business in China, 34 of which set up divisions in Guangdong province. There are 70 headquarters and divisions qualified for securities-related business including one headquarter and one division based in Guangdong province. For example, only 9 firms (headquarters and divisions) were unqualified for securities-related business in the top 50 firms in Guangdong province in 2016.

disordered and vicious competition, which results in that firms cannot fully share the advantages brought by the local economic development. The possibility[22] is verified by conducting the regression test by dividing cities into groups according to competitive degrees. The higher the industry concentration is, the lower the competitive degree. The HHI exerts a positive correlation with the comprehensive efficiency of firms. It indicates that accounting firms need to grow larger and stronger to improve industry concentration and reduce disordered competition, so as to avoid damage to the development environment of firms and decrease efficiency loss and reduction of audit service quality due to disordered and vicious competitions. Industry agglomeration is favorable for flows of various elements such as talents and funds in industries to improve the allocation efficiency of elements and resources. CYJJ has a significant positive correlation with the comprehensive efficiency of accounting firms, which is accordance with the expectation.

The third column of Table 5 shows the Tobit regression result of panel data of model (2) according to years and cities. The result indicates that the coefficient of QSB is significantly negative, implying that the government regulation has a significant negative correlation with the comprehensive efficiency of firms. The coefficient of DUM_partner is significantly positive, which indicates that the internal governance exerts a significant positive correlation with the comprehensive efficiency of firms. The interaction item (QSBxDUM_partner) paid great concern between the government regulation and internal governance is also significantly positive, indicating that internal governance positively adjusts the efficiency loss caused by government regulation. The relationships and significance levels between other variables and the efficiency of firms are accordant with the results of model (1). As shown in the regression coefficient of the third column in Table 5, the quadrant A in Figure 2 shows the highest efficiency, which means that the firms with a high internal governance level under light government regulation show the highest efficiency level. The efficiency of Quadrant D is at the second place, which implies that the firms with a low internal governance level under light government regulation take the second place in terms of their efficiency. Quadrant B has the third efficiency level, indicating that the firms with a high internal governance level under rigorous government regulation are ranked the third in efficiency. Quadrant C shows the lowest efficiency level, which indicates that the efficiency of the firms with a high internal governance level under tough government regulation is at the lowest level. It indicates that relaxing the government regulation is favorable for improvement of the efficiency of firms (A>B and D>C) however the internal governance is. It also implies that a good internal governance is greatly beneficial for improving the efficiency of firms (B>C and A>D) however the government regulation is. In the context that government constantly strengthens regulations and supervisions, the better the internal governance of firms is, the easier the efficiency loss that caused by external regulation is reduced. Therefore, the internal governance of firms not only can positively promote the efficiency of firms but also can positively adjust the efficiency loss of firms caused by external regulations. Thus, H3 is verified, and H1 and H2 are also further proved.

[22] According to the field investigation about the project *Analysis on Incomes in Guangdong Accounting Industry in 2001~2015*, nine cities (Guangzhou, Shenzhen, Huizhou, Zhuhai, Foshan, Dongguan, Jiangmen, Zhongshan and Zhaoqing) in Guangdong province in Perarl River Delta with the most developed economy and the most intensive competitiveness were regarded as the intensive competitive group. The other twelve cities were considered as the common competitive group. On this basis, the group-based regression was conducted. It can be found that the regression coefficient of GDPindex of the intensive competitive group was -.0102, showing significance at 1% level. By contrast, the regression coefficient of GDPindex of the common competitive group was .0041, showing an insignificant level. Limited by the length, the regression result is not displayed, while can be obtained from the authors if needed.

**Table 5.** Panel Tobit regression results

| VARIABLES | Model （1） | Model （2） |
|---|---|---|
| | Crste | Crste |
| QSB | -0.105*** | -0.119*** |
| | (0.0266) | (0.0274) |
| DUM_partner | 0.0264*** | 0.0251*** |
| | (0.00562) | (0.00565) |
| QSBxDUM_partner | | 0.0749** |
| | | (0.0344) |
| Org_form | 0.130*** | 0.131*** |
| | (0.0112) | (0.0112) |
| Divisions | 0.123*** | 0.131*** |
| | (0.0258) | (0.0259) |
| Big50 | -0.0627*** | -0.0611*** |
| | (0.0105) | (0.0106) |
| CPA_g | 0.0805*** | 0.0791*** |
| | (0.0159) | (0.0159) |
| Busi_con | -0.0716*** | -0.0705*** |
| | (0.0115) | (0.0115) |
| GDPindex | 0.00173 | 0.00172 |
| | (0.00107) | (0.00107) |
| HHI | 0.900 | 0.926 |
| | (1.380) | (1.380) |
| CYJJ | 0.853*** | 0.856*** |
| | (0.150) | (0.150) |
| Constant | 0.421*** | 0.421*** |
| | (0.133) | (0.133) |
| sigma_u | 0.114*** | 0.114*** |
| | (0.00390) | (0.00389) |
| sigma_e | 0.116*** | 0.116*** |
| | (0.00130) | (0.00130) |
| Observations | 5,125 | 5,125 |
| Number of id | 712 | 712 |
| Year | Control | |
| City | Control | |
| rho | 0.491 (0.018) | 0.490 (0.018) |
| Wald chi2(40) | 1471.71 | 1478.10 |
| Log likelihood | 2403.6386 | 2406.0225 |
| Prob > chi2 | 0.0000 | 0.0000 |
| LR test | chibar2(01)= 1615.38<br>Prob>=chibar2 = 0.000 | chibar2(01)= 1607.35<br>Prob>=chibar2 = 0.000 |

Standard errors in parentheses，*** p<0.01, ** p<0.05, * p<0.1

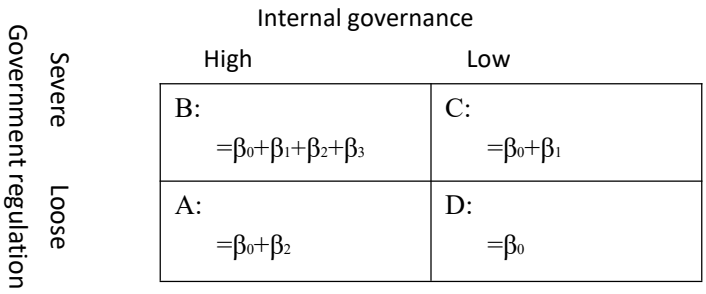


**Figure 2.** The influence of interaction between government regulation and internal governance on firm efficiency

## 6.3. Robustness test

The study tested the robustness of the model (1). Firstly, the explained variable–comprehensive efficiency (Crste) was replaced with allocation efficiency (Scale). Similarly, Tobit panel regression was conducted according to years and cities and the regressive result is shown in the second column in Table 6, which is totally agreement with that in columns 2~4 in Table 5. Secondly, the division samples whose headquarters are not established in Guangdong province are eliminated. According to statistics, among 40 national large-scale firms qualified for securities-related business, 34 ones establish divisions in Guangdong province. The divisions rely on the brand and powerful resource supports of headquarters. Compared with headquarters and divisions of local firms, the divisions of national firms show better internal governance and control. To avoid these divisions affect the research result, the division samples of national large-scale firms are eliminated and the regressive result of other firms in Guangdong province is displayed in the third column in Table 6. As shown in the third column, the relationship of QSB (external regulation) and DUM_Partner (internal governance) with comprehensive efficiency of firms and their significance levels keep unchanged as well as that of various control variables with the comprehensive efficiency of firms and their significance levels. It indicates that the design of model (1) and the regressive result are robust and therefore hypotheses H1 and H2 are verified.

A test for checking the robustness of model (2) was carried out. As displayed in the fourth column in Table 6, the explained variable–comprehensive efficiency (Crste) is substituted for allocation efficiency (Scale). Then it is found that the relationship of QSB (external regulation) and DUM_Partner (internal governance) with the allocation efficiency (Scale) of firms and their significance levels maintain unchanged as well as that between diverse variables and the comprehensive efficiency of firms and their significance levels. It implies that the setting of the model (2) and the regressive result are robust, thus proving the hypothesis H3. Thirdly, it is considered that the statement data of small and micro-firms probably show a low quality, so firms ranked the last 10% according to the business incomes are excluded, based on which the empirical result is consistent with that of the total samples. Finally, the output-oriented VRS BCC model is replaced with the input-oriented BCC model with constant returns to scale (CRS) (Banker et al., 1984). The efficiencies (comprehensive efficiency, productivity and allocation efficiency) of firms under CRS (input minimization under given scale) are re-measured by using Deap.2.1 software. The estimated comprehensive and allocation efficiencies are regarded as the explained variable of Tobit panel regression in the second stage and it is found that the regressive result is totally agreed with the analytic result obtained using the output-oriented VRS model.

## 6.4. Endogeneity

For the two primarily investigated variables, the substitutive variable of government regulation (being qualified for securities-related business (QSB)), as a typical exogenous regulation variable, is the qualification of market access permission. It is examined and approved by the Ministry of Finance and CSRC which strictly control the quantity of these firms (namely, the quantity does not increase for firms satisfying the corresponding application conditions). The substitutive variable of internal governance (scale of partners (DUM_Partner)) probably shows a certain endogeneity. However, the relative but not the absolute scale is applied, so the endogeneity that the absolute scale of partners enlarges with the efficiency improvement and development of firms is reduced to some extent. Therefore, the endogenous problem or significant endogeneity does not appear in the study.

**Table 6.** robustness check

| VARIABLES | Model （1） | | Model （2） |
|---|---|---|---|
| | Full Sample | Sample within Guangdong Province | Full Sample |
| | Scale | Crste | Scale |
| QSB | -0.116*** | -0.0699** | -0.128*** |
| | (0.0253) | (0.0332) | (0.0260) |
| DUM_partner | 0.0339*** | 0.0293*** | 0.0327*** |
| | (0.00531) | (0.00556) | (0.00534) |
| QSBxDUM_partner | | | 0.0638** |
| | | | (0.0324) |
| Org_form | 0.136*** | 0.150*** | 0.137*** |
| | (0.0107) | (0.0117) | (0.0107) |
| Divisions | 0.111*** | 0.140*** | 0.118*** |
| | (0.0245) | (0.0386) | (0.0247) |
| Big50 | -0.0838*** | -0.0235* | -0.0824*** |
| | (0.00994) | (0.0122) | (0.00996) |
| CPA_g | 0.0592*** | 0.0707*** | 0.0581*** |
| | (0.0150) | (0.0161) | (0.0150) |
| Busi_con | -0.0721*** | -0.0700*** | -0.0711*** |
| | (0.0109) | (0.0119) | (0.0109) |
| GDPindex | 0.00166 | 0.00150 | 0.00165 |
| | (0.00101) | (0.00105) | (0.00101) |
| HHI | -0.138 | 1.137 | -0.115 |
| | (1.309) | (1.423) | (1.309) |
| CYJJ | 0.662*** | 0.909*** | 0.665*** |
| | (0.142) | (0.155) | (0.142) |
| Constant | 0.468*** | 0.425*** | 0.468*** |
| | (0.126) | (0.131) | (0.126) |
| sigma_u | 0.109*** | 0.110*** | 0.109*** |
| | (0.00374) | (0.00399) | (0.00374) |
| sigma_e | 0.109*** | 0.114*** | 0.109*** |
| | (0.00125) | (0.00133) | (0.00125) |

| | | | |
|---|---|---|---|
| Year | | Control | |
| City | | Control | |
| Observations | 5,125 | 4,677 | 5,125 |
| Number of id | 712 | 630 | 712 |
| rho | 0.5017 (0.018364) | 0.4837 (0.019362) | 0.5005 (0.0183746) |
| Wald chi2(40) | 1690.96 | 1398.27 | 1696.58 |
| Log likelihood | 2461.7688 | 2300.1138 | 2463.71 |
| Prob > chi2 | 0.0000 | 0.0000 | 0.0000 |
| LR test | chibar2(01)= 1644.40<br>Prob>=chibar2 = 0.000 | chibar2(01)= 1456.97<br>Prob>=chibar2 = 0.000 | chibar2(01)= 1636.66<br>Prob>=chibar2 = 0.000 |

Standard errors in parentheses， *** p<0.01, ** p<0.05, * p<0.1

## 6.5. additional analysis

Chinese government has implemented a rigorous market access regulation, namely, No. 2 document in 2012 on the securities- and futures-related markets since 2012. The government implemented price regulation in the whole industry by enforcing N0.313 document in 2011, which exerted significant effects on accounting firms especially the firms qualified for securities-related business. To evaluate the influence of the two regulation measures on the efficiencies of firms, the time trend variable POST was established by taking the year of 2012 as the boundary point. The POST values 0 for samples before implementing the two regulation documents (before 2012) while it values 1 for samples afterwards (after and in 2012). The DID model (3) was established to test the influence of the exogenous event (implementing the two regulation documents) on the efficiencies of firms under different supervision pressures. DID model (3) is displayed as follows:

$$\mathrm{Crste} = \gamma_0 + \gamma_1 \mathrm{QSB} + \gamma_2 POST + \gamma_3 \mathrm{QSB} \times POST + \gamma_4 \mathrm{DUM\_partner} + \sum \mathrm{contr\_vars} + \sum city + \varepsilon \quad (3)$$

As shown in the second column in Table 7, γ0 values 0.691 (significantly positive). It represents the efficiency level of firms qualified for securities-related business before implementing the two regulation documents, and it is larger than the efficiency level (0.662) of the firms unqualified for securities-related business before the event. Moreover, γ1 values -0.108 (significantly negative), which reveals that the efficiencies of firms qualified for securities-related business are significantly lower than those of firms unqualified for securities-related business before the implementation of the two regulation documents. The result conforms to the conclusions of models (1) and (2). And also, γ2 values 0.0586 (significantly positive), reflecting that the efficiencies of firms unqualified for securities-related business significantly improve after the implementation of the two regulation documents. The greatly concerned efficiency difference γ3 of firms qualified for securities-related business before and after implementing the two regulation documents is equal to -0.0249 (significantly negative). This reveals that the efficiencies of firms qualified for securities-related business greatly reduce after the implementation of the two regulation documents. On this basis, it can be seen that implementing the two regulation documents means to strengthen government regulation, which significantly affects the efficiency of the firms qualified for securities-related business under tough supervision. And also, it indicates that strengthening the government regulation exerts a significant negative influence on the efficiencies of firms. The third column in Table 7 shows the robustness test of model (3). The test result shows that the relationship between the investigated variables and the allocation efficiency of firms and their significant levels do not change, thereby further verifying the H1.

**Table 7.** Regression results of Model (3)

| VARIABLES | Crste | | Scale |
|---|---|---|---|
| QSB | -0.108*** | | -0.118*** |
| | (0.0275) | | (0.0262) |
| POST | 0.0586*** | | 0.0541*** |
| | (0.00548) | | (0.00523) |
| QSBXPOST | -0.0249* | | -0.0260** |
| | (0.0138) | | (0.0131) |
| DUM_partner | 0.0262*** | | 0.0342*** |
| | (0.00591) | | (0.00563) |
| Org_form | 0.134*** | | 0.140*** |
| | (0.0114) | | (0.0109) |
| Divisions | 0.131*** | | 0.119*** |
| | (0.0262) | | (0.0250) |
| Big50 | -0.0511*** | | -0.0717*** |
| | (0.0110) | | (0.0105) |
| CPA_g | 0.0464*** | | 0.0285* |
| | (0.0162) | | (0.0155) |
| Busi_con | -0.0688*** | | -0.0699*** |
| | (0.0121) | | (0.0115) |
| GDPindex | -0.000785 | | -0.00159** |
| | (0.000780) | | (0.000745) |
| HHI | -13.55*** | | -14.13*** |
| | (1.248) | | (1.193) |
| CYJJ | 0.444*** | | 0.285* |
| | (0.156) | | (0.148) |
| Constant | 0.691*** | | 0.825*** |
| | (0.101) | | (0.0963) |
| sigma_u | 0.114*** | | 0.109*** |
| | (0.00399) | | (0.00383) |
| sigma_e | 0.123*** | | 0.116*** |
| | (0.00138) | | (0.00133) |
| Year | | Control | |
| City | | Control | |
| Observations | 5,125 | | 5,125 |
| Number of id | 712 | | 712 |
| rho | 0.4617 (0.0187) | | 0.4671 (0.0187) |
| Wald chi2(40) | 891.33 | | 1040.84 |
| Log likelihood | 2162.0224 | | 2196.2571 |
| Prob > chi2 | 0.0000 | | 0.0000 |
| LR test | chibar2(01)= 1418.05<br>Prob>=chibar2 = 0.000 | | chibar2(01)= 1424.91<br>Prob>=chibar2 = 0.000 |

Standard errors in parentheses，*** p<0.01, ** p<0.05, * p<0.1

## 7. Conclusions and suggestions

Based on the microscopic financial data of accounting firms (2006~2016) of Guangdong province, the effects of government regulations and internal governance on the efficiency of accounting firms are studied using DEA-Tobit two-stage analysis framework and DID method. The following research results are attained: firstly, the government regulation is significantly negatively correlated with the efficiencies of firms. The firms qualified for securities-related business under tough government regulation are more greatly affected by the implementation of regulation measures and present more significant efficiency loss compared with the firms unqualified for securities-related business. Secondly, the internal governance of firms exerts a significant positive incentive effect on the efficiencies of firms. Being a partner of an accounting firm is the final career target of a CPA, so properly expanding the relative scale of partners can promotes partners and CPAs to play their role in autonomous governance and therefore further improve the comprehensive and resource allocation efficiencies of firms. Thirdly, internal governance of firms can positively adjust the efficiency loss caused by government regulations. Researches also reveal that the partnership

system is more favorable for improving the comprehensive and resource allocation efficiencies compared with the limited liability system. The scale of firms has a significant negative correlation with the comprehensive and allocation efficiencies of firms. The firms with high business concentration and excessively relying on audit services show relatively low comprehensive and resource allocation efficiencies. The higher the specialization degree is, the higher the comprehensive and allocation efficiencies of firms.

The research result implies that government regulations on the securities- and futures-related market access, the institutional norms of strengthening internal governance and the institutional arrangement and supervision policies have different effects. Here, the institutional arrangement and supervision policies include forcing firms qualified for securities-related business to use special general partnership. The government regulation on securities- and futures-related market access does not reach to the expected target of being larger and stronger and of improving the audit quality of capital market. The former is shown as low overall efficiency, significantly lower efficiencies of large-scale firms than those of small-scale firms, and significantly lower efficiencies of firms qualified for securities-related business than those of firms unqualified for the business. Since the next half year of 2016, multiple large-scale firms qualified for securities-related business ranked high (such as Reanda Certified Public Accountants, Ruihua Certified Public Accountants and BDO China Sun Lun Pan CPA Management Co., Ltd.[23]) were successively penalized by the Ministry of Finance and CSRC to suspend for half a year before starting new securities-related business due to various reasons. They include the unconscientious audit of yearly financial statements of listed companies and false content in issued audit reports. The penalty caused that numerous A-share listed companies in Chinese stock market, listed enterprises in National Equities Exchange and Quotations (NEEQ) and enterprises queued up for initial public offering (IPO) successively exchanged audit organizations. Therefore, the event brought huge economic and fame losses to accounting firms and great negative influences on the whole accounting industry.

Therefore, the following points are put forward in view of efficiency. Firstly, strengthening government regulation is probably not the optimal choice because it cannot improve the audit efficiency nor the audit quality. However, current Chinese accounting industry shows the following significant characteristics: small, disperse and chaotic accounting firms, disordered competition and low-price competition. Under such condition, replacing the market access regulation with strengthening specifications and supervisions for behavior subjects including firms and CPAs is probably a better choice. Strengthening the process supervision of behavior subjects to guide firms to improve internal governance, quality control system and risk prevention mechanism and improve professional quality examination and penalty mechanism of CPAs probably contributes more to improve the corporate efficiency and audit quality. Secondly, the government regulation should not be regarded as a target but need to promote constructions and improve the internal governance and control system of firms. Only when the supervision mode of audit market transfers to internal governance constraint-driven from external regulation-driven, can further reduce the efficiency loss caused by government regulation and external supervision. Thirdly, based on the autonomous governance motive of partners and goal incentive of CPAs, properly expanding the relative scale of partners and improving the internal governance mechanism centered on the board of shareholders (partnership meeting) can effectively promote the efficiencies of firms. Fourthly, promoting the transformation of firms to partnership system

[23] The *Top 100 Accounting Firms in the Comprehensive Assessment in 2016* issued by Chinese Institute of Certified Public Accountants on 21 January 2017 revealed that Reanda Certified Public Accountants, Ruihua Certified Public Accountants and BDO China Sun Lun Pan CPA Management Co., Ltd. ranked 21, 2 and 4, respectively. [OL]http://www.cicpa.org.cn/news/201701/t20170112_49462.html

not only conforms to the efficiency requirement but also agrees with the universal international practice. Fifthly, accelerating the aggregation of CPA core resources, playing the talent aggregation effect and improving the specialization degree of firms are in favor of improving the efficiencies of firms. Sixthly, the efficiency potential of firms favorably can be develop by rapidly developing new businesses and reducing the audit business concentration. Finally, discussing the efficiencies of firms has extremely important economic and practical significance for the accounting industry characterized by high specialization degree. According to the logistic framework (structure-behavior-performance) of industrial organization theory, the efficiency directly affects the industrial structure of firms, further influences the subject behaviors and finally affects the audit service quality of accounting industry. Therefore, the efficiencies of firms eventually affect the audit quality concerned by the public through certain methods and paths. Considering this, the study puts forward a new problem for future researches: what is the relationship between the efficiencies of firms (comprehensive and allocation efficiencies) and audit service quality? Different explanations can be obtained from different perspectives, which is the further research direction.

## Reference


[1] Allen F, Qian J, Qian M. （2005）. Law, finance, and economic growth in China. Journal of Financial Economics , 77(1), 57-116.

[2] Appuhami R, Bhuyan M. （2015）. Examining the influence of corporate governance on intellectual capital efficiency. Managerial Auditing Journal , 30(4/5), 347-372.

[3] Badertscher B, Jorgensen B, Katz S, Kinney W.（2014）. Public Equity and Audit Pricing in the United States. Journal of Accounting Research , 52(2), 303-339.

[4] Banker R D, Chang H, Natarajan R.（2005）. Productivity Change, Technical Progress, and Relative Efficiency Change in the Public Accounting Industry. Management Science, 51(2), 291-304.

[5] Banker R D, Charnes A, Cooper W W. （1984）. some models for estimating technical and scale inefficiencies in data envelopment analysis. Management Science, 30(9), 1078-1092.

[6] Bates T W. （2005）. Asset Sales, Investment Opportunities, and the Use of Proceeds. Journal of Finance, 60(1), 105-135.

[7] Bertrand M, Mullainathan S. （2003）. Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. Journal of Political Economy, 111(5), 1043-1075.

[8] Billett M T, Garfinkel J A, Jiang Y.（2011）. The influence of governance on investment: Evidence from a hazard model. Journal of Financial Economics, 102(3), 643-670.

[9] Bodde D, Morris C. （1973）. Law in Imperial China. Law in Imperial China. University of Pennsylvania Press.

[10] Cheffins B R.（2001）. Does Law Matter?: The Separation Of Ownership And Control In The United Kingdom. Journal of Legal Studies , 30(72), 459-84.

[11] Chen D H, Fan J P H, Wong T J. （2002）. Do politicians jeopardize professionalism? Decentralization and the structure of chinese corporate boards. Shanghai University of Finance and Economics, Working Paper.

[12] Chen D H, Zhang T S, Li X. （2008）. Law Environment, Government Regulation and Implicit Contract: Empirical Evidence from the Scandals of Chinese Listed Companies. Economic Research Journal, 3, 60-72.

[13] Cheng M, Dan D, Zhang Y. （2013）. Does investment efficiency improve after the disclosure of material weaknesses in internal control over financial reporting?. Journal of Accounting & Economics, 56(1), 1-18.

[14] China Association of Certified Public Accountants. （2016）. Report on the development of CPA industry in China (2015). Beijing: China finance and economy press, 24-107.

[15] Coase R H.（1988）. The Firm, the Market, and the Law. Chicago: University of Chicago Press.

[16] Costinot A. （2009）. On the origins of comparative advantage. Journal of International Economics , 77(2), 255-264.

[17] DeFond M L, Francis J R. （2005）. Audit Research after Sarbanes-Oxley. Auditing A Journal of Practice & Theory, 24(1), 5-30.

[18] Dittmar A, Mahrt-Smith J.（2007）. Corporate governance and the value of cash holdings. Journal of Financial Economics, 83(3), 599-634.

[19] Eshleman J D, Lawson B. （2017）. Audit Market Structure and Audit Pricing. Social Science Electronic Publishing. Accounting Horizons, 31(1), 57-81.

[20] Fama E F, Jensen M C. （1983）. Separation of ownership and control. Journal of Law & Economics , 26(2), 301-325.

[21] Fang H X, Jin Y N. （2013）. Corporate Governance， Internal Control and Inefficient Investment: Theoretical Analysis and Empirical Evidences. Accounting Research, 7, 63-69.

[22] Frankel R M, Johnson M F, Nelson K K. （2002）. The Relation between Auditors' Fees for Nonaudit Services and Earnings Management. Accounting Review , 77(1), 71-105.

[23] Giroud X, Mueller H M. （2007）. Does Corporate Governance Matter in Competitive Industries?. Journal of Financial Economics , 95(3), 312-331.

[24] Glaeser E L, Shleifer A.（2001）. A Reason for Quantity Regulation. American Economic Review , 91(2), 431-435.

[25] Greenwood R, Hinings C R, Brown J. （1990）. “P2-Form” Strategic Management: Corporate Practices in Professional Partnerships. The Academy of Management Journal, 33(4), 725-755.

[26] Greenwood R, Li S X, Prakash R, Deephouse D L.（2005）. Reputation, Diversification, and Organizational Explanations of Performance in Professional Service Firms. Organization Science, 16(6), 661-673.

[27] Guner N, Ventura G, Xu Y. （2008）. Macroeconomic implications of size-dependent policies. Review of Economic Dynamics, 11(4), 721-744.

[28] Hermalin B E, Weisbach M S. （1988）. The Determinants of Board Composition. Rand

Journal of Economics, 19(4), 589-606.

[29] Hsieh C T, Klenow P J. （2009）. Misallocation and Manufacturing TFP in China and India. Quarterly Journal of Economics, 124(4), 1403-1448.

[30] Huang T C, Chang H, Chiou J R. （2016）. Audit Market Concentration, Audit Fees, and Audit Quality: Evidence from China. Auditing A Journal of Practice & Theory, 35(2), 121-145.

[31] Johnson S, Boone P, Breach A, Friedman E. （2000）. Corporate governance in the Asian financial crisis. Journal of Financial Economics, 58(1/2), 141-186.

[32] La Porta, Rafael, Shleifer, Andrei. （1999）. Corporate Ownership Around the World. The Journal of Finance, 54(2), 471-517.

[33] Lennox C, Pittman J. （2010）. Auditing the auditors: Evidence on the recent reforms to the external monitoring of audit firms. Journal of Accounting & Economics, 49(1), 84-103.

[34] Li W A, Jiang T. （2007）. On Corporate Governance and Over-investment of Listed Companies in China. Finance & Trade Economics, 12, 56-61.

[35] Li Y H, Li Z, Tang S L. （2011）. Corporate Life-cycle, Corporate Governance and Corporate Capital Allocation Effciency. Nankai Business Review, 14(3), 110-121.

[36] Lin C, Lin P, Song F. （2010）. Property rights protection and corporate R&D: Evidence from China. Journal of Development Economics, 93(1), 49-62.

[37] Liu F, Lin B. (2000). Accounting firm decoupling and government choice: an explanation. Accounting Research, 2, 9-15.

[38] Lu T P, Zhang D X. （2014）. The Influencing Factors Research on Accounting Firms's Operational Efficiency--Based on DEA-Tobit analysis framework. Auditing Research, 1, 88-95.

[39] Lynall M D, Golden B R, Hillman AJ. （2003）. Board Composition from Adolescence to Maturity: A Multitheoretic View. Academy of Management Review, 28(3), 416-431.

[40] Miller S M, Upadhyay M P. (2000). The effects of openness, trade orientation, and human capital on total factor productivity. Journal of Development Economics, 63(2):399-423.

[41] Nelson M W. （2006）. Response: Ameliorating Conflicts of Interest in Auditing: Effects of Recent Reforms on Auditors and Their Clients. Academy of Management Review, 31(1), 30-42.

[42] North D C, Hang X. （2014）. Institution, institutional change and economic performance. Shanghai: Shanghai people's Publishing House, 55-64.

[43] Palmrose Z V. （2006）. Maintaining the Value and Viability of Independent Auditors as Gatekeepers Under SOX: An Auditing Master Proposal. University of Southern California, Working Paper.

[44] Pistor K, Xu C. （2005）. Governing Stock Markets in Transition Economies: Lessons

from China. American Law & Economics Review, 7(1), 184-210.

[45] Pistor K. （2005）. Governing Emerging Stock Markets: legal vs administrative governance. Corporate Governance An International Review 13(1), 5-10.

[46] Restuccia D, Rogerson R.（2013）. Misallocation and productivity. Review of Economic Dynamics, 16(1), 1-10.

[47] Richardson S.（2006）. Over-investment of free cash flow. Review of Accounting Studies, 11(2-3), 159-189.

[48] Rosenstein S, Wyatt J G.（1997）. Inside Directors, Board Effectiveness, and Shareholder Wealth. Journal of Financial Economics, 44(2), 229-250.

[49] Stigler G J.（1971）. The Theory of Economic Regulation. Bell Journal of Economics & Management Science, 2(1), 3-21.

[50] Viscusi W K, Harrington J E, Vernon J M. （2005）. Economics of Regulation and Antitrust, 4th Edition[M]. Mit Press, Cambridge, Mass, 1(1), 45-77.

[51] Wang Q, Wong T J, Xia L.（2008）. State ownership, the institutional environment, and auditor choice: Evidence from China. Journal of Accounting & Economics, 46(1), 112-134.

[52] Wang Y M, Chen L.（2012）. An empirical study on the long term change of China's accounting firm productivity and its driving factors. Accounting Research, 1, 51-57.

[53] Wang Ya1, Hong Weiqing2,3, Liu Feng1,4, Xu Yao.（2016）. Supervision Game on Regulation Spillover Effect: A Case Study of THTF's Acquisition of EBEN. Nankai Business Review, 19(5), 4-15.

[54] Wu X, Chen M.（2012）. Internal Governance of Public Accounting Firms: Theory, Principles,and Implications for Organizational Strategies. Auditing Research, 3, 76-82.

[55] Wu X.（2001）. The concentration degree of China's Securities Audit Market and the independence of Certified Public Accountants. Chinese Certified Public Accountaht, 9, 14-16.

[56] Xie D R.（2001）. International Comparison of regulation modes of Certified Public Accountants. Auditing Research, 4, 36-42.

[57] Xie D R.（2002）. The regulation model of CPA Industry: a theoretical analysis. Accounting Research, 2, 12-20.

[58] Xu H Y, Tang G L, Wang X D.（2008）. DEA about the Operation Efficiency of the Accounting Firms in China. Accounting Research, 3, 74-81.

[59] Yang X Q, Zhang Z N, Wu H M.（2010）. Governance Environment, Excess Cash-holdings and Overinvestment--based on the Analysis of the Panel Data of Chinese Listed Companies. Nankai Business Review, 13, 61-69.

[60] Yi Z.（2002）. Incentives and performance of institutional change in industry -- An Empirical Study of CPA industry in China. Doctoral Dissertation of Ji Nan University.

[61] Yu H H, Xu L B, Chen B Z.（2010）. The Control Right of Ultimate Controlling

Shareholder and Overinvestment of Free Cash Flow. Economic Research Journal, 8,103-114.

[62] Yu L S, Wang Y Y, （2010）. Can Government's Regulation Improve the Performance of the Audit Markets? Management World, 8, 7-20.

[63] Zhang H L, Lu Z F. （2012）. The Cash Distribution, the Corporate Governance, and the Over-investment: an Investigation Based on the State of the Cash Holdings of China’ s Listed Companies and their Subsidiaries. Management World, 3,141-150.

[64] Zhang L M, Tang S H. （2008）. The Property-Right-Functions of CPA Auditing: Evolution and Extension, 8, 3-10.

[65] Zhang Q F. （2005）. Does government regulation improve the reputation of accounting firms? -- Empirical Evidence from China's securities market. Management World, 12, 14-23.

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