

Analysis of the Impact of GenAI on the High-Skilled Labor Market in the Financial Market

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Abstract. Since the release of ChatGPT in 2022, the rapid using of generative artificial intelligence (GenAI) has led a profound impact on the global labor market, with significance effects on occupations requiring high skill levels and advanced capabilities. Existing literature, however, has left a notable gap in analyzing the financial sector, a quintessentially high-skill-intensive industry. Focusing on high-skilled workers in the financial industry and basing on labor economics theories and prior research, this paper examines the mechanisms through which GenAI shapes the wage premium of high-skilled financial practitioners across three dimensions: short-term substitution effects, long-term enhanced effects, and heterogeneous impacts at the individual level. The results demonstrate that GenAI exhibits a reverse skill-biased pattern: in the short term, it displaces standardized routine cognitive tasks at entry levels, eroding the wage premium of junior positions; in the long term, it drives task restructuring through interpersonal collaboration, fueling a U-shaped rebound in compensation for senior talent while narrowing the salary gap between novice and seasoned practitioners. This study provides theoretical support for talent transformation in the financial sector, higher education optimization, and the formulation of employment security policies.

Keywords: GenAI, High-skilled labor, Financial Sector, Reverse skill bias

1. Introduction

Since the release of the ChatGPT in 2022, generative artificial intelligence (GenAI) has been rapidly popularized globally as a general technology. It covers an extremely wide scope of tasks and has generated huge impacts on the pattern of the global labor market. Different from some traditional automation technologies that mainly impact low-skilled and repetitive manual labor, GenAI achieves excellent performance in high-cognitive tasks including logical reasoning, code writing and document analysis, and has for the first time delivered large-scale impacts on the career ecology of financial white-collar workers and highly educated elite groups. A research by OpenAI and the University of Pennsylvania points out that large language models(LLM) will affect at least 10% of the work tasks of about 80% of the American labor force, and over 50%of the tasks of 19% of the population will be affected, such impact has a direct bearing on the return on investment of higher education in the financial field and the long-term accumulation of high-end human capital, and also

puts forward brand-new challenges to the talent structure, remuneration system and employment security of the financial industry.

In existing academic research, the theory of "skill-biased technological change"(SBTC) has long occupied a dominant position. It is believed that technological progress is usually biased towards the highly skilled labor and widens skill premiums and income gaps, However, the emergence of GenAI has challenged traditional framework: Eloundou et al. find that large language models produce more significant impact on high wage, highly educated occupations [1]. The GenAI occupational exposure index constructed by Felten et al. indicates that highly educated practitioners face higher substitution risks [2]. Noy and Zhang uncover GenAI's "great smoothing effect" - ChatGPT's promotion of task efficiency for "low-ability" subjects far exceeds that for "high ability" subjects [3]. Although existing studies have discussed the impacts of GenAI on the labor market, there is still insufficient segmented research targeting the financial industry, which is an industry intensive in high skills and cognition, and there is also a lack of analysis on the heterogeneous influences on wage premiums of practitioners with different working experience stages.

This paper targets high-skilled labor in the financial sector including financial data analysts, industry researchers, investment managers and senior key account managers, ect. Based on theoretical analysis and literature review, it puts forward three core logics. First, generative AI generates substitution effects in the short time, leading to a decline in the wage premium of entry-level high-skilled positions. Second, in the long run, financial practitioners rely on human-machine collaboration and shift their core work to high-end businesses such as strategic decision-making and business negotiation, and generative AI gradually exerts productivity enhancement effects to raise the compensation of high-end labor. Third, from the perspective of individual heterogeneity, generative AI acts as a virtual mentor for new entrants and delivers stronger empowerment effects on newcomers, which narrows the salary gap between senior experts and novice practitioners. Overall, generative AI has reverse skill-biased attributes, which distinguishes it from traditional skill-biased technological change. By replacing basic cognitive tasks undertaken by high-skilled groups, generative AI only reduces the wage premium of junior positions rather than continuously widening the industry's income gap. The research conclusions of this paper can provide references for financial institutions to optimize talent systems, universities to adjust finance education orientations, and governments to formulate high-end employment security policies.

2. Short-term "substitution effect" and damage to the wage premium of financial junior positions

In the early stage of GenAI fully penetrated the financial industry, the most intuitive manifestation of technological impact is the "substitution effect". Through low-cost and large-scale replication of specific work tasks, GenAI directly leads to the shrinkage of the relative demand for a large number of entry-level high-skill positions in the financial industry, thereby causing periodic erosion of their traditional wage premium.

From the perspective of micro-task attributes, this substitution effect does not work evenly on all positions, but focuses on specific types of high-cognition tasks. In order to clearly depict its impact boundary, this paper constructs a four-quadrant analysis matrix with two core dimensions, namely "degree of task standardization" and "hierarchy of task cognitive value", based on the task-based analytical framework. The horizontal axis represents the degree of task standardization, which is divided into high and low levels according to the clarity of task rules and replicability, corresponding to the classic classification of "routine cognitive tasks – non-routine cognitive tasks" in the task model. The vertical axis stands for the hierarchy of task cognitive value. Combined with

cognitive target classification theory and the job value chain of the financial industry, it is split into high and low levels by the decision weight and irreplaceability of tasks in value creation [4]. Through the cross classification of the two dimensions, the impact paths of generative AI on various financial tasks can be clearly demonstrated by the matrix (see Figure 1).

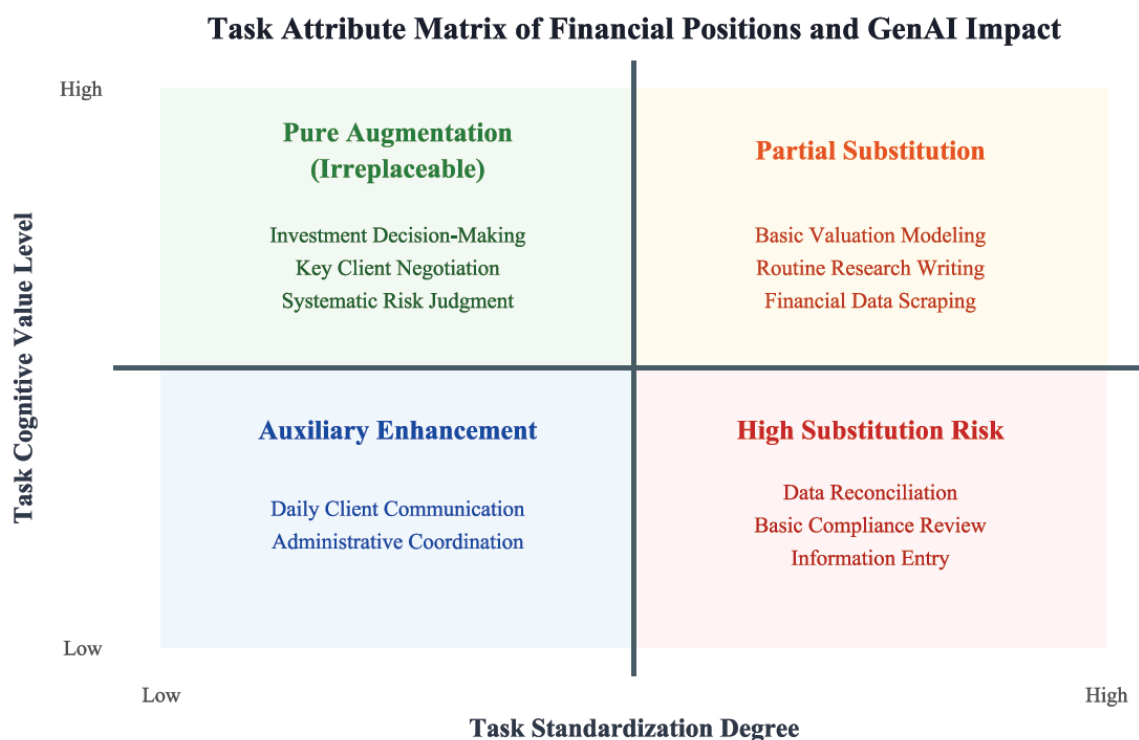


Figure 1. Financial position task attribute matrix and GenAI alternative path (photo credit: original)

In Figure 1, the high-standardization and entry-level high-cognitive tasks in the upper right quadrant correspond to the daily core work of junior researchers, analysts and other highly educated positions in the financial industry, and constitute the main scope of the short-run substitution effect brought by generative AI.

In the traditional financial industry organizational structure, although assistant industry researchers, junior data analysts, compliance assistants, investment bank junior analysts and other junior practitioners have high human capital endorsements such as masters from famous schools, their daily work is consists of numerous technically intensive yet highly structured "entry-level cognitive tasks", which fall squarely within the absolute advantage scope of Large Language Models.

On the one hand, passive substitution occurs in information retrieval and text refinement tasks. industry research assistants and investment banking analysts often need to spend hours tracking industry trends and reading hundreds of pages of prospectus and sorting out abstracts, LLMs can complete knowledge extraction and cross-check financial indicators within seconds at nearly zero marginal cost. This instantly eliminates the scarcity of knowledge-intensive tasks that once relied on manual human retrieval [1].

On the other hand, basic data cleaning and preliminary modeling work are automated. Junior analysts devote massive energy on SQL data extraction and construction of basic Excel valuation models. As large model-powered code interpreters and automated intelligence, AI can automatically write and debug quantitative scripts following natural language instructions. This perfectly fits the

logic of technological substitution for routine cognitive tasks in the task-based model proposed by Autor et al., and erases the skill barriers of junior technical staff [4].

This task-level substitution is directly transmitted to the supply and demand ends of the labor market. As stated by the general equilibrium theory of labor economics, labor prices are determined by marginal productivity and market supply and demand, and GenAI drastically distorts the supply-demand balance of entry-level financial talent markets in the short run. On the demand side, the AI occupational exposure index constructed by Felten et al. indicates that the financial industry bears the most direct pressure of job restructuring [2]. To cut costs and improve efficiency, financial institutions generally tighten recruitment standards and downsize staffing for junior positions. On the supply side, the global higher education system supplies a large number of masters majoring in finance and quantitative economics to the market every year. The hard skills these young people have spent years mastering in school, such as sorting financial statements and drafting preliminary industry comments, lose bargaining power in the face of AI's ultra-high efficiency and low costs. This micro mismatch between relatively oversupplied labor and absolutely shrinking demand directly leads to weakened wage premiums for entry-level roles. Junior white-collar workers with overlapping high-tech and financial expertise are experiencing transitional pain from diluted knowledge premiums, and some even fall into a new "white-collar middle-class trap" where high educational attainment fails to secure competitive starting salaries [5].

3. Long-term "enhanced effect" and the productivity boundary of human-computer coordination

Although the short-term substitution effect has caused widespread anxiety, from the perspective of dynamic evolution, the industry-wide proliferation of GenAI will eventually move beyond the "job displacement" stage and transform into a powerful "augmentation effect". Through internal task restructuring within organizations, it lifts total factor productivity and the compensation ceiling of high-end financial labor markets in the long run.

The improvement of industrial efficiency by general-purpose technology depends on the in-depth reorganization of the original production factors and the reconfiguration of the flow of service division of labor. This rule is especially obvious in the human-machine collaboration scenario of the financial industry [6].

According to the 2025 Financial Services Industry Report released by the World Economic Forum shows that across three major sub-sectors including banking, insurance and capital markets, 32% to 39% of the work tasks mainly standardized paperwork processing, data verification and basic compliance review, with high potential for automation substitution; Another 34% ~ 37% of the work is concentrated in the core links such as customer relationship management, risk decision-making, and complex transaction coordination, representing typical high human-machine collaboration augmentation tasks. This finding verifies the adjustment of internal task flows and division of labor structures in the financial sector [7].

Large-sample tracking research conducted by Brynjolfsson et al. on knowledge workers confirms that AI tools can liberate human employees from cumbersome, repetitive transactional labor. Their field experiment covering 5,179 corporate customer service employees indicates that after adopting generative AI tools, employees' average hourly problem-solving efficiency rises by 13.8%. Among them, novice employees with less than six months of tenure achieve a 35% productivity improvement, and the proportion of time spent on transactional work drops significantly [8].

Specifically in the financial industry, the research data of the McKinsey Global Research Institute shows that front-line financial practitioners use generative GenAI to complete information retrieval,

text refinement, policy compliance interpretation and other work, and the per capita efficiency can be improved by up to 60%, and the efficiency of code writing work can be improved by 55%; From the perspective of the industry as a whole, GenAI can unlock USD 200–340 billion in annual operating value for the global banking sector, equivalent to 9% to 15% of the industry's operating profits [9].

For senior fund managers, investment directors and senior key account managers, their core value never lies in memorizing or processing tables, but in risk decision-making, high-level business games and project negotiations in a complex market environment, and customer trust based on deep emotional connections. When GenAI, as an "efficiency amplifier", undertakes most of the desk, paperwork and basic data work, top financial talents can devote all their scarce energy to the "unstructured soft power moat" that GenAI cannot deconstruct. This "half-man model" of human-computer collaboration makes the customer service radius and project throughput of individual units explode geometrically, which greatly raises the marginal returns of high-end human capital.

From the micro wage pricing theory, the long-term real remuneration of workers must match the marginal value they create. When financial institutions complete the organizational transformation of "AI intelligent workflow reinvention", composite leaders who can skillfully use large models to carry out complex capital operation, transnational collaborative negotiation and advanced risk control, their scarcity is not only not weakened by algorithms, but also because they can multiply the AI capital. Output efficiency is more sought after by the market. Therefore, the impact of technological progress on the high-skilled labor market is not a linear destruction, but a U-shaped evolution trajectory of "short-term substitution pains — long-term augmentation rebound". High-end financial talents who have successfully completed the transformation of human-computer collaboration will usher in a real "value return" (see Figure 2).

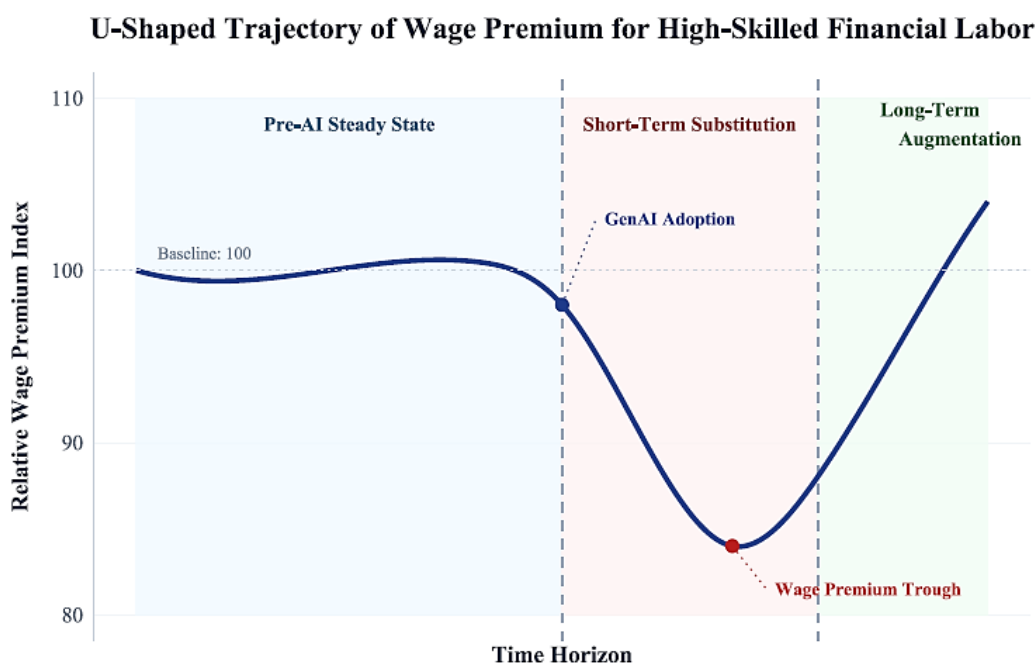


Figure 2. U-Shaped influence trajectory of GenAI on the wage premium of financial high-skilled labor (photo credit: original)

Note: Based on theoretical deduction and drawing, the benchmark value is 100 for the steady-state wage premium before the introduction of AI. The impact of GenAI on wage premium presents the U-shaped evolution characteristics of "falling to a trough in

the short run and rebounding in the long run", which is the result of the joint effect of short-term substitution and long-term enhancement effect.

4. Differentiation of influence: "Great Smoothing effect" and "skill popularization" in the financial industry

The traditional theory of "skill-biased technological progress" generally believes that the deepening of information technology is often accompanied by the widening of the "technology gap" [10]. GenAI has significantly increased the productivity of low-ability subjects than that of high-ability subjects and plays the role of "Great Equalizer". This effect is also summarized as the "Great Smoothing effect" in the academic community [3]. Mapped to the financial industry, this heterogeneous empowerment will not only narrow the productivity gap between new and old practitioners, but also further give rise to the trend of "skills popularization" - this article is: financial analysis, valuation modeling and other high-level skills, which were originally monopolized by senior experts, have been reduced by the popularity of AI tools. Entering the threshold, ordinary new practitioners can quickly master the basic ability through appropriate human-computer coordination, breaking the traditional monopoly of experience. This heterogeneous impact can be intuitively presented through the productivity comparison of new and old practitioners (see Figure 3).

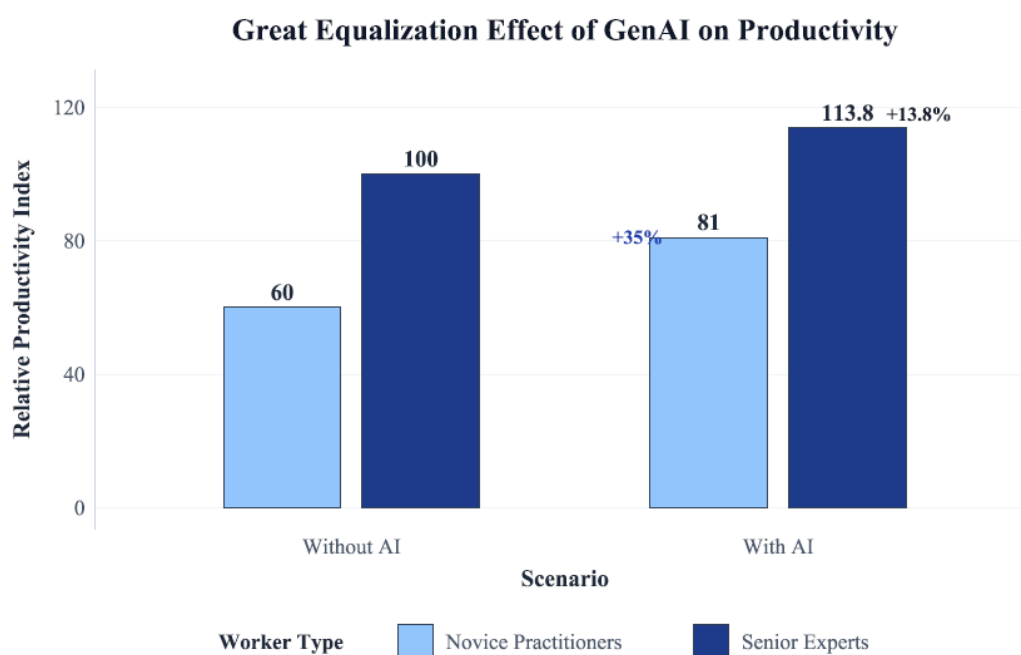


Figure 3. Comparison of the impact of GenAI on the productivity of new and old practitioners (photo credit: original)

Note: Based on the field experimental data drawing of Brynjolfsson and others, the productivity of senior experts without AI is based on the value of 100. The productivity increase of GenAI for novice practitioners (+35%) is significantly higher than that of senior experts (+13.8%), and the gap between the two is significantly narrowed, presenting a typical "big smoothing effect" [8].

In the traditional financial industry, "experience" and "industry intuition" are the core assets that maintain the "expert-novice" salary gap. Senior experts enjoy a high scarcity premium with industry barriers, information asymmetry advantages, and long "apprenticeship" precipitated knowledge and network monopoly; while novices must complete the accumulation of original knowledge through long-term low-paying transactional labor. When the large language model intervenes in knowledge

writing and business collaboration tasks, the efficiency and quality improvement of inexperienced novice subjects is far greater than that of experts who already have high productivity [3]. Mapped to the financial industry, GenAI actually plays the role of a "virtual mentor" for novices. Through the in-depth internalization of a large number of historical financial reports, regulatory regulations and valuation logic, it has broken the knowledge monopoly of senior experts. A junior practitioner with no industry precipitation can retrieve and absorb the industry atlas and report framework that veterans need to accumulate for several years within minutes through accurate prompts, and the basic output quality quickly approaches the industry average.

Research by Brynjolfsson and others further confirms that AI can precipitate and spread the best practices of high-performance employees, helping new employees quickly cross the experience curve [8]. When the basic and even intermediate financial analysis and quantitative modeling capabilities are no longer exclusively monopolized by senior experts, the scarcity premium of some traditional veteran groups is weakened by algorithms. This heterogeneity of "more empowering novices" has triggered the "popularization" tendency of advanced financial skills and continued to narrow the wage gap between experts and novices within the industry.

5. Conclusion

The impact of GenAI on the financial high-skill labor market shows a distinct "reverse skill bias" characteristic, which is significantly different from the rule that traditional technological progress widens the income gap. In the short term, AI replaces standardized entry-level cognitive tasks on a large scale. Coupled with the oversupply of highly educated financial talents, the traditional wage premium of junior positions is impaired, and some new entrants fall into the white-collar middle-class trap. In the long run, human-machine collaboration drives industry-wide task restructuring. Senior practitioners focus on high value-added decision-making businesses, and rising productivity brings a U-shaped rebound in compensation. At the heterogeneity level, AI acts as a virtual mentor for newcomers, popularizes the implicit experience of senior experts, triggers the "great smoothing effect", breaks the monopoly of experience, and narrows the salary gap between novice and veteran practitioners. This research conclusion not only enriches the connotation of the times of skill-biased technological progress theory, but also provides an important theoretical basis for the transformation of talents in the financial industry, the reform of higher education and the formulation of employment security policies.

Based on the above conclusions, this paper can explore the impact of GenAI on the financial high-skilled labor market from multiple levels. For financial institutions, they should look at the alternative effect of AI rationally, avoid blindly shrinking the staffing of junior positions, turn to promote the workflow reinvention of human-computer collaboration, and establish a hierarchically classified AI skills training system: strengthen the training of AI tool application ability for junior practitioners to help them quickly leapfrog Experience curve; focus on AI-assisted decision-making ability cultivation for senior practitioners, and fully unleash the productivity potential of the "Centaur model". For the higher education system, it is necessary to adjust the talent training plan of financial majors, appropriately compress the training proportion of standardized financial analysis, data processing and other skills, strengthen the cultivation of AI-hard-replaceable soft skills such as critical thinking, complex risk decision-making and customer relationship management, and adapt to the AI era from the source. The demand for financial talents. For policymakers, a short-term transition guarantee mechanism for the financial labor market should be established to provide job transfer training subsidies and employment guidance for junior practitioners impacted by AI. At the

same time, the society should improve the regulatory framework for the application of AI in the financial industry, and guide technology to ensure employment stability while improving efficiency.

This research still has certain limitations. First of all, this article mainly puts forward an analytical framework based on theoretical deduction and literature combing. The follow-up research can empirically test the U-shaped trajectory and "great smoothing effect" of GenAI affecting wage premiums with the help of micro-labor data of the financial industry or research data at the enterprise level, and further verify the conclusion. Secondly, this article analyzes the common characteristics of the financial industry as a whole. In the future, it can further subdivide different sub-industries such as banks, securities, insurance and funds, and explore the industry heterogeneity of the impact of GenAI. Finally, this article focuses on the dimensions of wage premium and productivity. Follow-up research can be expanded to richer labor market results such as career mobility, job quality and employment satisfaction, and more comprehensively portrays the impact of GenAI on the financial high-skilled workforce.

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