Generating Mechanism of the Income Gap -- the Perspective of Private Investment and Economic Growth

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Abstract
We constructed a vector auto-regression model (VAR) and empirically studied the relationships among private investment, economic growth and the income gap using time-series data for the period between 1995 and 2012. Empirical results show that Private investment, economic growth and income disparity have a long-term equilibrium relationship. Private investment growth is conducive to narrowing the income gap and has a long-term influence on the income gap. Economic growth also has a positive impact on the income gap. By contrast, income gap expansion also plays a certain role in economic growth. The income gap and private investment are the Granger Causes of economic growth, whereas income inequality is the Granger Cause of private investment. This research may be helpful for the government to promote diversification in sources of investment, encourage changes in the economic growth mode, and narrow the income gap.
Key words: PRIVATE INVESTMENT, AUTO-REGRESSION MODEL, ECONOMIC GROWTH, INCOME DISPARITY

1. Introduction

In recent years, the Chinese economy has achieved tremendous development and the population's living standards have been improving consistently. Although the economy has maintained this momentum for rapid development, issues such as a widening income gap among residents and income inequality are becoming increasingly severe. In recent years, the income gap among Chinese residents has shown an increasing trend. As an important force in bolstering economic growth, private investment has profound underlying mechanisms that interact with the income gap. The causes of the income gap have attracted extensive attention from academia.

The relationship between economic growth and income disparity has always been a focus of studies in economics and the social sciences. In this regard, there are four distinct points of view. The first is that the relationship between economic growth and income disparity takes the shape of a "U" curve. Kuznets proposed the notion of the "U"-shaped relationship between economic growth and income distribution, which states that as the economy grows, the gap in

income distribution first expands and then contracts [1]. Liao Liao, X. L., Wang, L. Y. and Chen, N. explored the influence of income disparity on economic growth using panel data for 7 representative transformation economies between 1986 and 2009. The results show that the relationship between income disparity and economic growth takes the shape of an inverted "U" curve in transformation economies [2]. Han, Y. B. Also shows that income distribution and economic growth display a long-term equilibrium relationship. Under conditions of economic development, income distribution takes the shape of an inverted "U" curve. The second point of view is that there is a positive relationship between economic growth and income disparity [3]. Forbes discovered that income disparity has positive effects on economic growth in both the short and medium terms. Using the dynamic Generalized Methods of Movements (GMM)[4], Murphy et al. proposed the "Big Push" theory of income distribution, which holds that income disparity influences economic growth through market size and that the polarization of income distribution can hinder economic growth[5]. Persson and Tabellini examined multinational cross-section data and showed that income inequality may hamper economic growth. Similarly [6], Panizza also found that income disparity can have a negative effect on economic growth [7]. Chao et al. explored the relationship between income inequality and economic growth from the perspective of effective demand, showing that income inequality hinders economic growth via effective demand and can have a very significant effect in the short term [8]. Finally, some scholars posit that there is an uncertain relationship between economic growth and income disparity. Alesina and Rodrik[9] assumed that an increased income gap would prompt more people to support tax increases to enhance income redistribution. However, high taxes would hinder investment, which would subsequently affect economic growth. Han, J. Y. [10] used a panel co-integration model to investigate the long-term equilibrium between the income gap among Chinese residents and economic growth. This research found that the income gap generally has a positive influence on economic growth. However, starting in 2001, income inequality has hindered economic growth and this negative influence is increasing each year.

Scholars have also explored the relationship between investment and income disparity in great depth. However, they have focused on the impact of foreign direct investment (FDI) on income inequality. Using provincial panel data, Wan, G. H., Lu, M. and Chen, Z. investigated the impact of globalization on regional income disparity and concluded that FDI and trade variables play a major role in influencing regional income disparity [11]. Wang, S. J. [12] also reached a similar conclusion. However, Dai, F. [13] used provincial panel data from 1997 to 2006 to study the influence of FDI on regional income disparity and urban-rural income disparity in China, showing that FDI may significantly increase the urban-rural income gap within provinces while decreasing the wage gap between provinces. He, Z., Qin, D. H. found that there is a nonlinear relationship between FDI and income inequality [14]. Government investment refers to the activities carried out by the government. As a special investor, the government uses fiscal spending to invest in particular departments. The interplay between government investment and economic growth is also a focus of academic research. Using data from the period between 1980 and 2005 and an error-correction model, Liu, Z. M, Ma, S. C. and Chen, S. Q analyzed the short- and long-term effects of Chinese government expenditures, public investments and individual items of government spending on private investment, showing that government investment crowds out private investment, whereas public investment crowds in private investment[15].

Li used Chinese panel data from 1995 to 2008 to construct a dynamic panel data model and investigated the effects of local public investment on regional economic growth, indicating that public investment by local governments has promoted regional economic growth since 1995[16]. Utilizing yearly data for 11 provinces in eastern China and the Pooled Mean Group (PMG) method, Chen W [17] also found support for this point of view.

With regard to issues related to investment, economic growth and income disparity, scholars have mostly emphasized relationships between economic growth and income disparity, investment and economic growth, and investment and income disparity. With regard to investment-related issues, the research has focused on the effects of government investment on economic growth. As is widely known, China has implemented a reform and opening-up policy that allows private investment to be allocated toward social resources. As an important investment mode, private investment plays an important role in increasing employment and promoting economic growth. According to a report from the National Bureau of Statistics of the People's Republic of China, private

investment accounted for approximately 74.3% of total investment nationwide until 2012. Therefore, explorations into the relationships among private investment, economic growth and income disparity are of important theoretical and practical significance to promoting healthy economic and societal development in China nowadays. Presently, the related literature still provides insufficient coverage of the relationship between private investment and economic growth or that between private investment and income inequality.

This article adopts the method of empirical study, building a vector autoregressive model (VAR) by using the time series data from 1995 to 2012. Based on other income inequality research, this paper has innovatively introduced the variable of private investment to explore the mechanism of action among private investment, economic growth and income disparity, which represents a new approach in the study of the causes of income inequality. We use the methods of unit root test, co-integration test, granger causality test, and impulse response function and variance decomposition, in order to find the reasons of income disparity from the perspective of private investment and economic growth. It is of great significance for government to improve private investment, narrow the income gap, perfect social distribution system and promote the healthy development of the economy. The conclusion of this paper is a beneficial exploration to seek the cause of the residents' income inequality in developing countries.

2. Research Methods and Data Explanation

2.1. Research methods

This paper constructed a dynamic model for private investment, economic growth and the income gap among residents by using the VAR method. The unit root test, the co-integration test, the Granger causality test, the impulse response function and variance decomposition were used to study the interplay among the three examined factors.

(1) Private investment: This occurs when an owner of private capital invests his capital in the production and circulation domains. In addition, private investment also refers to the investment of private capital from one country into another country to start companies or enterprises to engage in business operations. This paper used the method of Chen (2014)[17], employing total investment in fixed assets minus state-owned investment as the indicator used to measure private investment.

(2) Economic growth: In the available empirical studies, most scholars have used gross domestic product (GDP) or GDP per capita to measure economic growth [18] [19]. However, GDP cannot accurately represent the actual circumstances of individuals or indicate the levels of social and economic inequality, whereas GDP per capita directly and effectively reflects the influence of economic development on the population [20]. Therefore, this paper adopted GDP per capita as an indicator of economic growth.

(3) Income gap: This paper adopted the Gini coefficient—an authoritative indicator that is internationally recognised and widely adopted—to measure the gap between the rich and the poor to demonstrate income inequality among residents. This indicator is a measure of statistical dispersion intended to represent the income distribution of a nation's residents and is the most commonly used measure of inequality. It is indicative of wealth disparity and can objectively and intuitively reflect the wealth gap among residents 1[21].

To facilitate calculation, this study used the Gini coefficient multiplied by 100 as a measure of the income disparity among residents. On the premise that the economic significance of the examined variables, logarithmic processing was conducted on variable data to eliminate the influence of heteroscedasticity in the time series. The three examined variables—private investment, economic growth and income disparity— were, respectively referred to as LNPI, LNGDP and LNGN. The consumer price index, with 1995 as the base year, was used to adjust private investment and GDP per capita to eliminate price-influencing factors.

2. 2. Data explanation

The sample range in this paper was selected from the years between 1995 and 2002, and GDP per capita; private investment, Gini coefficients and other basic data were all taken from the China Statistical Yearbook and the China Compendium of Statistics 1949-2004. Gini coefficients came from the national Gini coefficient data calculated by Tian (2012), who used the relation between the Lorenz curve and the Gini coefficient to first infer the formulae used to calculate the Gini coefficient, then calculated the Gini coefficients of urban and rural residents, and finally applied the modified urban-rural weighting method to calculate the Gini coefficients of the income of national residents.

Figures 1, 2 and 3 show that since 1995, private investment and GDP per capita have risen consistently, with growth rates increasing each

year. The Gini coefficient increased for 7 years in a row starting in 1997, and then decreased modestly after reaching 0.4361 in 2003. It was generally stable after reaching a maximum of 0.4385 in 2007 and did not begin to decline again until 2010. The Gini coefficient was proposed by the Italian economist Gini in 1922 to quantitatively measure differences in distribution and can theoretically range from 0 to 1. The closer it is to 0, the more equal the distribution is. The closer it is to 1, the more the distribution tends towards inequality. According to the general international standards, a Gini coefficient with a value above 0.4 indicates a rather large income gap, and when the value is above 0.6, the income gap is very large. From the data shown above, it can be seen that China's Gini coefficients have remained close to 0.4 for more than a decade, exceeding 0.4 in most years; this indicates a wide income gap that should not be ignored.

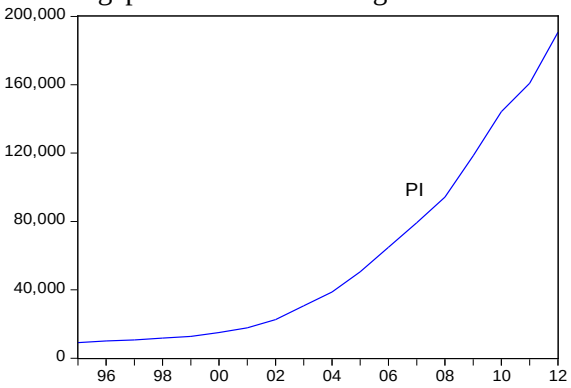

Figure 1. Changes in private investment in China since 1995 after removing price-influencing factors

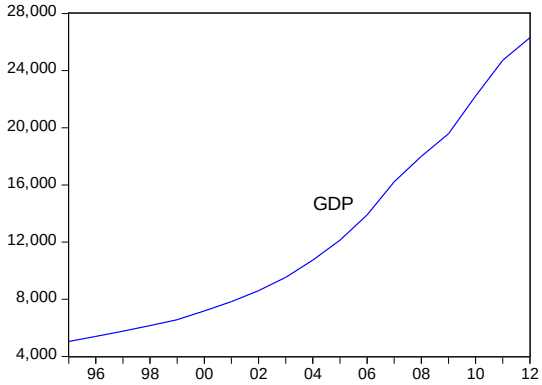

Figure 2. Changes in Chinese GDP per capita since 1995 after removing price-influencing factors

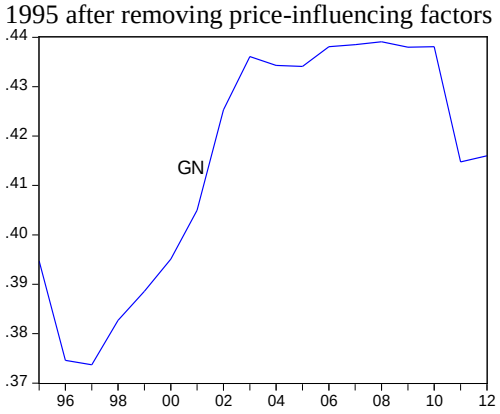

Figure. 3. Changes in China's Gini coefficient since 1995

3. Empirical Analysis

3.1. Unit root test of the time-series

In the case of many economic indicators, time-series data do not have stable time-series characteristics because they always exhibit some type of tendency. For economic time-series data with an increasing tendency, it is not possible to determine whether the data have a stable process with trend terms or a unit root process with constant terms from only a graphical representation. To avoid the appearance of the "pseudo-regression" phenomenon in the process of establishing the vector auto-regression model, it is necessary to conduct the stationary test. The standard method used to test series stationary is the unit root test [22]. This paper adopted the augmented Dickey-Fuller (ADF) method to carry out the unit root test for the variables. The results are shown in Table 1.

Table 1. Results of ADF unit root test

Variable	Test form (C,T, L)	Test value (t)	Critical value	Conclusio
LNPI	(C, 0, 3)	-0.262969	-2.673459*	Unstable
LNGDP	(C, T, 3)	-3.229047	-3.342253*	Unstable
LNGN	(C, 0, 2)	-1.029316	-2.666593*	Unstable
∆LNPI	(C, 0, 2)	-1.550792	-3.310349*	Unstable
∆LNGDP	(C, 0, 1)	-1.071789	-3.310349*	Unstable

ΔLNGN	(C, 0, 3)	-3.447724	-3.920350***	Unstable
Δ^2LNPI	(C, T, 3)	-3.501465	-3.342253*	Stationary
Δ^2LNGDP	(C, T, 3)	-5.189988	-4.800080***	Stationary
Δ^2LNGN	(C, T, 3)	-4.071954	-3.759743**	Stationary

Notes: LNPI indicates private investment; LNGDP indicates economic growth; LNGN indicates income disparity; Δ LNPI indicates the first difference in LNPI. Δ^2 LNPI indicates the second difference in LNPI. The remaining indicators follow the same pattern. (C, T, L) indicate the form of the test, where C means constant terms contained, T means trend terms contained, and L indicates lagged order.*, ** and *** represent significance levels of 10%, 5% and 1%, respectively.

In Table 1, LNPI, LNGDP and LNGN and their first differences all have unit roots and are therefore not stable time-series. This table also shows the second differences of LNPI, LNGDP and LNGN, which are Δ^2LNPI, Δ^2LNGDP and Δ^2LNGN, respectively. These were all changed into stationary time-series and are integrations of the same order, referred to as I (2)

3.2. Co-integration test and establishment of the VAR mode

The co-integration test can be used to determine whether there is a long-term stable relationship between variables [23]. According to the results of the unit root test, LNPI, LNGDP and LNGN were all integrations of the second order, thus meeting the conditions for a co-integration test. This study employed the Johansen co-integration test method, which can accurately identify the number of co-integrated vectors when the multivariate co-integration test is carried out. Before carrying out the Johansen co-integration test, the optimal lag of the VAR model should be determined. Lag length criteria were used to determine the VAR model's optimal lag phase; the results are shown in Table 2.

Table 2. Optimal lag of VAR model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	43.70703	NA	0.0000	-5.427605	-5.285995	-5.429113
1	120.4087	112.4958*	0.0000*	-14.45449	-13.88805*	-14.46053
2	127.061	7.095796	0.0000	-14.14147	-13.1502	-14.15203
3	141.0335	9.314982	0.0000	-14.80446*	-13.38836	-14.81955*

Note: * indicates the optimal lag at a significance level of 5%

Table 2 shows the five evaluation criteria of LR, FPE, AIC, SC and HQ and their respective optimal lags. Among these, the LR, FPE and SC criteria all indicated that the model's optimal lag was of the first degree. Therefore, the first order was selected as the optimal lag to carry out the Johansen co-integration test; the results are shown in Table 3.

Table 3. Results of Johansen co-integration test

Number of co-integrated vectors	Eigenvalue trace test		Max-eigenvalue test	
	Trace statistics	5% critical	Max-Eigenvalue	5% critical
0 *	45.79805	42.91525	27.69454	25.82321
At most 1	18.1035	25.87211	12.59444	19.38704
At most 2	5.509068	12.51798	5.509068	12.51798

Note: * the null hypothesis was rejected at a significance level of 5%.

Table 3 indicates that the trace and max-eigenvalue tests rejected the original hypothesis that no co-integration equation worked but accepted the hypothesis that at least one co-integration equation existed. Therefore, co-integration equations were found for LNPI, LNGDP and LNGN (the three time-series variables) at a significance level of 5%, indicating

that private investment, economic growth and income disparity had long-term equilibrium relationships with each other.

As previously mentioned LNPI, LNGDP and LNGN were all second integrated series and satisfied the co-integration relation. Therefore, they could be regarded as endogenous variables of the system. Further, each endogenous variable could be regarded as a function with its lag value. VAR model (1) was established using the vector auto-regression method based on multivariate co-integration.

$$\begin{pmatrix} LNGDP_{(t)} \\ LNGN_{(t)} \\ LNPI_{(t)} \end{pmatrix} = C + A \begin{pmatrix} LNGDP_{(t-1)} \\ LNGN_{(t-1)} \\ LNPI_{(t-1)} \end{pmatrix} + \varepsilon, t = 1,2,...18 \quad (1)$$

In this model, C is a3-dimensional column vector, A is a 3x3 coefficient matrix to be estimated, and ε is a 3-dimensional disturbance vector. They could be in a mutual contemporaneous correlation, but were not correlated with their own lag values or with the variables on the right side of the equation. Eviews 6.0 was used to derive the following estimation equation for VAR model (1):

$$\begin{pmatrix} LNGDP_{(t)} \\ LNGN_{(t)} \\ LNPI_{(t)} \end{pmatrix} = \begin{pmatrix} -0.743999 \\ -2.066170 \\ -8.925053 \end{pmatrix} + \begin{pmatrix} 0.822463 & 0.435064 & 0.082787 \\ 0.396719 & 1.191881 & -0.222016 \\ 0.779119 & 1.825452 & 0.530007 \end{pmatrix} \begin{pmatrix} LNGDP_{(t-1)} \\ LNGN_{(t-1)} \\ LNPI_{(t-1)} \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{pmatrix} \quad (2)$$

3.3 Analysis of impulse response function

The VAR model is characterised by a systematic dynamic, meaning that a change or impact in any endogenous variable influences that variable itself as well as all the other endogenous variables. The impulse response function describes the responses of the endogenous variables to the size of the change. Specifically, it describes the influence of the application of one standard deviation to an error term on the present and future values of an endogenous variable.

The impulse response analysis is carried out to ensure that the established VAR model is stable and can carry out the stability test for VAR model (1). The results showed that the reciprocals of the AR root modulus of the VAR model were all within the unit circle (Fig. 4), indicating that VAR model (1) was stable.

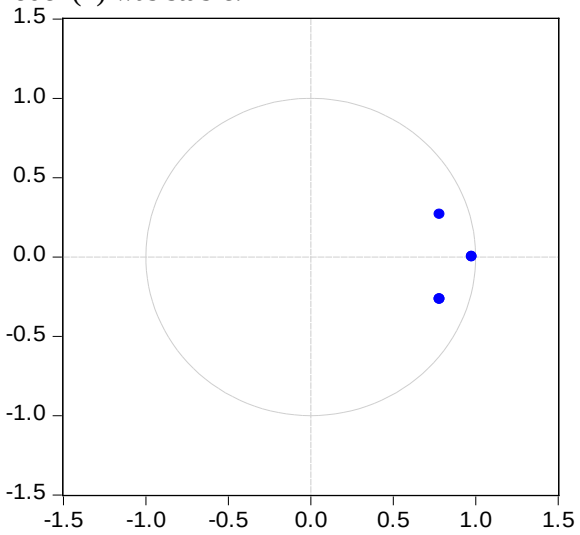

Figure 4. AR root diagram

The impulse response function was charted onto an impulse response curve, thus allowing the dynamic influence of the impact of each endogenous variable to be analysed intuitively. Changes of one standard deviation were made to LNPI, LNGDP and LNGN during their respective current phases. The impulse response curves of LNPI, LNGDP and LNGN are shown in the figure below. The vertical axis represents the amount of lag of the impact function (in years) and the horizontal axis shows the value of the impulse response function.

Figure 5 shows how private investment responds to changes of one standard deviation in economic growth, income disparity, and private investment itself. It can be observed from the figure that the impact of a positive change of one standard deviation in economic growth and income disparity" conveys the intended meaning could have a positive impact on private investment. The impact of economic growth reached a maximum value of 0.144 in the eighth lag phase and then gradually decreased. The impact of income disparity reached a maximum value of 0.077 in the fifth lag phase and then gradually declined over time. The change in private investment had a negative impact on private investment itself; it gradually declined, flattening out after the eighth and ninth phases.

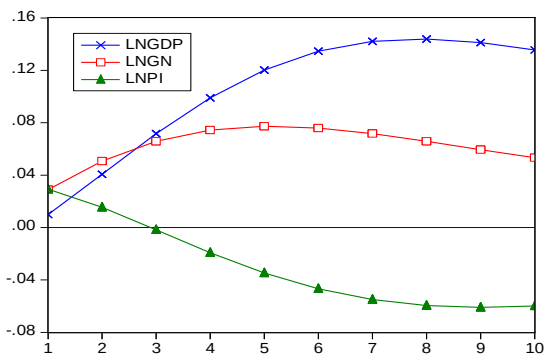

Figure 5. Response of private investment to changes in three variables

Figure 6 shows the respective responses of economic growth to a change of one standard deviation in private investment, income disparity and economic growth itselff. Positive changes in unit standard deviations of income disparity and private investment itself could have a positive effect on economic growth, in which the effect of the private investment was more noticeable. It began to grow starting in the first lag phase and flattened out in the ninth phase. The impact of income inequality began to increase gradually in the first lag phase and then started declining slowly after reaching a maximum value of 0.037 in the seventh lag phase. Although private investment had a somewhat positive impact on economic growth in the initial stage, it began to decline gradually starting in the second lag phase.

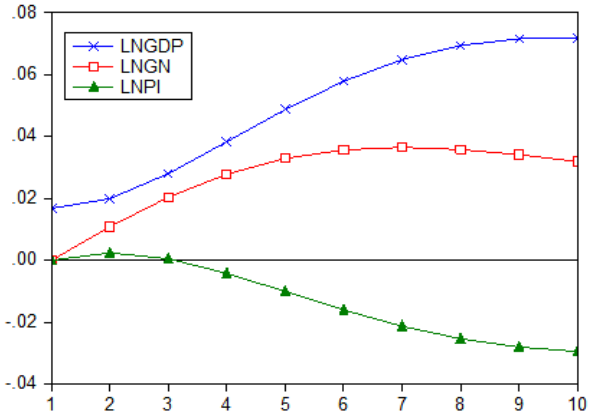

Figure 6. Response of economic growth to the impact of three variables

Figure 7 shows the respective responses of income disparity to changes of one standard deviation in economic growth, private investment and income disparity itself. The impact of the change in income disparity on itself became most prominent after the first lag phase and declined gradually over time, reaching a minimum value of -0.003 in the tenth lag phase. The impact of economic growth was also rather prominent in the first phase and then began to increase gradually until reaching a maximum value of 0.021 in the third phase. It then declined steadily and flattened out in the ninth lag phase. The impact of private investment had a negative impact on income disparity. The negative influence in the first four phases increased gradually until reaching a minimum value of -0.012 in the fourth lag phase, after which it slowly started to increase.

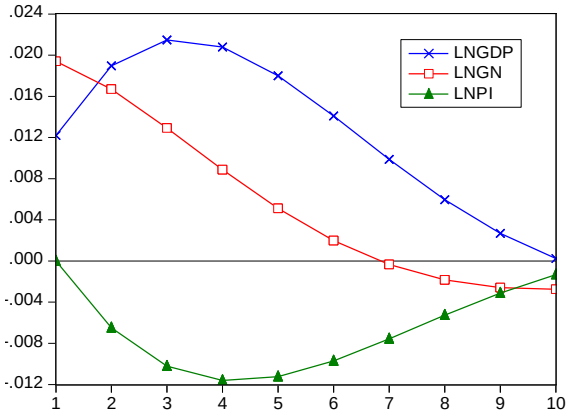

Figure 7. Response of income gap to the impact of three variables

3.4 Variance decomposition

The impulse response function analyses the dynamic path of the impact of a variable on another variable. However, it does not reflect the contribution rate of each impact on endogenous variable fluctuation, whereas variance decomposition could break down the variance of each variable in the VAR system to each disturbance term. By analysing the contribution rate of each structural impact on endogenous variable fluctuation, the importance of different structural impacts was further evaluated. Based on the impulse response function, this paper adopted the variance decomposition method to break down the variances of forecast errors for the private investment (LNPI), economic growth (LNGDP), and income gap (LNGN) indicators in different estimated phases. The results are presented in the following figures.

Table 4. Shows that economic growth had a strong impact on private investment; in the fourth phase, it already accounted for more than 53% of the prediction error for private investment and exhibited gradual growth. The contribution rate of the income gap to private investment was quite high in the first three phases, reaching approximately 50%. After that, it gradually declined. The contribution rate of private investment reached 47.60221% during the current phase, but then dropped dramatically before slowly starting to increase again starting in the fourth phase.

Table 4. Variance decomposition results of LNPI

Variance	S.E.	LNGDP	LNGN	LNPI
1	0.042351	5.569792	46.82799	47.60221
2	0.07913	27.93862	54.59568	17.4657

3	0.125428	43.75296	49.27616	6.970878
4	0.177286	53.07863	42.2573	4.664071
5	0.230368	58.69053	36.28458	5.02489
6	0.281303	62.24736	31.62046	6.132188
7	0.32787	64.61471	28.05484	7.330452
8	0.3689	66.25679	25.34401	8.399201
9	0.404073	67.43649	23.28764	9.275867
10	0.433669	68.3106	21.73096	9.958434

Table 5 shows that the contribution rates of income disparity and private investment to the prediction error of economic growth were both zero in the current phase but then increased at varying degrees. The contribution rate of the income gap to economic growth, which generally remained within the range of 20% to 30%, was rather large. The contribution rate of private investment to economic growth fluctuated slightly during the initial phase and then began to increase gradually starting in the fourth phase, indicating that private investment has a long-term influence on economic growth and that this influence was even greater in later phases. The contribution rate of economic growth to its own prediction error reached 100% in the current phase and then remained at approximately 70% after experiencing a modest decline.

Table 5. Variance decomposition results for LNGDP

Variance	S.E.	LNGDP	LNGN	LNPI
1	0.016734	100	0	0
2	0.028274	84.56652	14.7015	0.731975
3	0.044699	73.02174	26.67528	0.302973
4	0.065245	68.71777	30.72216	0.560073
5	0.088416	67.8043	30.58379	1.611907
6	0.112688	68.11618	28.85771	3.026113
7	0.136723	68.78341	26.7311	4.48549
8	0.159493	69.48809	24.68425	5.827655
9	0.180321	70.1258	22.88809	6.986109
10	0.198863	70.67201	21.38304	7.944946

Table 6 shows that the contribution rate of private investment to the prediction error of income disparity was zero in the current phase but then increased gradually, reaching 16.55161% in the tenth phase; this indicates that private investment had a long-term effect on income disparity. The contribution rate of economic growth to income disparity increased consistently over time, stabilising at approximately 57% in the sixth phase. The contribution rate of income disparity to its own prediction error was the greatest in the current phase, reaching 71.65%, and then declining gradually and staying at approximately 26% after the seventh phase.

Table 6. Variance decomposition results for LNGN

Variance	S.E.	LNGDP	LNGN	LNPI
1	0.022923	28.34756	71.65244	0
2	0.034726	42.18188	54.32818	3.489942
3	0.04403	50.04467	42.40665	7.548682
4	0.050838	54.27425	34.85433	10.87142
5	0.055326	56.41381	30.28198	13.30421

6	0.057945	57.34086	27.72306	14.93608
7	0.059267	57.5883	26.50371	15.90799
8	0.059824	57.50862	26.10574	16.38565
9	0.060021	57.33233	26.1211	16.54657
10	0.060099	57.18542	26.26297	16.55161

3.5 Granger causality test

Granger was the first to propose causality from the forecast perspective; this is referred to as Granger causality. In a time-series model, Granger causality between two economic variables X and Y is defined as follows: Given past information on variables X and Y, the forecast effect of variable Y was better than that past information on variable Y. That is, if variable X helped explain future changes in variable Y, then X was deemed to Granger-cause variable Y.

The test obtained the following results: (1) At a significance level of 5%, the F-test rejected the null hypothesis that LNGN did not Granger-cause LNGDP, but could not reject the null hypothesis that LNGDP did not Granger-cause LNGN, indicating that the income gap was the Granger cause of economic growth, but economic growth was not the Granger cause of the income gap. (2) At a significance level of 5%, the F-test rejected the null hypothesis that LNPI did not Granger-cause LNGDP, but could not reject the null hypothesis that LNGDP did not Granger-cause LNPI, indicating that private investment was the Granger cause of economic growth, but economic growth was not the Granger cause of private investment. (3) At a significance level of 5%, the F-test could not reject the null hypothesis that LNPI did not Granger-cause LNGN, but could reject the null hypothesis that LNGN did not Granger-cause LNPI. To sum up, the following conclusions can be reached: Income disparity and private investment are both Granger causes of economic growth and income disparity is the Granger cause of the increase in private investment.

Table 7. Results of the Granger causality test

Causality assumptions	Number of lag phases	F statistical value	P value
LNGN did not Granger-cause LNGDP	1	21.2663	0.0004
LNGDP did not Granger-cause LNGN	1	0.12004	0.7341
LNPI did not Granger-cause LNGDP	1	8.10878	0.0129
LNGDP did not Granger-cause LNPI	1	0.02489	0.8769
LNPI did not Granger-cause LNGN	1	0.30936	0.5869
LNGN did not Granger-cause LNPI	1	16.1873	0.0013

4. Conclusions

The income gap among Chinese residents is increasing for several reasons. Among them, private investment and economic growth are important factors that should not be ignored. Studying the interplay between private investment and economic growth or that between private investment and the income gap among residents is essential to improving the current irrational income distribution system in China, optimising the social distribution system, and boosting healthy economic development. This paper has reached the following conclusions through the empirical examination of time-series data from the period between 1995 and 2012:

1) Income disparity, private investment and economic growth have a long-term co-integration relationship with each other. The income gap among residents Granger-causes economic growth, but not vice versa. Economic growth increases the income gap, and this widening of the income gap facilitates economic growth.

2) Private investment Granger-causes economic growth, but not vice versa. Economic growth plays an important role in facilitating private investment, whereas an increase in private investment may hinder economic growth. They have long-term effects on each other.

3) The income gap among residents is the Granger cause of private investment. An increase in private investment helps narrow the income gap. However, the widening of the income gap contributes to boosting private investment. Private investment has a long-term effect on the income

gap; namely, the longer-term the investment, the greater its impact is.

Based on other income inequality research, this paper has explored the mechanism of action among private investment, economic growth and income disparity. However, this paper has mainly examined the bidirectional influence between private investment and economic growth and that between private investment and income disparity but has not analysed the asymmetrical influence among the three variables or other economic phenomena related to income inequality, such as the level of industrialisation, regional differences and other factors. These problems represent the opportunities for further study suggested by this paper.

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