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Investigation into Custom-Built Operational Models for Small and Medium-Sized Commercial Banks

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Abstract: This research centers on commercial banks' human resource allocation. It constructs a staffing model grounded in human capital value creation theory and analyzes relevant factors through longitudinal panel data regression. Taking City Commercial Bank A as an instance, the model identifies 12.3% redundant positions and matches jobs with business scale. Additionally, the study proposes a "staffing effectiveness salary" system, providing a framework for optimizing commercial bank human capital in the digital age.

Keywords: Commercial banks; Staffing optimization; Human capital contribution rate; Cost elasticity; Performance linkage

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1. Introduction

The global financial landscape is evolving. Financial market reforms are deepening, and Internet finance, with its cost advantage, is emerging and challenging traditional banks by meeting diverse financial needs. As key regional players in the traditional banking system, small and medium-sized banks must innovate HR strategies to enhance competitiveness. However, their existing structures and job position setups struggle to keep up with business growth and innovation. Allocating resources to match strategies and improve efficiency is crucial, and staffing is a key part of this.

Currently, small and medium-sized banks need to boost their organizational and management efficiency. Their growing business and changing market environment demand more from human resource management, and traditional methods are no longer sufficient.

Staffing, a specialized and critical HR management task, is guided by business goals and considers factors like costs, asset scale, and industry benchmarks in this study's macro-scheduling model. It overcomes single-method limitations, ensuring data-driven resource allocation and better internal management.

This study uses City Commercial Bank A as a case to explore enhancing internal management through scientific staffing optimization. Small and medium-sized banks often face issues like irrational job position allocation and low efficiency, so systematic analysis is needed. Bank staffing impacts operation, cost control,

and competitiveness, and research in this area has drawn much attention. This paper reviews bank customization research, including theories, methods, and more.

2. Literature review

Commercial bank customized systems rest on a multi-disciplinary framework. Core theories involve Strategic Human Capital Allocation Theory [1], derived from the dynamic capabilities theory. It employs a strategic HR planning model to dynamically adapt business scale, organizational structure, and human resources, maximizing human capital input benefits. Post Value Evaluation Theory [2]: Derived from the work analysis paradigm of the scientific management school, after the modern post evaluation system is upgraded, the post value matrix is constructed with responsibility-ability-output, and the relevant indicators are quantified. Organizational efficiency-driven theory [3]: Focuses on the coupling of organizational structure and human configuration and puts forward the concept of organizational energy efficiency ratio. Research shows that flat architecture can improve the efficiency of manpower allocation, but it needs the support of process reengineering and digital tools.

The foundation stage of classical theory (1870s–1950s): Adam Smith's division of labor theory promotes the design of job specialization; Taylor's scientific management theory establishes the principle of "work simplification;" Max Weber's hierarchical theory lays the foundation of post system standardization. During the behavioral science phase (1960s–1990s), Herzberg's Two-Factor Theory differentiated motivators and hygiene factors to enhance job design. At the same time, Hackman and Oldham's Job Characteristics Model linked core work dimensions to psychological outcomes. Smith *et al*. proposed that the pressure-post characteristic model reveals the regulating effect of post autonomy and feedback mechanism on job burnout. Modern integration development stage (21st century): In the strategic adaptation theory, Hyatt *et al*. demonstrated a positive link between role clarity, decision autonomy, and organizational performance; under the contingency design theory, Poppleton builds the post design decision tree model based on environmental uncertainty; in the digital empowerment theory, Grant proposed a dynamic post configuration framework driven by algorithm [4].

The study of staffing optimization began in the 1870s and 1880s. Taylors scientific management principle takes work simplification as the core and is an important method of early job systematic design. In 1959, the two-factor theory of incentive health care prompted enterprises to pay attention to the design of work content. The work characteristic model of Oldham *et al*. can be used for new job design and old job optimization [5]. Michael *et al.* generalized the related theories and constructed the physical model [6]. Some scholars use a variety of factors to improve employee performance based on the work characteristic model. Hyatt found that job settings considered multiple factors, and strategies should be selected based on production uncertainty [7]. Poppleton summarized new work-organization design methods, Adam studied incentive staffing optimization, Paul proposed the Zero-base staffing method, and Western scholars focused on work efficiency and other aspects of staffing research [8,9].

3. Current situation analysis

Staffing head office functional departments in small and medium-sized commercial banks is challenging, with three main issues. Decision-making lacks a scientific basis; HR decisions are often based on subjective experience rather than data-driven analysis, leading to misalignment with operational demands.

Improper selection of fixed methods: There are significant differences in the functions and businesses of different departments. However, many human resource managers often ignore these differences when choosing fixed methods and do not understand the fixed methods applicable to different departments, resulting in a large deviation between the results and the actual situation.

Lack of standardized benchmarks impedes alignment with industry best practices, and there is a lack of unified standards for the proportion of functional departments of the head office in the industry, which makes banks lack of reliable reference basis in the process of staffing, which increases the difficulty of staffing.

Small and medium-sized commercial banks face numerous challenges in staffing. Although there are many methodologies, for the head office of the head office functional departments cannot be generalized, mechanically copied, and need to be analyzed according to the specific situation. Compared with large state-owned commercial banks and national joint-stock commercial banks, urban commercial banks have the characteristics of regional operation and relatively limited resources, which makes cost management, especially human cost management, become the focus of their operation and management. Therefore, scientific compilation is of great significance for City Commercial Banks to reasonably control costs and improve operational efficiency.

4. Challenges faced

Staffing is a difficult problem in bank HR management. It requires determining the appropriate number of employees, understanding department needs, and avoiding experience-based design.

This study takes the allocation of functional departments of the head office of Bank A as the entry point, based on the theory of strategic human resource management, explores the method of functional departments of the head office of small and medium-sized commercial banks, reveals the establishment management difficulties of urban commercial banks and proposes solutions:

Shifting from empirical to scientific decision-making: Banks often rely on experience. The City Commercial Bank's HR department simply adjusts historical staffing or takes extreme measures when performance declines, lacking objective analysis. When handling other departments' applications, it judges by common sense, leading to budget-allocation information asymmetry and frequent bargaining between the HR department and business departments.

If the specific adjustment is delegated to the department (or branch), although the department understands the reality, but lacks the analysis method and basis, which can easily cause contradictions.

Differentiation analysis and judgment: The post management and development goals of different departments of City Commercial Banks are different, which are closely related to the nature and system of the departments. The determination of the different nature of the department post establishment needs in-depth analysis, but the current judgment is hasty, lacks detailed analysis, resulting in the results and actual inconsistency, and the establishment of a rigid setting. This may lead to the inability to introduce suitable talents due to staffing restrictions, which will affect efficiency, or unreasonable staffing allocation of some departments, resulting in unreasonable workload and staffing.

Balancing cost control and labor efficiency remains a critical challenge. Banks must weigh the trade-offs between lean staffing (which risks overburdening employees) and excessive staffing (which escalates costs), requiring a holistic approach to optimize resource allocation.

Considering the cultural characteristics and management concept of urban commercial banks, at present, there is a lack of unified norms in the staffing process, which is influenced by the management concept, mode, and personnel of the bank. Different banks have different requirements for work fullness, and different branches of the same bank may also have differences in staffing ideas and methods due to historical and regional factors.

5. Design and strategies

City Commercial Bank staffing consists of two steps: Macro and micro. Before staffing, post determination,

and work structure/workload analysis are necessary, followed by macro and micro staffing. Macro-level staffing aligns strategic goals with industry benchmarks (e.g., allocating 70% to operations and 30% to management) to optimize human capital allocation (e.g., management vs. operational staff), thereby aligning human capital with organizational goals, human cost control, and other macro levels. Micro-arrangement is to determine the specific number of personnel for each department in the post, to provide a basis for each department to clarify the post personnel allocation. In the aspect of post-establishment management, macro monitoring should be combined with independent adjustment. The human resources department is responsible for macro-control and monitoring, while the business department will face changes in personnel demand due to business changes, so it needs to have certain authority to adjust it independently. Next, the macro allocation process of A City firm is introduced in detail.

5.1. Determine the customized model

In the process of the allocation, first of all, through the analysis of the banking industry, the company from micro analysis to macro analysis, refine and summarize the main influencing factors of the overall city firms, determine the key drivers of the allocation, and then combined with the actual situation and dynamic development of A City firms, establish A model.

Through the overall analysis, based on the strategic management objectives of A City firms, we determine three main driving factors: cost and profit analysis, business scale analysis and scale effect analysis of the main branches, to obtain the overall establishment of A City firms; then through department analysis and post analysis, based on the different development orientation of the department, as illustrated in **Figure 1**.

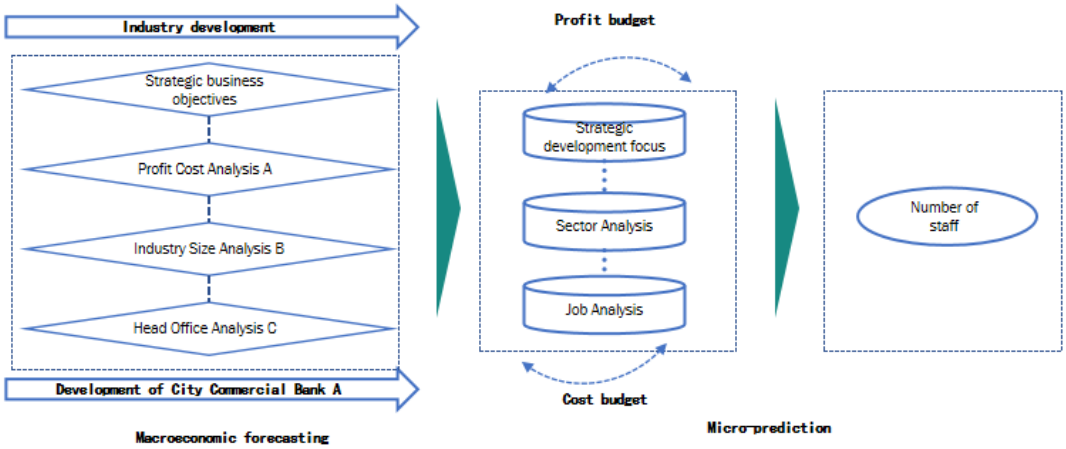

Figure 1. Staffing model of Bank A

Among them, the three main driving factors are as follows: The profit cost analysis is the basis of the bank; the reasonable profit scope is the premise of effective regulation of human cost; the human factor is the main cost and the key to profit consumption; the business scale analysis depends on the distribution and control strategy of the branch and the branch is the business unit replication, and the number and scale have a significant influence on the allocation.

5.2. Prediction steps

Through the analysis of the key driving factors and the comprehensive consideration of all related factors, the macro classification forecast is mainly divided into the following four steps: the first step is the profit cost analysis; The second step involves industry scale analysis; the third step is the head and branch office analysis.

6. Results

6.1. Profit cost analysis

(1) Forecast profit: Make an in-depth analysis of the strategic objectives of A City Commercial Bank, combine its current business development status, market capacity, and prospects, and use relatively optimistic asset scale and profit growth data to forecast. The next five years, the asset scale and total profits of Bank A are shown in **Figure 2** below. Through the analysis of the asset scale and total profit growth in 2022–2024, it can be predicted that the asset scale and total profits in 2025 will be 83.9 billion yuan and 776 million yuan, respectively.

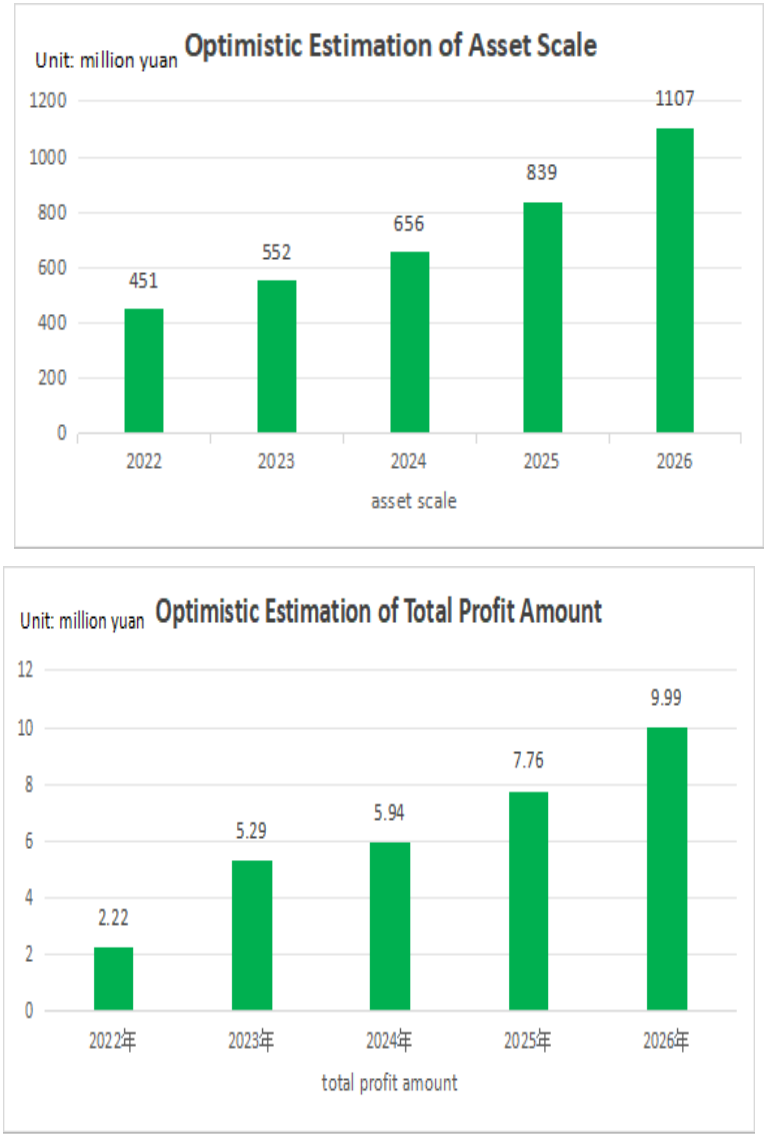

Figure 2. Profit forecast table of Bank A (forecast under the condition that the asset scale growth rate is 22.9%)

(2) Evaluation of the contribution rate of labor cost: Compared with the historical data of the development of Bank A in 2019–2021, it is found that with the gradual decline of profits, labor cost increased significantly, resulting in a significant decline in the contribution rate of labor cost, with an average of 0.91 as shown in **Figure 3**. Among them, per capita profit = profit income/number; per capita cost = total human cost/number; human cost contribution = profit income/total human resource cost. This data indicates the profit output of one yuan per input.

Indicators such as human resources and profits from 2019 to 2021

Year	Profit (in ten thousand yuan)	Total Human Cost (in ten thousand yuan)	population	Per Capita Profit (in ten thousand yuan per person)	Per Capita Cost (in ten thousand yuan per person)	Contribution of Human Cost
2021	5749	13000	1437	4.00	9.05	0.44
2020	10432	11507	1369	7.62	8.41	0.91
2019	12102	8787	1327	9.12	6.62	1.38
average	--			6.91	8.02	0.91

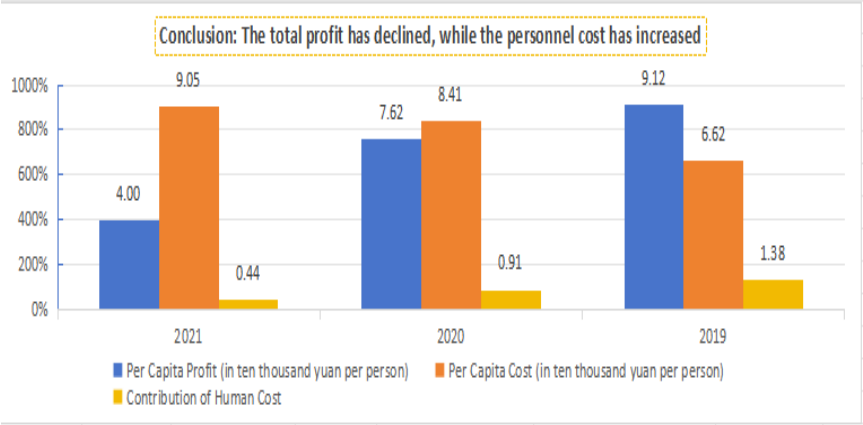

Figure 3. The contribution rate of labor cost of A City Bank

At the same time, refer to the same type of city firms in 2021 annual report, can conclude that human cost contribution rate, such as bank of Beijing 3.82, 3.27, Nanjing bank, Hangzhou bank 3.84, in short, the average city bank human cost contribution rate in 3.84, so A City firms is much higher than the same City Commercial Banks. A City firms is compared with other city firms 10 times, and on the human cost contribution difference by 4 times: 3.84/0.91, the labor cost relative to profit, belongs to the relatively high.

(3) Forecast the total labor cost of A City firms: According to the forecast annual profit situation and labor cost contribution rate of A City firms, forecast the total labor cost to obtain the estimated range of the total labor cost. To this, according to the previous analysis, we can see that A City firms of human cost contribution rate is relatively high, so, considering the cost of human resource management, we of human cost contribution rate in three ways (select the three typical human cost contribution rate data: a. 2021 A City firm human cost contribution rate, b. A City firm in the past three years lowest human cost contribution rate, c. The average human cost contribution rate is shown in **Table 1**.

Table 1. Estimated annual total human cost from 2022 to 2026 in three categories

Year	Profit (RMB M)	Cost rate 1 (2021)	Cost rate 2 (best in 3 years)	Cost rate 3 (average)	Total cost 1 (RMB M)	Total cost 2 (RMB M)	Total cost 3 (RMB M)
2022	21,158	0.44	1.38	2.38	48,086	15,332	8,890
2023	51,925	0.44	1.38	2.38	118,011	37,627	21,817
2024	58,393	0.44	1.38	2.38	132,711	42,314	24,535
2025	76,634	0.44	1.38	2.38	174,168	55,532	32,199
2026	99,884	0.44	1.38	2.38	227,009	72,380	41,968

According to the profit-based cost analysis, Thus, we draw the conclusion of pre-compiled labor cost: Considering the management development and future regulation of commercial banks in A City, We interval the data for the total human cost forecast, That is, the three prediction methods are used to finally obtain the regional number range, To ensure that the data has some flexibility and practical significance, According to the formula of "Total human cost = annual profit target/labor cost contribution," Calculate the estimated range of labor cost of A City Commercial Banks from 2022 to 2026: 153.32–88.9 million yuan in 2022; In 2023, RMB 376.27 million to RMB 218.17 million yuan; In 2024, 42,314–245.35 million yuan; 555,5532–32.199 million yuan in 2025; In 2026, it will be 72,380 to 419.68 million yuan.

(4) Accounting per capita labor cost: based on the forecast total labor cost range, combined with the per capita cost of the previous year and the current growth of labor cost, the per capita labor cost is predicted to be obtained for the estimated staffing. Among them, the estimated labor cost = last year's labor cost (1 + N%). (According to the comprehensive factors such as industry growth forecast, industry wage level, and life changes, it is preliminarily determined that the per capita increase in 2022 is 15% compared with 2021, so that the annual per capita labor cost increase N is 15%.)

At the same time, three kinds of forecasts are made for preparation, among which, estimated staffing = estimated total labor cost/estimated per capita labor cost, which are also predicted in three ways, as shown in **Table 2**.

Table 2. Forecasted per-capita labor cost of A City Bank

Total labor cost of previous year (in ten thousand yuan)	Population of previous year	Per-capita cost of previous year (in ten thousand yuan)	Expected per-capita labor cost (in ten thousand yuan)	Estimated staffing level 1	Estimated staffing level 2	Estimated staffing level 3
13,000	1,437	9.05	10.40	4,622	1,474	855
15,332	1,450	10.57	12.16	9,705	3,094	1,794
21,817	1,794	12.16	13.99	9,489	3,026	1,754
24,535	1,800	13.63	15.68	11,111	3,543	2,054
32,199	2,054	15.68	18.03	12,592	4,015	2,328

(5) Estimated staffing: Based on the above annual profit and human cost contribution, And derive the projected total labor cost in three ways, at the same time, Considering the adjustment and contractility of future management, Using the interval of the total human costs, As a result: in 2022, The staffing range is expected to be 855–1,474 people; In 2023, It is estimated that the manpower staffing range is 1,794–3,094 people; In 2024, It is estimated that the manpower staffing range is 1,754–3,026 people; In 2025, It is estimated that the manpower staffing range is 2,054–3,543 people; In 2026, It is estimated that the manpower establishment range is from 2,328 to 4,015 people.

In short, profit cost analysis is a common prediction method that combines profit development with personnel cost. It is widely used in various industries and has certain advantages for personnel development and cost control. However, this method is more suitable for the production of enterprises closely related to profits and personnel. In enterprises that do not correspond one-to-one, such as investment banks, staffing cannot be determined based on profit, it is only one of the factors to consider.

6.2. Industry scale analysis

(1) Analysis of asset ratio per capita: Select typical national joint-stock commercial banks and urban firms

to chart the per capita asset size. It can be seen that national commercial banks with assets below 100 billion are relatively low, with A total average of 0.42 and 0.25, as shown in **Figure 4**.

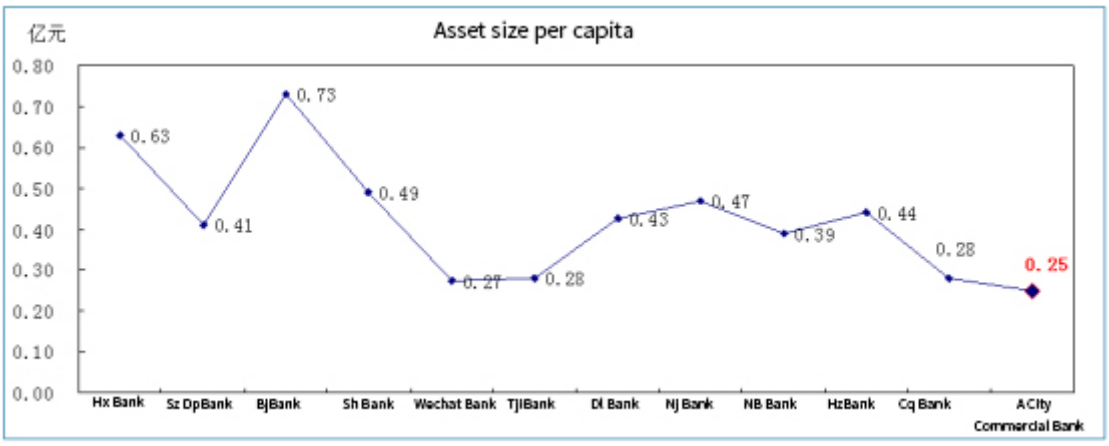

Figure 4. Per capita asset size of banks

(2) Considering the data of national commercial joint-stock commercial banks and urban commercial banks, with assets of 5,000–10,000 billion yuan, they have an average number of about 18,000, and an average ratio of about 0.52. Thus, compared with the larger joint-stock commercial banks, the number of urban commercial banks is smaller, and the per capita assets are smaller.

(3) The fitting assets and staff compiled data formula, and according to the A City firm actual forecast: according to the size and number of assets, we predict the size and establishment of the dynamic relationship, among them, to avoid the data method using the superposition of bias, we use the data fitting, draw the scale of the simulation prediction formula y = 1.7362x + 537.85 as shown in **Figure 5**.

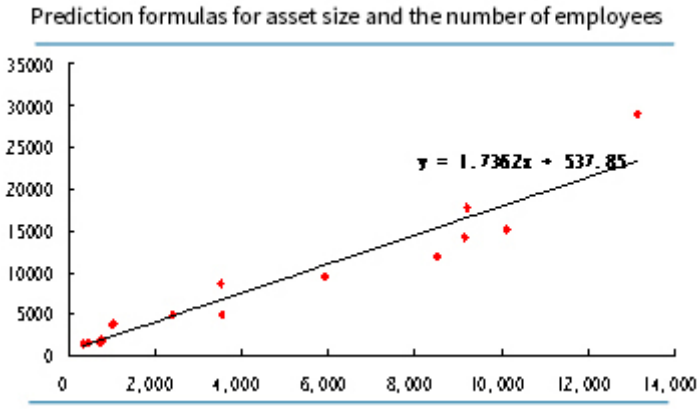

Figure 5. Fitting figure of the number of bank assets size

Combined with the historical data of A City firm in the past three years, its staffing is predicted according to the industry scale. From 2022 to 2026, when the asset scale is 441–100.7 billion yuan, the corresponding staffing is 1,304–2,286 people, respectively. The asset scale prediction method can be controlled according to the business scale based on the macro scale development, but it is only applicable to enterprises closely related to personnel. If the number of people and profits are not one-to-one, it needs to be further considered and is one of the factors considered in the compilation.

6.3. Head office and branch office analysis

Analyzing the composition and development trend of the number of banks, there is a scale effect on the expansion of the number of banks. The number of people in the head office is stable, the annual change is small; when branches, branches and branches increase, the number of people will increase exponentially, with each new branch. The number will increase substantially, so the increase in branches is the scale effect of expanding staffing.

(1) Analysis of the proportion of branches and branches have a certain number of people, while the proportion of the head office is 21.35%, the lowest bank of Shanghai is 16.73%, and the highest is the Bank of Nanjing, 27.32%, as shown in **Table 3**. A City firm belongs to 17.48% in 2019, 8.70% in 2020, and 21.09% in 2021. Although it is increasing year by year, it belongs to the middle level and is an acceptable range.

Table 3. Proportion and average number of employees in branches of A City Bank

NO.	Bank name	Total number of employees	Head office proportion	Branch			Total number of people
				Number of branches	Total number of branch employees	Branch average	
1	Bank of Beijing	910	18.75%	123	3,944	32	4,854
2	Bank of Shanghai	820	16.73%	207	4,082	20	4,902
3	Bank of Ningbo	458	23.57%	72	1,485	21	1,943
4	Bank of Nanjing	445	27.32%	58	1,184	20	1,629
5	Bank of Hangzhou	320	20.37%	74	1,251	17	1,571
6	Bank of Qingdao	412	27.84%	54	1,068	20	1,480

(2) According to the analysis of the number of general branches, the number of branches of A City Bank is determined based on the average number of branches of domestic city banks and the actual situation of A City Bank, as shown in **Table 4**. We conclude that the number of branches of A City Commercial Bank: the general branch is between 80–100 people, the first sub-branch is 50–70 people, the second sub-branch is 15–30 people, and the savings office is 5–15 people.

(3) According to the size relationship of branches and branches, the overall number of A City Commercial Banks is forecast.

Table 4. Forecast of businesses in A City

Year	Head office 1 (16.73%)	Head office 2 (20.37%)	Head office 3 (21.35%)	Branches	Total Staffing 1	Total Staffing 2	Total Staffing 3
2022	268	410	473	1,334	1,602	1,744	1,807
2023	308	471	544	1,534	1,842	2,005	2,078
2024	348	533	615	1,734	2,082	2,267	2,349
2025	389	594	686	1,934	2,323	2,528	2,620
2026	429	656	757	2,134	2,563	2,790	2,891

Thus, the manpower forecast intervals are as follows: 2022: 1,602–1,744; 2023: 1,842–2,005; 2024: 2,082–2,267; 2025: 2,323–2,528; 2026: 2,563–2,790.

6.4. Overall preparation and fitting

Considering the limitations and advantages of each predictor, and to avoid prediction deviation superposition, we determined the weighted average and multiplier for the prediction based on actual analysis and continuous

communication with A City firm management: prepare forecast = a 15% + a 70% + b + c 15% as shown in **Table 5**.

Table 5. Three factors of prediction interval

A. Staffing forecast by cost-profit analysis		B. Staffing forecast by asset scale analysis			C. Staffing forecast by head office and branch analysis	
Year	Expected staffing range	Year	Asset scale	Staffing forecast	Year	Expected staffing scale
2022	855–1,474	2022	441	1,304	2022	1,602–1,744
2023	1,794–3,094	2023	542	1,480	2023	1,842–2,005
2024	1,754–3,026	2024	667	1,695	2024	2,082–2,267
2025	2,054–3,543	2025	819	1,960	2025	2,323–2,528
2026	2,328–4,015	2026	1,007	2,286	2026	2,563–2,790

6.5. Findings and discussion

The staffing forecast for Bank A from 2022 to 2026 is 1,281–1,396, 1,581–1,801, 1,762–1,981, 2,029–2,283, and 2,334–2,621. Staffing is crucial in bank HR management, essential for performance appraisal, salary incentives, and cost control. It clarifies structures, improves efficiency, and requires continuous adjustment.

This study introduces a multi-criteria framework for staffing optimization in small and medium-sized banks, balancing cost-efficiency, scalability, and strategic alignment. It integrates multi-dimensional factors through empirical and analytical methods, providing tools for fixed posts and staff evaluation, and offering optimization plans to enhance internal management and competitiveness. The main achievements and innovations are as follows:

(1) Innovate the method of identifying problems, construct the classification level evaluation model of small and medium-sized commercial banks, use the fuzzy comprehensive evaluation method to evaluate the classification level of commercial banks in A City, and identify the problems of unbalanced post load and low matching degree between personnel and posts.

(2) Taking the optimization of A City firm as an example, it verifies the practical value of the evaluation model and optimization scheme and provides new perspectives, methods, and optimization reference for the management of similar institutions.

This paper has made some achievements in the research of A Rural Commercial Bank, but there are still deficiencies and problems to be studied:

(3) The model's applicability may vary across regions due to contextual differences. In the future, the data can be expanded, and the model can be refined and improved to improve the universality and reliability.

(4) Only the study of A City business, although representative, cannot fully reflect its fixed posts and staff situation. In the future, the sample scope should be expanded, and urban banks of different regions and sizes should be analyzed.

(5) While the optimization scheme has achieved remarkable empirical results, it lacks long-term tracking, evaluation, and consideration of sustainability and stability. Future research should explore the long-term mechanisms of fixed post and staffing optimization.

(6) It is of great significance to improve operational efficiency and competitiveness. In the future research, we should combine the development trend of intelligence, globalization and sustainability, use big data and AI driven customized system, verify the compliance through the pilot of fintech innovation

supervision, optimize the compilation management, improve the prediction accuracy, and provide support and guidance for the high-quality development of the banking industry.

(7) Concerning relevant regulations and policies, we promoted the formulation of the Guidelines for Human Resource Efficiency Evaluation of Small and Medium-sized Commercial Banks and included the contribution rate of labor cost and the elasticity coefficient of post establishment into the regulatory assessment indicators.

(8) Urban commercial banks, including rural commercial banks, are encouraged to adopt flexible staffing methods, such as "basic establishment + seasonal employment" in inclusive finance departments, to balance service efficiency and cost control.

Disclosure statement

The authors declare no conflict of interest.

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