

COVID-19's Impact on Recruitment of China's Banking Industry and Other Financial Sectors

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Abstract. Under the COVID-19 the global economy experienced an unprecedented shock and shows characteristics never be seen in history, so as the financial field, especially the banking sector in China. The paper mainly focuses on exploring how the recruitment in China's financial industry is affected by the pandemic, including the capital of various financial institutions and the recruitment number of banks. To draw a relationship between economic growth and the employment of financial institutions, this paper tries to identify whether the Phillips Curves is applicable to explain the performance of banking sector and its recruitment under COVID-19. The authors utilize data of national economy and employment in the financial industry, and by operating regression and hypothesis testing, this paper finds out the classic Phillips Curve doesn't hold for the banking sector in China during COVID-19. Empirical and statistical evidence shows that, the simple linear relationship between inflation and employment doesn't exist in the banking sector from 2017 to 2021.

Keywords: COVID-19; China's banking industry; Recruitment.

1. Introduction

The strike of COVID-19 has inflicted enormous impact on the global economy and financial system. According to Global Economic Prospects by the World Bank, the COVID-19 is leading to the deepest global recession since the Second World War, with the worldwide economy shrinking by 5.2%, causing at least 88 million people to extreme poverty. The merchandise trade volume plunged by 8% until May 2020, as The Organization for Economic Cooperation and Development (OECD) reported. Even though the deficit has significantly improved in 2021 and 2022, the repeated outbreaks of COVID and diagnosis of new variants like Delta and Omicron have consistently struck the global economy and significantly damped economic confidence, with recent lockdowns in Shanghai resulting in a 14% downturn in its local economy. Under such a chaotic social context, the labor market also experienced extensive damage. International Labor Organization (ILO) reported that total working hours in 2020 have decreased by 8.8% compared to the last quarter in 2019, with drastic job losses of 114 million. For those economies with existing financial difficulties, the COVID-19 has been more damaging, as they were exposed to and exacerbated the economic vulnerability built up over the past decade in low-interest rates and volatility. Researchers suggest that the coronavirus outbreak inflicted prominent volatility on global financial markets, with U.S. stocks value melt down for four times in less than two weeks. The resulting economic downturn also triggered fundamental adjustments in the worldwide capital market. Besides, stock valuation is at a superficial level in history. Meanwhile, continued low-interest rates may further pressure commercial banks' profitability for several years. In any dynamic economy, healthy banks would play a crucial role in overall financial stability. Banks that fail to generate profits are less likely to provide loans and other financial services, leaving the economy without much-needed credit.

This research paper aims to form an analysis on COVID-19's influence on recruitment in the financial industry, especially the banking sector. John asserted that banks, by nature, are prone to economic downturns because nonperforming loans and the extreme cases of bank runs are more possible to occur [1]. Lagoarde-Segot and Leoni developed a theoretical model showing that the

banking industry's collapse in developing countries increases as the joint prevalence of significant pandemics increases [2]. Skoufias stated that many banks' lending to the poor and the group lending of microfinance institutions will be pressured in times of epidemics because all group members will be put under the pressure of aggregate shock [3]. And according to Binswanger and Rosenzweig, financial institutions in rural areas will be subject to bank runs during floods or crop failures [4]. Nevertheless, the impact of COVID-19 on the practices of financial institutions remains uncertain. To attain a clearer picture of the performance of the banking sector under COVID-19, Asli, Alvaro, and Claudia's paper utilized the stock prices of worldwide banks to evaluate the effect of COVID on the banking sector. Moreover, they integrate the stock market price effects with financial policy responses to combat the pandemic, which provide a comprehensive view of the effects on banking sector. They gathered data including stock prices, accounting conditions and ownership data for 52 countries covering 896 commercial banks, the result indicate a systematic underperformance of bank stocks during COVID outbreak, between March and April of 2020 [5].

To analyze the relationship between economic performance and employment rate, a classic model is the Phillips Curve. According to the model, unemployment and inflation rate follow a relationship that is inversely proportional, because inflation occurs as a result of economic development, and with economic growth comes more jobs. Higgins discovered that the data of unemployment and inflation manifests a significant inverse relationship at the city size by census region level during pandemic, while inflation and employment-population rate follows a stronger positive relationship [6]. Crump, Eusepi, Giannoni and Şahin observed that the natural rate of unemployment in United States has increased to 5.9% by the end of 2021, compared to a natural rate of around 4.5% before the onset of pandemic. They acknowledged that this prominent increase was ascribed to strong wage growth rather than alternations in inflation expectations. While natural rate of unemployment increases, actual unemployment rate continued to fall and reached to 4.2%, reflecting the vigorous national economic development which have been pushing down the unemployment rate over the last 3 decades [7]. However, the Phillips Curve doesn't seem to work so well in China as in the US. Based on inflation dynamics from 1987 to 2014 in China, Egan and Leddin found that the Chinese Phillips curve manifests a non-linear relationship. That is to say, the inflation/output curve is in a concave shape [8]. Similarly, Zhang provided empirical evidence that indicate significant nonlinearities in China's Phillips curve [9]. Regarding the relationship between inflation and banks, Tan and Floros exhibited that the relationship between inflation and bank profitability, banking sector development, stock market development and cost efficiency is positive in China [10]. However, the applicability of Phillips Curve in China during COVID-19 as well as the relationship between recruitment in banking sector and inflation remain unexplored. In contrast to the underperformance of banking sector, Chinese internet finance was affected for good during COVID-19. This is a promising business area which revolutionized the traditional payment and investment method, offering new solutions and channels for financial institutions and companies. While widespread lockdowns hampered offline business and trade, people switched to online platforms for business. The exploration of online opportunities creates more demand for internet finance. This article also provides preliminary comparison between the performance of traditional banks and the internet finance industry.

2. Method

To explore the impact of COVID-19 on financial industry recruitment, it is necessary to have a general overview of the development of China's financial industry, both before and after the strike of COVID-19.

According to CFA Institute and China Banking and Insurance Regulatory Commission (CBIRC), the total assets value of China's banking and financial institutions reached 261.4 trillion CNY at the end of 2018, rapidly increasing by 15.62 trillion CNY from the end of 2017 with a 6.4 percent annual growth rate. As demonstrated in Figure 1, the banking industry's total assets rose steadily, with the year-on-year (YOY) growth rate gradually declining. It can be observed from figure 2 that the growth

rate of financial industry has been gradually declining before the onset of COVID-19, and the growth of banking sector has been lower than insurance and securities. Due to the economic slowdown and structural adjustment, the banking industry has terminated its prosperous era with high growth and now facing new challenges during business transformation.

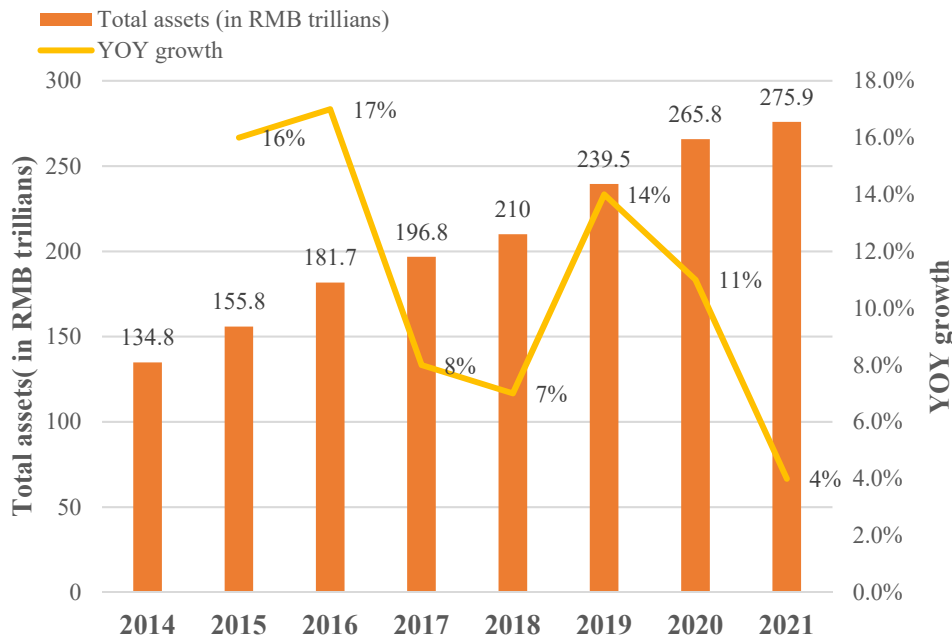


Fig. 1 Commercial banks’ total assets (in RMB trillions). Source: Wind, KPMG analysis

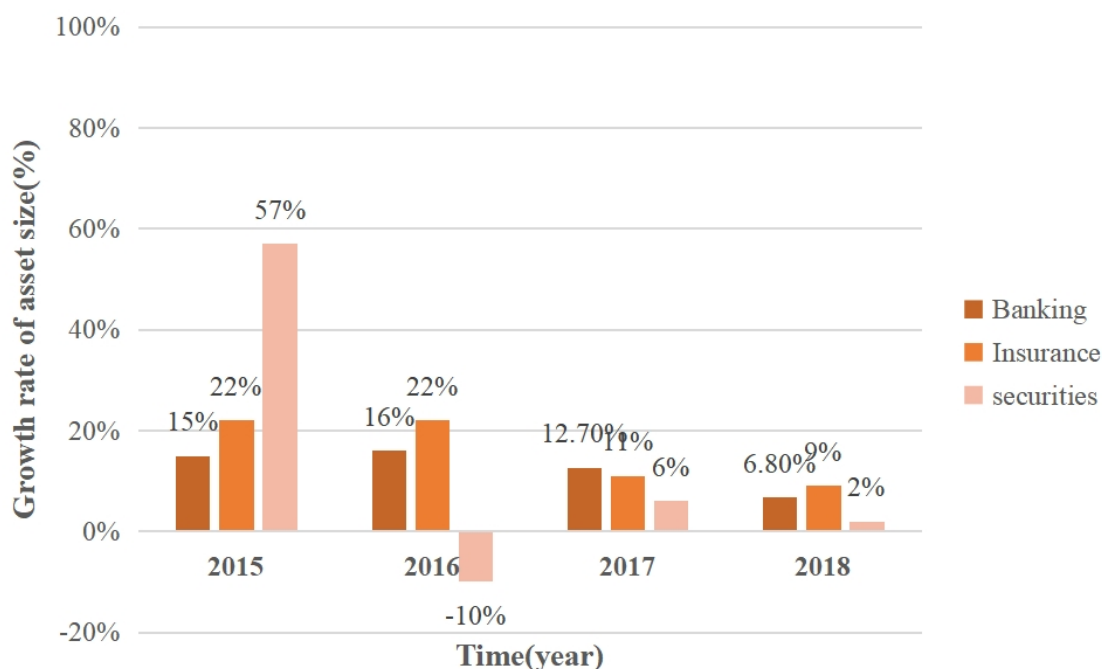


Fig. 2 Growth rate of total asset size of sub-sectors in financial industry (2015-2018). Source: Wind, CBIRC and AMAC

At the same time, due to the gradual improvement of the multi-level capital market and the gradual awakening of residents' awareness of asset allocation, insurance and securities industries have achieved decent growth potential. The total assets of the insurance industry at the end of 2018 soared to 18.3 trillion CNY, with 9.25% annual growth rate. The total assets of the securities industry at the

end of 2018 were 6.26 trillion yuan, increased by 0.12 trillion yuan from the end of 2017, up to 1.95% annually. And the total assets of the public fund industry at the end of 2018 were 13.0 trillion yuan, 1.4 trillion yuan more than that at the end of 2017, up to 12.07% year on year. In addition, the emergence of innovative forms such as Internet finance also promotes the further transformation and development of the financial industry.

According to preliminary statistics from the People’s Bank of China (PBC), the total assets of financial institutions reached 381.95 trillion yuan at end-2021, increasing 8.1 percent year on year. Specifically, the assets of banking institutions registered 344.76 trillion yuan, increasing 7.8 percent year on year; those of securities institutions reached 12.3 trillion yuan, growing 21.2 percent year on year; those of insurance institutions reached 24.89 trillion yuan, growing 6.8 percent year on year.

As it can be seen from Table 1, the total liabilities of financial institutions reached 346.58 trillion yuan, increasing 7.9 percent year on year. Specifically, the liabilities of banking institutions registered 315.28 trillion yuan, increasing 7.6 percent year on year; those of securities institutions reached 9.35 trillion yuan, increasing 24.4 percent year on year; those of insurance institutions reached 21.96 trillion yuan, growing 6.9 percent year on year.

According to the data of The Economist Intelligence Unit, the rapid growth of domestic resident income, middle and high income and high net worth (income) population will inject growth impetus into GDP (see figure 3) and the investment management industry (see figure 4). As the financial industry continues to develop rapidly, so will the number of financial employees, at least before the strike of COVID-19. Although compared with the annual growth rate of 7% since 2007, the growth rate of financial employees slowed to 4.45% in 2012 and 1.91% in 2013. However, under the stimulus of favorable policies and financial innovation, the growth rate rebounded rapidly from 2014 to 2016, reaching 9.26%. With the strengthening and adjustment of financial regulatory policies and market environment, the growth rate dropped slightly to 3.55% in 2017, and the total number of employees reached 6.888 million. Although the total employment still increased slightly in 2020, but as it can be seen in figure 5, with the onset of COVID-19 the growth rate of employment in financial industry plummeted to less than 5%, which is drastically lower than that in 2019. According to the National Bureau of Statistics, employed persons in urban units in the financial sector have been growing steadily during 2012-2020, although the increase was significantly reduced in 2020. But as indicated in figure 6, the number of employees in the insurance system reflects a significant downward trend under the epidemic's impact.

Table 1. The Balance Sheet of Financial Institutions at end-2021

	Outstanding value (trillion yuan)	Year-on-year growth (%)
Total assets	381.95	8.1
Banking institutions	344.76	7.8
Securities institutions	12.3	21.2
Insurance institutions	24.89	6.8
Total liabilities	346.58	7.9
Banking institutions	315.28	7.6
Securities institutions	9.35	24.4
Insurance institutions	21.96	6.9
Owners’ equity	35.37	10.5
Banking institutions	29.48	10.7
Securities institutions	2.95	12.2
Insurance institutions	2.93	6.5

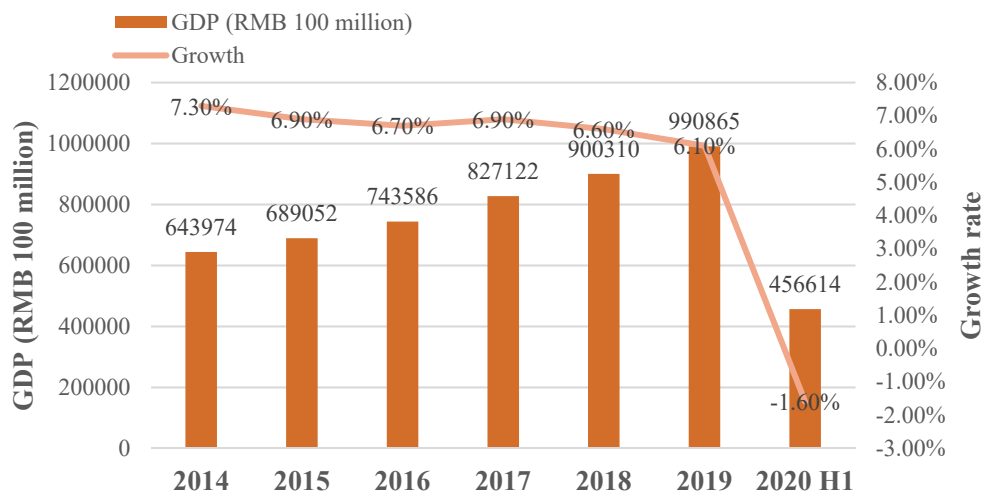


Fig. 3 GDP and growth rates

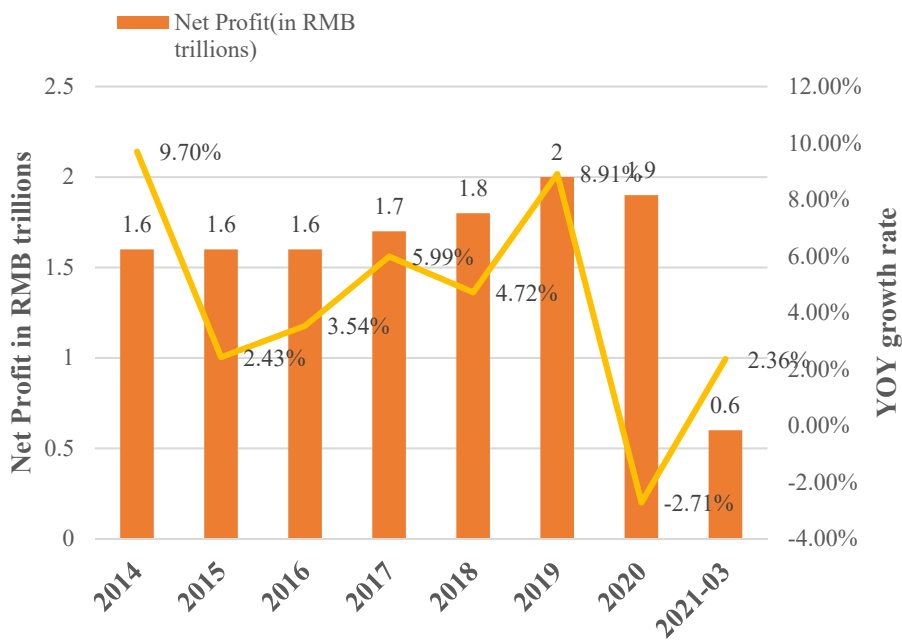


Fig. 4 Net profits and growth rates of China's commercial banks

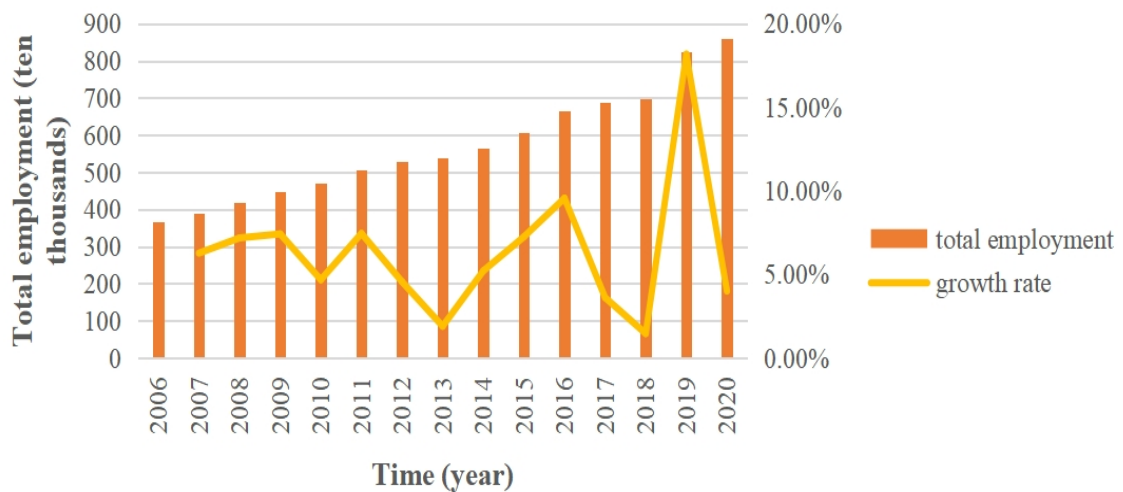


Fig. 5 Employment data in financial industry (2006-2020).

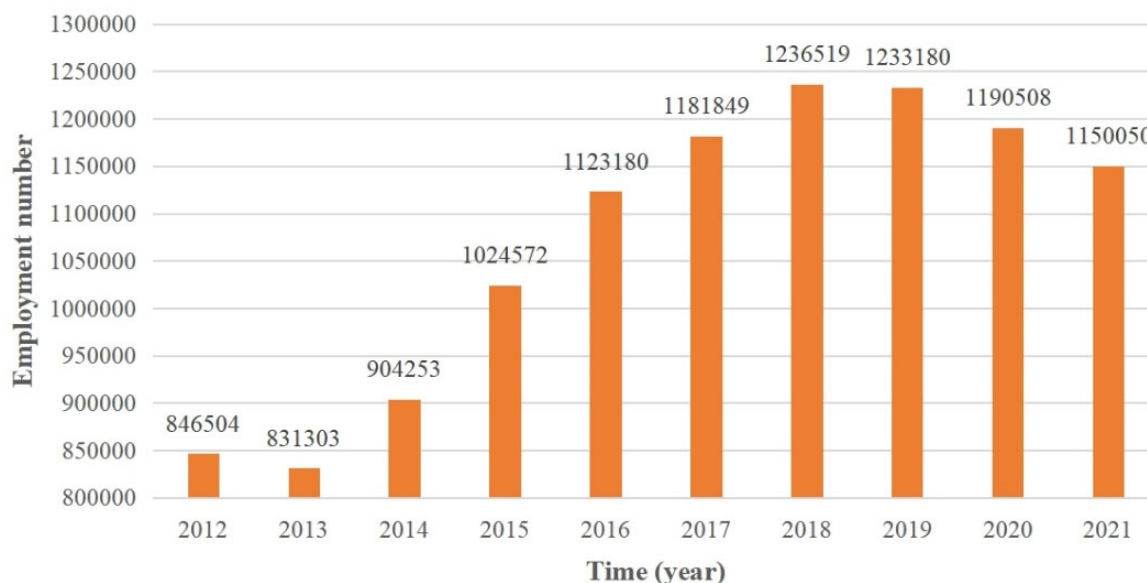


Fig. 6 Employment number in insurance industry between 2012-2021

To identify the impact of GDP growth and inflation on the employment of financial industry during COVID-19, this article resort to Phillips Curve and try to examine whether this classic model still stands in China under the pandemic. Phillips Curve is a curve showing the relationship between inflation and unemployment rate drawn by William Phillips, a statistician from New Zealand, in 1958 based on the general economic data of Britain from 1861 to 1957. This curve shows that inflation rate and unemployment rate follow an inverse relationship. When vigorous production and consumption activity overheat the economy, it would push up the overall price level and the demand for labour, which drives down the unemployment rate. The inverse is also true, as a lagging economy will trigger extensive decruitment and the price level would decline.

Put mathematically,

$$\pi_t - \pi_{t-1} = -\alpha(u_t - u_n) \quad (1)$$

π_t stands for inflation rate at time t , π_{t-1} stands for inflation rate at time $t-1$, α is a coefficient and u_t , u_n stand for unemployment rate at time t and natural unemployment rate respectively, the latter is a constant. So, to test whether inflation and unemployment manifest a linear relationship, the equation above is equivalent to

$$\pi_t - \pi_{t-1} = -\alpha u_t + \beta \quad (2)$$

$$\pi_t - \pi_{t-1} = \alpha^* EN_t + \gamma \quad (3)$$

In the above equations, α^* is another coefficient, β , γ are constants, and EN_t stands for employment number at time t .

The authors adopt inflation data from the National Bureau of Statistics, and collect total employment number of the six major state-owned commercial banks of China (CCB, ICBC, ABC, PSBC, BOCOM, BOC) as a indicator of the employment situation of banking sector in China. First of all, a Q-Q plot is drawn to verify whether the data set is normally distributed. And then a scatter plot and a fitting line of the inflation and employment data were formed, showing that the two variables show monotonicity distribution as a whole. Next, through operating analysis of correlation, this article examines the relationship between inflation and employment of the banking sector. Both Spearman test and Pearson test were adopted in this stage, reaching a conclusion that there is neither linear relationship nor significant correlation between the two data sets. Finally, a regression analysis is conducted in an effort to get R^2 and operate F-test.

3. Results and Discussion

The inflation rate data of China from 2017 to 2021 was found on the website of PBC and the NBS. As for bank employment number, in view of the difficulty in collecting all banks as there is no access to a statistic or research paper on it, this article takes an indirect approach. The employment number of the six major state-owned commercial banks of China (CCB, ICBC, ABC, PSBC, BOCOM, BOC) was collected respectively from their websites and various sources, and them added up to form the total employment number. Because the six major state-owned banks compose a huge share of China’s banking industry, their performance and employment number can be an indicator of the whole banking sector of China.

A Q-Q plot is drawn to examine the normality of the two data sets. If the two distributions being compared are similar, the quantile map is approximately on $y = x$. If the two distributions are linearly related, then the points on the quantile map would approximately follows a straight line.

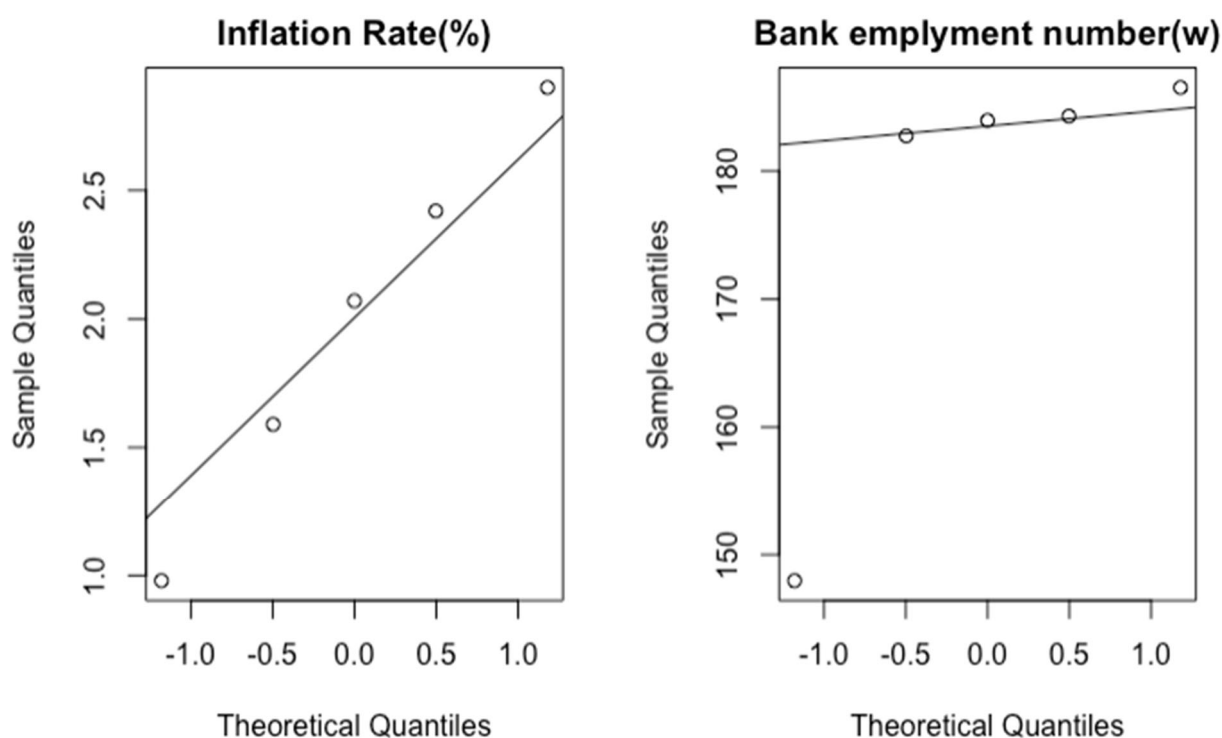


Fig. 7 Q-Q plot

QQ plots and normality tests give graphical representations of the normal distribution and hypothesis testing results. In the Q-Q plot, the scatter of the Inflation rate variable is more concentrated in the diagonal, suggesting that the variable may obey the normal distribution, while the scatter of the Bank employment variable deviates more from the diagonal, implying that the variable does not obey the normal distribution. From the results of the normality test, we can learn that the P-value of the normality test for the Inflation rate variable is >0.01 , suggesting that the normality requirement is satisfied, while the P-value of the normality test for the Bank employment variable is <0.01 , meaning that the normality requirement is not satisfied. In summary, the data do not obey the normal distribution.

And then to conduct monotonicity judgment, a fitted line of the inflation and employment data is drawn. The scatter distribution and fitted lines of the two variables in the figure show that the two variables follow a monotonic distribution overall.

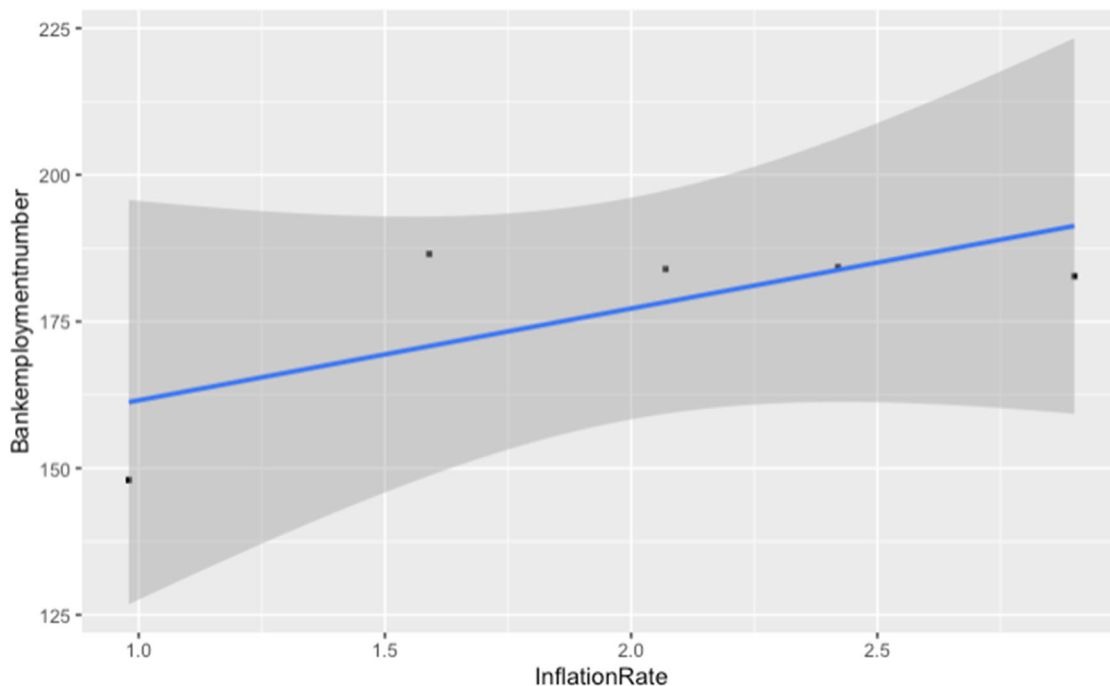


Fig. 8 Fitted line of the inflation and employment data

Next, correlation analysis is conducted. The first is the Spearman test, and the second is Pearson's correlation coefficient estimated. The first is Spearman's test, and the second is Pearson's correlation coefficient estimation. In statistics, Spearman and Spearman's ρ are the statistical dependence between the ranks of two variables. It also means that the Spearman test can use a function between these two variables to explain their relationship.

Pearson's correlation coefficient is a measure of the linear relationship between two sets of data. But Pearson correlation coefficient can only reflect the linear relationship between variables. The Pearson correlation coefficient cannot respond to many other types of relationships or correlations. Pearson correlation assesses a linear relationship, while Spearman correlation assesses a monotonic relationship. If there are no duplicate data values, a perfect Spearman correlation of +1 or -1 occurs when each variable is an ideal monotonic function of the other variable.

Table 2. Hypothesis test results

		Correlation
Inflation Rate	rh0	0.1
	Sig.	0.95
	N	5

The results of the analysis give the Spearman correlation coefficients of Inflation Rate and Bank Employment Number and the p-values of the hypothesis tests. Let hypothesis p_s is equal to 0, then the inflation rate is not related to bank employment number. After that let hypothesis p_s is not equal to 0, then inflation rate is related to bank employment number. As it can be observed from the result that Inflation Rate is not correlated with Bank Employment Number. Spearman Correlation coefficient $p_s=0.1$, $P>0.01$, H_1 is rejected and H_0 is accepted. There was no significant relationship between the two variables.

And then is the Pearson test. If the significance level is positioned at 0.001 in the normality test, from the results of the normality test, we can learn that the p-values of the normality test for Inflation Rate and Bank Employment Number variables are $P > 0.001$, suggesting that the normality requirement is satisfied. Thus, the Pearson test can be performed.

The results of the analysis give the Pearson correlation coefficient of Inflation Rate with Bank Layoff and the p-value of the hypothesis test. It is known that Inflation Rate is not correlated with Bank Employment Number, $P > 0.01$, and the original hypothesis is accepted, and the samples are not linearly correlated. And regression using R is performed. The results are shown as follows.

Table 3. Regression results

Model	Estimate		t	Sig
	B	Std.Error		
Constant	145.928	18.788	7.767	0.004
Inflation Rate	15.642	8.949	1.748	0.179
	<i>Adjusted R²</i>		0.34	
	F		3.056	
	P		0.179	

From the results of the regression analysis in the table above, it can be seen that the fit of the regression equation is adjusted R^2 is 0.34, It indicates that the fit of the regression equation is acceptable. However, the regression equation does not pass the F-test with a significance level of 0.01, $F = 3.056$, $p > 0.01$, indicating that the independent variable of the regression equation is not able to significantly affect the dependent variable.

The results of hypothesis testing and linear regression suggest that there is no linear correlation between inflation and banking recruitment during 2017-2021, and the classic Phillips Curve doesn't hold for banking sector in China in this period. This conclusion stays in line with Egan and Leddin, while their work focuses on data in China from 1987 to 2014, this article provide evidence from 2017 to 2021.

4. Conclusion

COVID-19 terminates the delicate growth trend of China's financial industry, adding more uncertainty to the future. Although China has taken strict methods to weep out COVID-19 and adopted easing policies to maintain financial stability, the negative impact of COVID on recruitment of the financial industry is significant. Therefore, COVID's detriment to the labor market is a long-term issue. While overall recruitment numbers have decreased, this downturn trend is forecasted to proceed in the following years. While the total graduation number constantly increases, this means more severe competition in the labor market. This paper finds out that the simple linear relationship between inflation and employment doesn't exist in the banking sector from 2017 to 2021. Besides, there is no significant relationship between inflation and the employment number, indicating that the classic Phillips Curve does not suit China's reality, both before and during the onset of COVID-19 in the banking sector. Due to lack of data this research only focuses on the banking sector and thus may be limited. Further researches ought to be implemented to investigate whether classic Phillips Curve still doesn't hold in other industries and for the overall economy of China.

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