Proceedings of the 2nd International Conference on Financial Technology and Business Analysis
DOI: 10.54254/2754-1169/65/20231650

The Impact of Inflation and Unemployment as Endogenous Variables on Economic Growth in China (2017---2023)

Yida Wang[1,a,*]

[1]*University of Southampton, SO17 3SX, Southampton, England*
a. yw31g22@soton.ac.uk
**corresponding author*

Abstract: Inflation and unemployment be investigated and determined by this article, through the performance of the Chinese economy over a specific time period, and the association between inflation and unemployment and real gross domestic products(GDP) also be discussed on this article.Granger test technique was employed and various diagnostic tests were conducted to determine the extent to which the data matches the analysis. For example, Whether the time series is smooth (ADF test), time leg, coordination test.Between 2017 and 2022, there will be a significant and positive association in China between the rates of job losses and inflation. There is just a modest negative link between the rate of hyperinflation and the expansion of the economy. The correlation between the rate of joblessness and growth in the economy is both negative and robust. This study was analyzed only covers the period of the years 2017 to 2022.This study is unique because of the regression analysis's conclusions and how the data were interpreted. In the research's conclusion, all relationships between price rises, joblessness, and economic expansion are discussed.

Keywords: Unemployment, inflation, economic growth

1. Introduction

L Jhingan argues that the procedure of the real income per person of a country increases throughtout the time is economic growth. The rise in the amount of commodities and amenities produced in a country is a sign of economic expansion. From a wider angle, this means raising people's standards of living and reducing income disparity. According to traditional economics, growth implies a rise in the rate of investment. Growth in the economy, as defined by Solow's growth model, is an increase in GDP as a result of population expansion, technical innovation, and investment [1].

In this segment of the examination, the empirical research on the correlation between economic and social literature concerning inflation, unemployment, and economic growth is showcased. Experts have examined the relationship between jobless and hyperinflation. William Philips reports in a study that he saw an inverse association between changes in wages and the unemployment rate [2]. The historical unemployment rate and the pace of economic growth have an inverse relationship known as the Philips curve. Both joblessness and inflation have an inverse connection. Change the word you use. The rate of unemployment decreases as inflation rises.

Adjustable foresight the curve of Phillips. O'affirm's law gave rise to Okun's law, which was put forth by Arthur M. Okun in 1962 [3]. There is empirical evidence linking a nation's production losses and its unemployment rate. A nation's GDP is about 2% less than its potential GDP for every 1%

DOI: 10.54254/2754-1169/65/20231650

increase in unemployment. Chang-Shuai Li and ZI Juan Liu looked studied the connection between China's joblessness and economic expansion [4]. Unit root cointegration, VAR, VEC, and Granger causality tests were employed. The study finds that while jobless has an adverse impact on economic expansion, inflation has a favorable one.

1.1. The Definition of Unemployment

Typically, classical economists define unemployment as too much of workers. A surplus of workers leading from real wage adjustments. Normal unemployment or real wage attrition are while the truel wage for a work is set above the level at which the market clears, as measured by the amount of job openings. As the International Labour Organization mentioned, unemployment is a state of do not have job that occurs when people do not have jobs and have positively looking for employment for four weeks. The unemployment rate quantifies the incidence of unemployment [5]. Dividing the amount of unemployed people by the amount of unemployed people multiplied by the proportion of unemployed individuals is the way to calculate the rate of unemployment. As to Jhingan's statement, jobless can be characterised as the percentage of the labor force that is inactive [6]. Additionally, happy and get ability workers also be defined as unemployment.

1.2. The Definition of Inflation

As per Balami's definition, inflation is the overall increase in prices for different goods and services over a prolonged duration, as well as the overall rise in prices for services [7]. The general price level's percentage increase rate during a certain time period is used to measure inflation. It is best described as a mostly monetary phenomenon, according to University of Chicago neoclassicals and their adherents. "Inflation has always been a monetary phenomenon and is pervasive," claims Friedman M. Around the world, inflation is a phenomenon related to money that only arises when the amount of money increases more quickly than output [8]. Johnson defines inflation as a continuous increase in the price of items and amenities, while Hicks defines it as a continuous rise in the level of prices generally.

According to Brumann, inflation is defined as a persistent rise in the level of prices overall. Dernburg and McDougall were more transparent when writing [9]. "The term 'inflation' typically refers to a sustained increase in prices, as measured by indices such as the Consumer Price Index (CPI)" or by the implied price deflator of the gross domestic product, according to what they wrote. The growing aggregate demand was emphasized by Keynes and his adherents as the cause of demand-pull inflation [10].

1.3. The Definition of Economic Growth

In this segment of the examination, the empirical research on the correlation between economic and social literature concerning inflation, unemployment, and economic growth is showcased. Experts have examined the relationship between jobless and hyperinflation. William Philips reports in a study that he saw an inverse association between changes in wages and the unemployment rate [2]. The historical unemployment rate and the pace of economic growth have an inverse relationship known as the Philips curve. Both joblessness and inflation have an inverse connection. Change the word you use. The rate of unemployment decreases as inflation rises.

Adjustable foresight the curve of Phillips. O'affirm's law gave rise to Okun's law, which was put forth by Arthur M. Okun in 1962 [3]. There is empirical evidence linking a nation's production losses and its unemployment rate. A nation's GDP is about 2% less than its potential GDP for every 1% increase in unemployment.

DOI: 10.54254/2754-1169/65/20231650

Chang-Shuai Li and ZI Juan Liu looked studied the connection between China's joblessness and economic expansion [4]. Unit root cointegration, VAR, VEC, and Granger causality tests were employed. The study finds that while jobless has an adverse impact on economic expansion, inflation has a favorable one.

2. Data Analysis

2.1. Data Source and Variable Selection

This paper is based on the existing literature, with full reference to the research and analysis of domestic and foreign research scholars on the inflation rate and unemployment rate on GDP growth, and comines the past research results to construct an empirical analysis model. China's GDP growth rate as the core explanatory variable, consumer price growth rate, unemployment rate as explanatory variables to construct the regression model.

The time span of this study is from 2017 to the fourth quarter of 2022, covering nearly 6 years. Rend, Such a time span not only helps us capture the long-term economic trend, but also provides us with enough data points to make the empirical analysis results more robust. All data are sourced from the National Bureau of Statistics of China, which can ensure the accuracy and reliability of the data.

2.2. Model Design

This paper proposes to establish a VAR (Vector Autoregressive Model) with China's GDP growth rate as the core explanatory variable, and consumer price growth rate(inflation rate) and unemployment rate as the explanatory variable see equation (1).

$$\text{gdp\_growth}_t = \varphi_{11} * \text{gdp}_{\text{growth}_{t-1}} + \beta_{11} * \text{inflation}_{\text{rate}_{t-1}} + \alpha_{11} * \text{unemployment}_{\text{rate}_{t-1}} + \varphi_{12} * \text{gdp}_{\text{growth}_{t-2}} + \beta_{12} * \text{inflation}_{\text{rate}_{t-2}} + \alpha_{12} * \text{unemployment}_{\text{rate}_{t-2}} + \cdots + \varphi_{1p} * \text{gdp}_{\text{growth}_{t-p}} + \mu_1 \quad (1)$$

2.3. Descriptive Statistics

Firstly, the GDP of China has a minimum of -0.259, a maximum of 0.210, a mean of 0.027, and a standard deviation of 0.124, according to this article. From these statistics, we can see that GDP growth rate of China experienced fluctuation during the period under study, but in general showed a relatively stable trend. Its standard deviation of 0.124 reflects the volatility of the growth rate, but the fluctuation is small compared to its mean value of 0.027. This suggests that China's economy has experienced short-term fluctuations over the period studied, but in the long run, economic growth has been relatively stable.

In addition, this study notes that the inflation rate has a mean of 1.955, a standard deviation of 1.169, a minimum value of -0.200, and a maximum value of 5.200. from these statistics, we can see that the inflation rate experienced fluctuations during the period under study, but generally showed an upward trend.

Its standard deviation of 1.169 reflects the volatility of the inflation rate, but the fluctuations are managebale relative to its mean value of 1.955. This shows that inflation has maintained a relatively stable level in the long run despite short-term fluctuations during the period under study.

In conclusion, this study notes that the unemployment rate ranges from 4.833 at least to 5.867 at maximum, with a mean of 5.240 and a standard deviation of 0.312. These figures show that, with a few minor variations, the unemployment rate has been largely constant during the research period. The standard deviation of 0.312 reflects the volatility of the unemployment rate, but the fluctuation

DOI: 10.54254/2754-1169/65/20231650

is very limited in relation to its mean value of 5.240. This shows that the unemployment rate has maintained a relatively stable level over the period studied, indicating the stability of the labour market (Table 1).

Table 1: descriptive analysis

VarName	Obs	Min	Median	Mean	Max	SD
inflation_rate	24	-0.200	1.917	1.955	5.200	1.169
unemployment_rate	24	4.833	5.167	5.240	5.867	0.312
gdp_growth	24	-0.259	0.073	0.027	0.210	0.124

3. Correlation Analysis

Before conducting the empirical analysis, it is crucial to explore the correlation between the variables as it helps us to understand the degree of association between the variables and the possible problem of multicollinearity. Table3-2 demonstrates the results of the correlation analysis between the main variables in this study. his paper finds that unemployment and inflation are growing in tandem and are significantly correlated, suggesting that China may be in a period of stagflation at this stage which might because of covid-19. There is no serious multicollinearity between the other variables (Table 2).

Table 2: correlation matrix

	inflation_rate	unemployment_rate	gdp_growth
inflation_rate	1		
unemployment_rate	0.442**	1	
gdp_growth	-0.013	-0.268	1

*** p<0.01, ** p<0.05, * p<0.1

3.1. Smoothness test

In this study, information from time series are subjected to a unit root test. The test's main goal is to normalize the time series data in order to stop the data results from pseudo-regressing. At a significance level of 5% for the original data, Table 3 shows that the gdp growth rate refutes the original hypothesis that a unit root exists, but the other two variables become smooth variables after taking the difference.

Table 3: Smoothness test

	Test statistic	1% critical value	1% critical value	1% critical value	P value	
inflation_rate	-1.891	-3.750	-3.000	-2.630	0.3365	Not steady
unemployment_rate	-2.445	-3.750	-3.000	-2.630	0.1295	Not steady
gdp_growth	-9.142	-3.750	-3.000	-2.630	0.0000	Steady
dinflation_rate	-4.423	-3.750	-3.000	-2.630	0.0003	Steady
dunemployment_rate	-5.923	-3.750	-3.000	-2.630	0.0000	Steady

DOI: 10.54254/2754-1169/65/20231650

3.2. Information Criterion

For the VAR model to effectively depict the connection between factors, it is imperative that the appropriate order of lags be determined using the Akaike Information Criterion (AIC) and that the association among factors be found to be easy using the cointegration test before defining the mode. This makes it possible for the VAR model to account for most variable interactions. The optimal lag order, according to the information criterion in the table below, is second order for the SC test, but it is determined to be fourth order by the AIC and FPE criteria. For this reason, three lag periods are chosen for the cointegration and VAR tests in this paper (Table 4).

Table 4: Information guidelines

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-11.7387				.000817	1.43607	1.43607	1.5529
1	-3.22612	17.025	9	0.048	.000868	1.45011	1.57964	2.04698
2	-.969025	4.5142	9	0.874	.001761	2.09229	2.31898	3.13681
3	35.3219	72.582	9	0.000	.000155	-.50685	-.18301	.985325
4	55.698	40.752*	9	0.000	-1.59029*	19.6912	-1.16929*	.349541*

4. Conclusion

This paper finds that unemployment and inflation are growing in simultaneously and are significantly correlated. Which overthrowing the result of some scholars cause they mentioned that unemployment does not Granger cause inflation. This paper also finds inflation and economic growth are not correlated, which is same as the result of some scholars. This paper finds unemployment and economic growth are growthing in simultaneously, this also overthrowing the theory, because they mentioned that unemployment does not Granger cause economic growth. The reason why this article can disprove a lot of previous ideas is because the years are different, they discuss 1978 to 2010 this article discusses 2017 to 2022 For example, Covid 19 that started in 2020 which caused the economy to stagnate. Two suggestion are made, Increase the employment rate, optimize labor resources, and broaden employment chan. Economic restructuring should be further promoted. Promote the sustained and healthy development of China's economy.

References

[1] *Solow, B., & Sandham, A. (2002). Cranio-cervical posture: a factor in the development and function of the dentofacial structures. The European Journal of Orthodontics, 24(5), 447-456.*

[2] *Phillips, A.W.(1958). The Relationship between Unemployment and Rate of Change in Money Wage Rates in the United Kingdom, Economica, 25.*

[3] *Okun, A.(1962).Potential GNP & Its Measurement and Significance, American Statistical Association, Proceeding of the Business and Economics Statistics.*

[4] *Chang-shuai, L. and L. Zi-juan(2012) Study on the relationship among Chinese unemployment rate, Economic growth and Inflation. Advances in Applied Economics and Finance, 1, 1, World science Publishers, United states*

[5] *ILO (2009). International Labour Organization,Labour Statistics Yearbook,Geneva.*

[6] *Jhingan, E., Devlin, R. H., & Iwama, G. K. (2003). Disease resistance, stress response and effects of triploidy in growth hormone transgenic coho salmon. Journal of Fish Biology, 63(3), 806-823.*

[7] *Balami, D.H.(2006). Macroeconomic Theory and Practice, Salawe prints, Off Leventies, Wulari, Maiduguri.*

[8] *Friedman, M.(1976). Intflation and Unemployment_Nobel Menorial Lecture, The University of Chicago,Illinois,USA*

[9] *Dernburg, T. F., & McDougall, D. M. (1919). Macro-economics: the measurement, analysis, and control of aggregate economic activity. -.*

DOI: 10.54254/2754-1169/65/20231650

[10] Keynes, J. M., Moggridge, D. E., & Johnson, E. S. (1971). The Collected Writings of John Maynard Keynes (Vol. 30, pp. 1971-89). London: Macmillan.