Artificial Intelligence and Accounting Profession Restructuring: Empirical Evidence from China's Top 100 Accounting Firms

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Abstract. While artificial intelligence (AI) enhances accounting efficiency, it simultaneously exerts substitution pressure on traditional accounting roles. As intelligent technologies deepen their penetration into the accounting domain, the risk of automation replacing basic accounting positions rises significantly. To investigate AI's restructuring effects on the accounting profession, this study analyzes empirical data from China's top 100 accounting firms (2020-2023). The findings reveal that AI adoption intensifies role transition pressures for accounting professionals. However, firm size and operational complexity mitigate technological substitution, while highly specialized accountants demonstrate greater adaptability in functional transitions. By elucidating AI's impact mechanisms, this research provides empirical insights for skill upgrading and career development pathways in the accounting profession.

Keywords: artificial intelligence, accounting profession restructuring, technological substitution, employment impact, skill transition

1   Introduction

The accelerated evolution of AI is reshaping global occupational dynamics, with the accounting industry—a core pillar of corporate value management—undergoing systemic restructuring in functional roles and talent demands. The *Digital Darwinism* report by ACCA and IMA highlights that mobile technology, blockchain, AI, cloud computing, digital payments, and virtual/augmented reality will profoundly transform management accounting practices [1]. Advanced AI technologies, such as deep learning, natural language processing, and automated process control, have transcended traditional accounting tools by enabling high-efficiency, high-precision data analysis. These innovations permeate the entire workflow, from transaction recording and financial reporting to risk forecasting. This technological shift not only compels accountants to transition from "transaction oversight" to "strategic value creation" but also demands that professionals transcend conventional skill boundaries to achieve competency leaps in technological adaptability, cross-domain collaboration, and business acumen.

This study innovatively quantifies AI's restructuring effects on accounting professionals by constructing metrics such as "AI substitution intensity" and "accountant transition efficacy." Using panel data models, we analyze dynamic operational data

from China's top 100 accounting firms (2020－2023). The results provide actionable recommendations for redefining competencies and career trajectories in China's accounting sector.

2   Literature Review

2.1   AI Applications in Accounting

The maturation of AI has led to its extensive adoption in finance, automating routine accounting tasks with increasing efficiency. Tian et al. validated AI's superiority in reducing human error rates through image processing for document recognition[2]. Yi et al. reviewed machine learning applications in financial forecasting and risk management, emphasizing AI's potential to augment human capabilities through automated analysis, albeit requiring interdisciplinary integration [3]. Qiu proposed that AI-driven accounting systems enhance information processing efficiency but depend on optimized human-machine collaboration [4].

2.2   AI's Substitution Effects on Accounting Roles

Scholars widely acknowledge AI's disruptive impact on basic accounting tasks, though its penetration into higher-order functions remains constrained by technical and institutional barriers. Prior et al. explored AI's potential in strategic client management, arguing that while AI optimizes decision-making, human interaction remains irreplaceable[5]. Zhang et al. identified strategic alignment, data quality, and employee skills as critical drivers of AI adoption in management accounting, alongside challenges such as data security and accountabil-ity[6]. Varzaru's structural equation modeling, based on Romanian management accountants, demonstrated that AI's usability and utility significantly influence professional acceptance[7]. Lehner et al. emphasized ethical concerns －such as transparency deficits, responsibility fragmentation, and trust erosion－ caused by AI-driven decisions, advocating for audit process redesigns to address AI autonomy[8]. Zhang et al. further differentiated ethical impacts across stakeholders, including data misuse risks and occupational isolation among accountants [9]. Gourlet et al. called for participatory research to contextualize AI ethics, balancing technological advancement with humanistic values [10].

In summary, while AI enhances decision-making efficiency and process innovation in accounting, it cannot fully replace human expertise in high-level analysis, professional judgment, and ethical decision-making. Accounting professionals must therefore pursue continuous skill development and role reconfiguration to harmonize technological empowerment with human capital.

3   Research Design

3.1   Baseline Model

To examine AI's substitution effects on accounting roles, we construct the following model:

$$APT_{i,t}=\alpha_0+\alpha_1 TPV_{i,t}+\alpha_2 Controls_{i,t}+\mu_i+\gamma_t+\varepsilon_{i,t} \tag{1}$$

The subscripts i and t represent the enterprise and year respectively. The explained variable (TPV) "Accounting personnel role transition pressure" indicates the accounting personnel role transition pressure situation of enterprise i in year t. The core explanatory variable (APT) "Artificial intelligence substitution effect" reflects the penetration substitution degree of enterprise i in year t. Controls denote a series of control variables. μ_i and γ_t represent individual fixed effects and time fixed effects respectively, while $\varepsilon_{i,t}$ it is the random error term. Details of the variables are shown in Table 1.

TABLE I.   VARIABLE DESCRIPTION

Variable type	Variable name	Variable symbol	Variable Description
Explained variable	Accounting personnel role transition pressure	TPV	The negative natural logarithm of the difference between the total number of CPA certificate holders and the total number of employees
Explanatory variable	Artificial intelligence substitution effect	APT	Ratio of IT personnel indicators to total number of employees
Control variable	Enterprise scale	Size	Natural logarithm of operating revenue
	Number of branch offices	BR	Number of branch offices
	Number of clients served	Clients	Total clients of the firm
	Experience structure	Exp_Struct	he ratio of certified public accountants with over 5 years of practice to the total number of certified public accountants

3.2   Sample Selection and Descriptive Statistics

With the cross-industry penetration of artificial intelligence technology since 2020, the data in this paper primarily originates from the annual comprehensive evaluation of the top 100 accounting firms published by the Chinese Institute of Certified Public Accountants from 2020 to 2023. Additionally, this study employs the ratio of IT personnel to total employees as a metric to measure the substitution effect of artificial intelligence [11, 12]. The negative natural logarithm of the difference between the total

number of CPA-certified personnel and the total number of employees is used to quantify the role transformation effect of accounting professionals. were obtained, and the sample data underwent a 1% winsorization treatment. The descriptive statistical results are presented in Table 2.

TABLE II.   DESCRIPTIVE STATISTICS OF KEY VARIABLES

	N	Mean	p50	SD	Min	Max
TPV	392	-5.33079236	-5.344720	1.84595172216	-9.273221	0
APT	392	.0141861209	.5803805	.025458142708	0	21.42857
Size	392	9.900120717	9.256889	1.44709389350	8.1472797	13.58291
BR	392	10.81	7	11.055	0	51
Clients	392	200.22	22	458.247392	0	5850
Exp_Struct	392	.2213422013	.1877097	.128067269966	.02586206	.6779661

4   Empirical Analysis

The complete regression results are presented in Table 3, where continuous variables have been winsorized at the 1% and 99% levels. The sample size is 400, with an F-value of 618.628. Additionally, the model's R^2 is 0.889, and the adjusted R^2 is 0.943, indicating that the independent variables in this model possess exceptionally strong explanatory power for the dependent variable. The regression coefficient of the core explanatory variable APT is 6.486 (p=0.000), which is significantly positive at the 1% level. This result confirms that the substitution effect of artificial intelligence technology significantly intensifies the role transformation pressure on accounting professionals. Specifically, for every one-unit increase in the AI substitution effect, the transformation pressure on accountants rises by 6.486 units.

Regarding control variables, the coefficient for enterprise scale (*Size*) is -0.620 (p=0.000), showing a significantly negative relationship, suggesting that economies of scale partially mitigate the transformation pressure induced by AI. Business complexity (*BR*) also exhibits a negative significance (β =-0.038, p=0.000), likely because the reliance on professional judgment in complex operations limits the scope of AI substitution. Notably, the expense structure (*Exp_Struct*) demonstrates the strongest positive influence (β =7.806, p=0.000), with a standardized coefficient of 0.542, implying that firms sensitive to labor costs are more inclined to drive transformation through technological substitution. In contrast, the impact of client numbers (*Clients*) does not reach statistical significance (p=0.933), possibly because its effect is absorbed by other organizational characteristic variables.

TABLE III.   MAIN REGRESSION RESULTS

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	-.607	.381		-1.594	.112
APT	6.486	1.242	.089	5.222	.000
Size	-.620	.040	-.486	-15.302	.000
BR	-.038	.005	-.228	-7.868	.000
Clients	6.968E-6	.000	.002	.084	.933
Exp_Struct	7.806	.264	.542	29.545	.000

Robustness Tests

Existing research methods for addressing endogeneity and conducting robustness tests can be broadly categorized into four types: instrumental variable approach, sub-sample regression method, replacement of explanatory variables, and alteration of clustering methods. Among these, the replacement of explanatory variables method can effectively examine endogenous issues such as sample self-selection, reverse causality, and omitted variables in the model. This paper selects the growth rate of CPA numbers as a replacement for accounting personnel as the instrumental variable for testing, with the test results shown in Table 4.

$$CPA_{i,t}=\alpha_0+\alpha_1 TPV_{i,t}+\alpha_2 Controls_{i,t}+\mu_i+\gamma_t+\varepsilon_{i,t} \tag{2}$$

The results of the replacement indicators are significantly positive, indicating that after mitigating the endogeneity issues in the model, the substitution effect of artificial intelligence continues to profoundly influence the role transformation of accounting professionals.

TABLE IV.   ROBUSTNESS TEST

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	2.235	.233		9.614	.000
APT	3.366	.763	.067	4.410	.000
Size	-.681	.025	-.775	-27.481	.000
BR	-.025	.003	-.221	-8.584	.000

Clients	-3.603E-5	.000	-.013	-.704	.482
Exp_Struct	-1.369	.158	-.141	-8.666	.000

5   Conclusions and Recommendations

AI's rapid advancement is redefining global occupational structures, with the accounting profession at the epicenter of functional and talent realignment. This study demonstrates AI's dominance in automating transactional tasks (e.g., document processing, reporting) but identifies limitations in strategic and ethical domains requiring human judgment. Key findings align with existing literature on technological boundaries, underscoring accountants' irreplaceability in higher-order functions.

To navigate this transition, firms should prioritize upskilling programs to foster strategic and analytical competencies. Policymakers must establish ethical frameworks for AI integration, addressing accountability and data governance challenges. Future research should explore cross-cultural comparisons and longitudinal impacts of AI adoption.

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