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The Impact of Monetary Policy on Income and Wealth Equality

Yiran Liu[1,a,*]

[1]*Sino-French Institute, Renmin University of China, Beijing, China, 100872*
a. baizhene7@sina.com
**corresponding author*

Abstract: The gap between rich and poor has become one of the inescapable problems of the 21st century. It is important to study whether monetary policy can cause inequality in the distribution of income and wealth and, consequently, the widening of the income and wealth gap. This paper first introduces the three channels through which monetary policy affects the distribution of income and wealth, and analyses their effects on inequality according to different transmission mechanisms. The paper analyses the impact of monetary policy on wealth inequality from both empirical and theoretical perspectives and draws broad conclusions: 1. accommodative monetary policy reduces the debt burden of households, reduces the downward pressure on the economy, and thus promotes wealth equality; 2. expansionary monetary policy widens income inequality through the asset mix channel. Finally, combined with the theoretical analysis, the paper gives corresponding suggestions for optimising and improving China's monetary policy.

Keywords: monetary policy, transmission mechanism, household income, wealth inequality

1. Introduction

At present, income distribution remains a prominent issue globally. According to data provided by the United Nations, the gap between global income levels continues to widen, which has become a major global problem. In the wake of the world financial crisis and the adoption of traditional and non-traditional expansionary monetary policies by central banks, Western economists have begun to debate the impact of monetary policy on national income and resource imbalances. There are many different views on whether monetary policy, whether loose or tight, contributes to income and wealth inequality. This paper will firstly analyse the impact of monetary policy on wealth distribution and income distribution under different channels, then explore the role of different monetary policies on income and wealth distribution equality at both theoretical and empirical levels, and finally propose corresponding policy optimisation recommendations based on the findings.

2. Literature Review

In the early years, there have been few empirical studies on the relationship between monetary policy and income distribution because the role of monetary policy in income distribution has been neglected. In recent years, the continued implementation and adjustment of monetary policy in countries around the world has aroused widespread concern about the effects of monetary policy on

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income distribution. There are two completely different views on the role of expansionary monetary policy in the income distribution of the population. One view is that expansionary monetary policy widens income disparities; for example, Inui and Andersen argue that expansionary monetary policy increases income distribution inequality by increasing the top income share and decreasing the bottom income share of the income distribution [1, 2]. Another opinion is that expansionary monetary policy will reduce income disparity. Furceri calculated the changes in government earnings in 32 developed countries with emerging market economies for the period 1990-2013, and the results showed that tight monetary policy will increase income inequality as well as that expansionary monetary policy will have an impact on income inequality [3].

Research on the role of tight monetary policy in the distribution of income among the population has also reached different conclusions. One view is that under tight monetary policy, income inequality decreases due to distortions in the credit market, an increase in the money supply, etc. For example, Mumtaz and Theophilopoulou construct a historical measure of inequality for the period 1968-2012 based on detailed micro-level information to examine how monetary policy shocks affect income disparities and show that tight monetary policy shocks have caused a worsening of income distribution [4]. However, it has also been argued that tight monetary policy has led to a reduction in income differentials. For example, Davtyan estimated the distributional effects of monetary policy for the United States, showing that tight monetary policy reduced income inequality and income disparity in the United States. At the same time, he also finds that monetary policy has a "counter-adjustment" function, which can lead to a further increase in income inequality after the implementation of tight monetary policy [5].

As the government has long neglected the role of monetary policy in regulating income distribution, there is not much research literature on this topic in China. In a summary of all the relevant research findings, Professor Zhang Qidi found that although there are still divergent views on the inequality of income distribution caused by monetary policy, the research findings also indicate that whether monetary policy increases inequality or not depends on the initial economic situation [6]. Therefore, when examining monetary policy and inequality in income distribution, it is necessary to take into account the differences in the level of economic development and the effects of policy implementation in different periods.

3. Mechanisms of Influence

3.1. Revenue Channel

The income composition channel, which is influenced by monetary policy, means that workers have different income compositions due to their different endowments and initial wealth, which ultimately results in an inequitable distribution of income. Income structure determines income disparity, and income disparity also affects consumption demand, which in turn influences the effect of macroeconomic policies. According to Piketty in his book Capitalism in the 21st Century, as income levels rise, the proportion of wage income decreases and the proportion of business income increases [7]. It is therefore assumed that the share of business income in total household income is greater for high-income households than for low-income households. All other things being equal, assume that the central bank adopts an expansionary monetary policy, resulting in an increase in the price level, and that wages rise at a slower rate than the money supply due to wage rigidity, resulting in a lower real wage level and a corresponding reduction in the cost of production of products and wages, so higher profits for enterprises. If the proportion of business income among residents is too low or too high, it will lead to under-consumption, which will slow down economic growth or even cause negative growth, thus leading to a further widening of the income gap between residents. Due to the expansionary monetary policy adopted by the central bank in China, the total business income grows

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faster than the total salary income, and also because the proportion of business income of higher-paid residents is much larger than that of lower-paid residents, the total income of higher-paid households grows faster than that of lower-paid residents, which eventually causes the income gap to widen. Thus, the impact of expansionary monetary policy on income disparity is positive and effective.

3.2. Asset Portfolio Channel

The asset mix channel is the change in asset prices caused by a change in monetary policy, which causes residents to reallocate their holdings, resulting in a redistribution of wealth. If the money supply is expanding or contracting, this will reduce the rate of return on assets. Assume that the low-income group owns more assets as a share of total household income than the high-income group. At the same time, an increase in the money supply leads to an increase in asset prices, which in turn stimulates an increase in consumer demand. Other things being equal, the expansionary monetary policy adopted by the central bank leads to inflation because the proportion of cash owned by low-income households is much higher than that of high-income households, with the result that low-income households bear a higher burden of inflation. At the same time, expansionary monetary policies have led to a change in the mix of assets held by low-income households, resulting in more financial assets being held. For some low-income families with higher asset holdings and savings, expansionary monetary policies have reduced real returns and increased inflation levels, reducing the purchasing power of low-income households and resulting in a greater welfare loss for them. For higher-income households, which hold more financial assets, expansionary monetary policy causes an increase in the value of financial assets, which directly raises the financial wealth of higher-income households, for example. For low-income households, then, with fewer or more financial assets, it is impossible to avoid the adverse effects of expansionary monetary policy on income, leading to greater losses for low-income households and thus not conducive to reducing the income distribution gap.

3.3. Family Credit Channel

Changes in the money supply have had an income distribution effect on the financial wealth of households, which is closely linked to the financial market, and this has led to a further widening of the income gap between low-income households, which in turn has led to a financial and social divide between the rich and the poor. At the same time, the incomplete credit market makes it difficult for low-income households to obtain loans from banks to expand their production due to credit constraints, and they have to rely on private borrowing and other informal means to obtain funds. For higher-income households, more collateral makes it easier for them to raise funds in the formal financial market and thus expand their production, leading to greater inequality in income distribution. On this basis, tight monetary policy can mitigate the imbalance in income distribution by improving the macroeconomic structure, increasing the savings rate of the population, and discouraging consumption. However, tight monetary policy measures can also lead to a decline in household balance sheets and an increase in household debt levels, putting households at risk of bankruptcy. In the liquidity effects perspective, the credit effect is mainly through its impact on consumers' willingness to consume, rather than on lenders' willingness to lend. Therefore, in a tight financial environment, banks are likely to adopt tighter credit policies to reduce the cost of lending. Due to asymmetric quality information, consumer durables, like housing, are highly illiquid assets. As a result, in times of interest rate changes, higher-income households have a greater ability to pay than other households and are thus able to spend their cash on consumer durables or housing, thus widening the income gap.

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4. The Role of Monetary Policy in the Distribution of Household Income and Wealth - On a Theoretical basis

The economists have classified the above channels through which monetary policy affects household distribution into two main types: direct and indirect. Indirect effects include interest rates, propensity to consume, and inflation. The direct effect refers to the immediate impact on households of changes in policy interest rates when employment conditions, prices and wages remain constant. It refers mainly to the direct effect of changes in nominal and real interest rates on the amount of household savings (i.e., the intertemporal substitution effect, etc.), on net financial income. The direct effect can lead to differences in the composition of asset-liability portfolios between households, reducing interest payments for households holding debt when the policy rate falls, and also reducing financial income for households holding short-term assets, whose real returns will fall.

This paper examines the economic behaviour of households under different asset choices and their response mechanisms to changes in interest rates. Firstly, the analysis of asset items on the household balance sheet shows that the effect of lower interest rates on such assets varies across households, as they have different asset classes (e.g., property, bonds, and equities) and maturities, and there are also significant differences in the assets of residents across regions and classes, which leads to an uneven distribution of wealth across households of different income levels. Since wealthy households have relatively large financial assets, investment income is particularly important in the asset allocation of these households. Wealth indices can therefore be used to measure asset allocation. As shown in Figure 1, by the third quarter of 2022, the top 0.1% of households in terms of net wealth had holdings that included mutual funds and private corporate capital, accounting for 40.3% and 31.4 % of their net assets, respectively, but these two capital holdings accounted for only 1.8% and 1.4% of household capital in the bottom 50% of the wealth group. In addition, the estates of households in the bottom 50% wealth group account for about 58.8% of their assets, but this ratio is only 9% for the top 0.1% of households in the bottom wealth group. This shows that property prices have a significant positive effect on the distribution of wealth. This means that loose monetary policy is more equitable in terms of the value of property acting on government tax revenues and property distribution than it is through asset income.

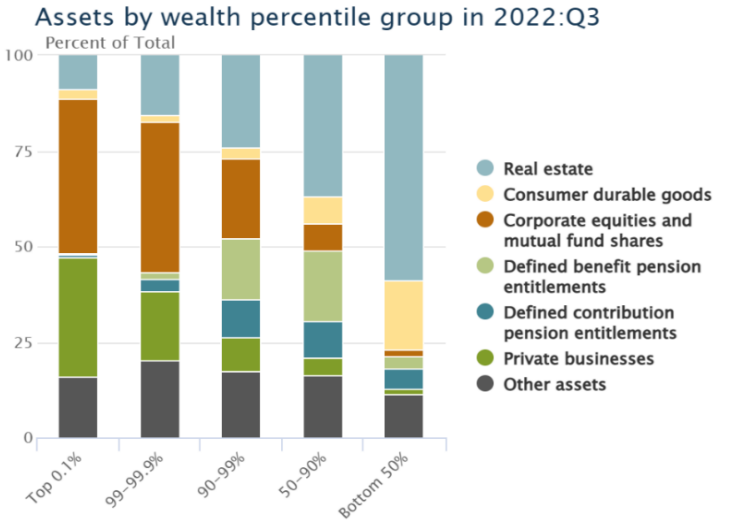

Figure 1: Assets by wealth percentile group in 2022:Q3 [8].

Combined with the analysis of household balance sheet liabilities, accommodative monetary policy has led to greater indebtedness in the household sector. The analysis finds that accommodative monetary policy has a significant positive effect on the asset structure of different households and on

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the level of disposable income of households. Figure 2 shows that home mortgages owned by households in the top 0.1% wealth group accounted for 42.9% of all assets in the first three quarters of 2022, and 48.6% in the bottom 50% wealth group. This shows that the share of mortgages in household disposable income is positively correlated with house price growth. Therefore, a loose monetary policy should have an impact on household disposable income by reducing the proportion of principal and interest payments on collateralised debt assets. Statistics from the St. Louis Federal Reserve show that the share of personal disposable income accounted for by principal and interest payments on mortgage debt in the US has fallen rapidly from a peak of 71.8% in Q4 2007 before the global financial crisis to 3.96% in Q4 2020. Thus, for mortgage-holding households, the loose monetary policy has helped to reduce the pressure on household debt. In addition, as lower interest rates increase households' investment returns and consumption returns, they indirectly reduce households' need to save, thereby increasing their disposable income. However, since debt covenant requirements are rigid and most mortgage lending contracts are fulfilled at a fixed interest rate, the pass-through effect of interest rate changes on households' distributable income is also limited. In addition, accommodative monetary policies can also lead to an increase in the number of savings deposits by households, which in turn can provide a further stimulus to their investment spending. Overall, however, a loose monetary policy still leads to a reduction in such assets, resulting in higher disposable income.

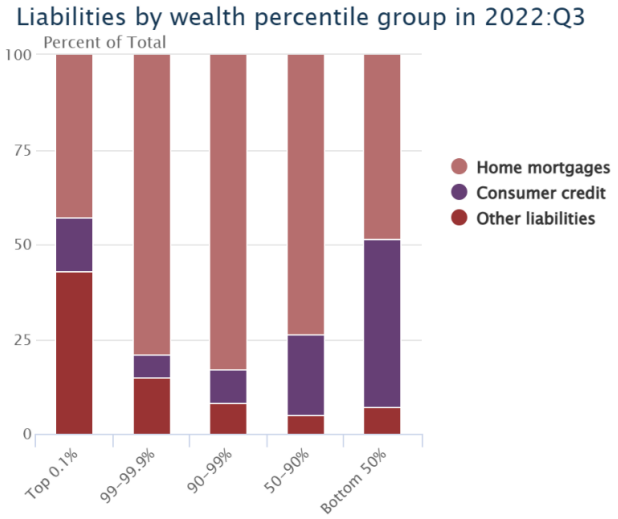

Figure 2: Liabilities by wealth percentile group in 2022:Q3 [9].

Indirect effects refer mainly to the impact of changes in monetary policy on prices, wages, and employment. The income composition channel mentioned above falls within the scope of indirect effects. Changes in both the money supply and interest rates can lead to changes in the price level, which in turn can lead to increases in wages or labour productivity. For example, a reduction in policy interest rates will boost household consumption through an intertemporal substitution effect, and encourage corporate finance by reducing the cost of government investment, which will lead to higher output and upward pressure on employment and wages. At the same time, higher employment and wages will lead to an increase in global aggregate demand, which in turn will lead to increased social productivity, higher employment, and higher wages.

The analysis shows that different households react differently to the negative effects of monetary policy because of the differences between their main source of income and their actual level of income. According to figures given by the Congressional Budget Office, the total capital income of the top 20% of households in the country is 17% of their net income, while the share of total capital income of the top 1% of households is even larger, at over 36%. Clearly, these households typically respond

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more to the implementation of monetary policy than to changes in labour income. In contrast, around 80 % of households have only 2-3% of capital income in their total income, so in terms of the composition of wealth as a channel, loose monetary policy is likely to be more favourable to wealthy households. In terms of income levels, on the one hand, low-income households are more likely to be out of work during economic downturns and more sensitive to changes in the business cycle under a loose monetary policy. On the other hand, the complementarity of capital and technology in the context of loose monetary policy increases the income of skilled labour and reduces the income of unskilled labour, thus widening income inequality. Therefore, an accommodative monetary policy can increase household wages and reduce household income inequality by boosting economic activity and reducing downward pressure on the economy.

5. A Study on the Impact of Monetary Policy on Household Income and Wealth Distribution - On the Basis of empirical Evidence

In the theoretical field of monetary policy, empirical researchers typically use the definition made by former British commercial bank management theorist Dr Elena Gerko and Dr Helene Rey of London Business in 2017: an over-expected change in long-term support for current monetary policy or a change in expectations for future monetary policy. This definition emphasises the short-term effects of monetary policy shocks on economic growth, while ignoring their long-term effects. One of the findings is that expansionary monetary policy has widened income inequality through the asset mix channel.

Edmond Berisha, a teacher at Montclair State University in California, is representative of those who have proposed this conclusion. He has studied this phenomenon from a macro perspective. In his view, both equities and debt are important in the balance sheet of households, and by examining the long-term changes in these two components of the balance sheet of households at different income levels, it is possible to understand how the impact of interest rates on household income is generated through these two channels [10]. With US government statistics from 1919 to 2009, he uses statistical analysis of US interest rates, equity market analysis, home mortgage debt, and government income distribution, and the correlation between these four. Berisha's empirical analysis is based on three statistical measures of income inequality-the Gini coefficient, the Theil index, and the inverted Pareto-Lorenz coefficient.

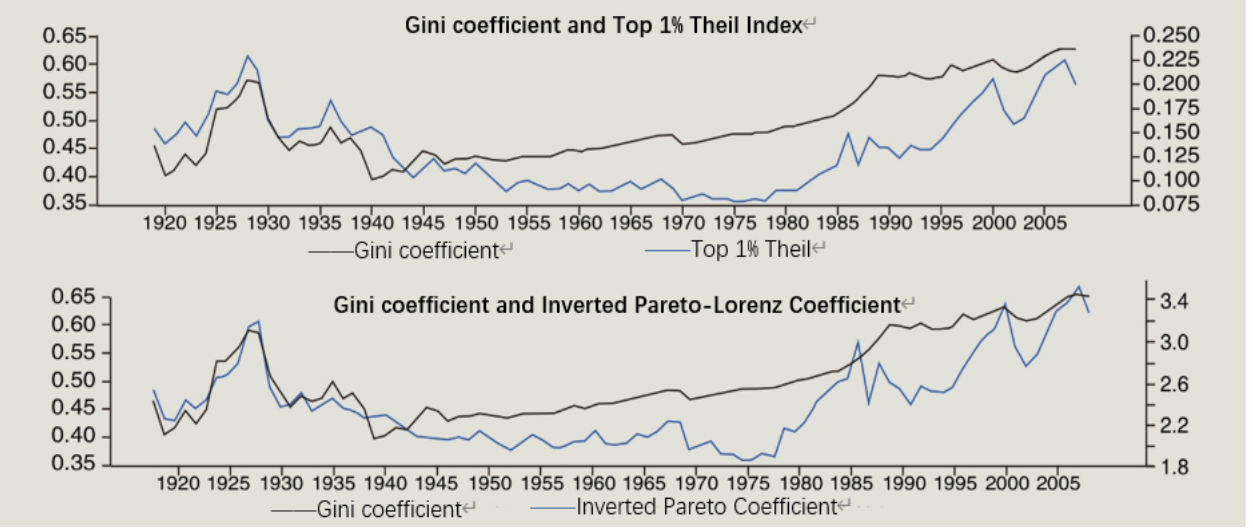

Figure 3: Trends in income inequality in the United States, 1919-2020 [10].

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Both the Gini coefficient and the Theil index have been found to describe the income disparity in a country, they are stable and both can be used to measure the income disparity in a country or region. The Gini coefficient is very sensitive to changes in middle-income levels, but does not show the characteristics of income inequality and the evolution of inequity in a country. In contrast to the Gini coefficient, the Thiel index captures the change in the proportion of income between the top 1% of households and the other 99% of households in the lower income bracket. The inverse Pareto-Lorentz coefficient can be further used to represent the change in income inequality between the top 1% of households and the top 0.1% of households, compared to the Theil index. As shown in Figure 3, the change in the Gini coefficient from the 1980s to the present is not only less volatile compared to the other two indices, but also the change in the slope of the curve is relatively smooth, indicating that the change in the Gini coefficient underestimates the uneven change in per capita income of the country. Thus, comparing these three different indicators, it is clear which types of household income are most affected by changes in financial variables such as interest rates, the stock market, and mortgage debt.

The data show that the estimates of all three indicators exhibit a negative correlation between interest and income inequality, but in contrast to the Gini and inverse Pareto-Lorenz coefficients, the Theil index captures the statistically significant impact of a one-standard-deviation interest rate shock on the imbalance in living standards of high-income households and suggests that market-expansionary monetary policy widens the gap between high-income residents in the lower 1% and the other approximately 99% of the population. There are two main reasons for this : Firstly, the Gini coefficient and the inverse Pareto-Lorenz coefficient are close in the income levels of the population studied; secondly, as a large proportion of the total income (e.g., capital gains) of high-income households above 1% is derived from interest-sensitive assets, and profit income from corporate business accounts for about 30% of their total income, low-interest rates allow this group of residents with high income to expand their economic activities, and have thus enabled this group of residents with high per capita incomes to expand their access to finance in the market, thereby increasing the ratio of asset income to total household income. Among the assets of the higher 1% of households with higher incomes, corporate equity, securities, liquid assets and instruments of other financial institutions together account for about 80% of the assets, while these liabilities account for less than 25% of the liabilities of the bottom 60% of households, and two-thirds of the remaining assets of these households is property. All three of these measures of imbalance point to the fact that since changes in yields are negatively correlated with the stock market, lower yields lead to higher stock markets and an increase in income inequality. In the case of China, since the majority of low and middle-income households have mainly property assets, the increase in their debt comes mainly from the increase in the interest rates on mortgage debt, i.e., a large proportion of the total income of this group of households has to be used to cover the interest on external household debt or to repay the principal directly, so that the increase in household debt will also further increase income inequality.

In short, the fall in interest rates on loans will have a direct impact on income inequality due to the different sources of household income, but the fall in yields may also indirectly increase inequality by taking advantage of the significant pressure on the distribution of government income from state debt and equity markets.

6. Policy Recommendations

On the policy side, recent surveys have shown that changes in monetary policy and regulation can have an impact on the equity aspects of income distribution and property in all countries, and some national central bankers have suggested that central banks and authorities can prevent income and property inequality from worsening by implementing effective macro-prudential surveillance, fiscal policy, and social protection measures:

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Firstly, central banks can influence or make access to credit more efficient through macroprudential policy measures and thereby achieve a direct impact on the distribution of income and property. Measures implemented in this regard include asset-based credit-to-value ratios, asset-based loan-to-value ratios, and capital-based bank capital adequacy ratios. While a stricter credit-to-value cap might allow that only limited mortgages are available to low-income households with a desire to purchase a home, a smaller credit-to-value ratio might, in a more macro-prudential perspective, mitigate the investment risk of low-income housing and its potential for future default, thus also reducing asset inequity.

Secondly, the Chinese government can use a variety of fiscal policy instruments and other policies to change the imbalance in income and property. One of the most important fiscal instruments is taxation. The government can use progressive tax rates to reduce inequality in after-tax income, as well as by paying taxes on assets and inherited property. In response to state spending policies, local governments may also reduce income inequality by directly transferring part of the expenditure to poor households, such as unemployment benefits, to increase their disposable income.

Finally, central banks and financial market regulators have instruments other than monetary policy that can have a more direct impact on the distribution of income and wealth, such as measures aimed at promoting the development of financial markets, reciprocity of funds, and the facilitation of access to capital market fees, deposits, insurance, and other services, all of which can reduce income and wealth imbalances.

7. Conclusion

As there are different channels of impact of monetary policy on the wealth of household income ,and there are differences between the main sources of income and the actual income levels of different households, monetary policy has different impacts on income and wealth inequality: on the household salary side, loose monetary policy can mitigate inequality by stimulating economic development and increasing household disposable income; on the asset and liability side, expansionary monetary policy may increase non-wage income for households with different asset allocations, thereby increasing income and wealth inequality. The impact of monetary policy is therefore a two-way process, the final outcome of which depends on the specific money demand function chosen by economic agents and their corresponding macroeconomic variables.

The limitation of this paper is that the empirical part lacks model-based data analysis and research, and the results of the analysis do not reach a uniform conclusion and are only explored through a limited number of different perspectives. In the future, mathematical models can be added to the study, and the results of the model analysis can be used to refine the current conclusions.

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