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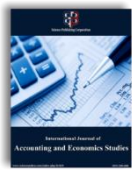

# Fiscal Policy and Social Equity: The Redistributive Effects of Government Spending on Inequality

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**Abstract**

The paper analyzes the redistributive impact of government expenditures on income inequality in Chinese provinces through a synthesis of fiscal incidence analysis, benefit incidence approaches, and panel econometric analysis. Based on provincial expenditure data for 2019-2021 and household-level inequality indicators, the analysis assesses the impacts of education, healthcare, social security expenditure, and intergovernmental transfers on driving market and post-fiscal income distribution. Findings indicate that the fiscal policy has a strong equalizing role in that the Gini coefficient of 0.467 (market income) is reduced to 0.414 when direct transfers are added and to 0.384 when in-kind education and health benefits are subsequently added. The results of benefit incidence suggest that education and healthcare expenditure are quite pro-poor, whereas social security-ty and welfare are almost neutral based on institutional fragmentation. Fixed-effects regressions establish the strong negative association between education and health spending and inequality, and a weak and not statistically significant association between welfare spending and inequality. Intergovernmental transfers show the significant equalization effect, which displays the significance of central-local fiscal coordination. Taken together, the findings confirm the multi-channel ability of the Chinese fiscal system to diminish inequality, but also point to the existence of structural constraints to redistributive possibilities, notably in the welfare sector. Policy proposals aim at reinforcing human capital expenditure, enhancing healthcare equity, reforming disjointed welfare, and allocating transfers to promote social equity.

***Keywords***: *Fiscal Policy; Income Inequality; China; Fiscal Incidence; Benefit Incidence; Pan-El Data; Redistribution; Education Expenditure; Healthcare Expenditure; Social Security; Intergovernmental Transfers.*

## 1. Introduction

The issue of income inequality is now one of the legitimizing characteristics of modern economic development, especially in societies undergoing high rates of structural change. The shift of China towards a market-oriented economy through the abandonment of the centrally planned system has generated unprecedented growth in output and productivity, together with improved living standards. In the last 40 years, the true income growth, technological modernization, and globalization have turned China into the second-largest economy in the world. Nevertheless, these gains have come with the increase in inequalities in income, wealth, access to government services, and regional growth. High economic performance in the presence of existing inequality poses some important questions on the role of fiscal policy in ensuring social equity (Li & Liu, 2024). With China proceeding to a new stage of development with slower economic growth, demographic aging, and policy focus on the issue of common prosperity, the redistributive effect of government spending will become more significant. The fiscal policy is considered one of the key tools in combating inequality. Governments can use taxation, government spending, transfers, and subsidies to manipulate resource allocation and opportunity distribution, reduce the disparities caused by the market, and foster inclusive development. Fiscal redistribution in terms of taxes and transfers is decreasing inequality by large margins in most developed economies. Conversely, certain smaller impacts are generally realized in the developing and emerging economies because of structural limitations, the lack of tax progressivity, and the lack of social welfare nets. China is at a middle ground between these extremes (Wang & Zhang, 2025). Even though the country has greatly improved its financial ability, the welfare regime is still comparatively low in terms of the level, and the redistributive effect of government spending is still dynamic. This is why China is a valuable and informative example in understanding the interaction between the fiscal policy and inequality.

Although there is an increased academic interest, the available literature on the redistributive impacts of government expenditure in China is not yet perfect. The researchers note the significant role of education, healthcare, and pensions in long-term equity, whereas other researchers note limitations, which include inadequate levels of benefits, rural-urban inequalities, and intergovernmental fiscal inequalities. In addition, the literature on the subject is often confined to individual policy sectors or particular periods of time, and it is hard to come up with a broad, modernized view of how fiscal spending is redistributive in China (Ji et al., 2025). This vacuum elicits the necessity of a systematic study that unites the theoretical constructs, national statistics, and inter-sector empirical data.

### 1.1. Research problem

The main issue that made this research possible is the rather low level of clarity and irregular evidence of how much the government expenditure in China narrows income disparity in various regions, societal strata, and areas of policy. Even though social expenditure has increased significantly in relative terms, its redistributive efficiency is questionable. There are still questions on whether spending is sufficient to address underprivileged groups, whether the benefits are high enough to correct the structural disparities, and to what extent inequality decreases given the effects of government services, transfers, and intergovernmental fiscal arrangements are made jointly. In the absence of a thorough evaluation, policymakers do not have the empirical basis upon which to bolster fiscal instruments that will lead to the promotion of social equity.

### 1.2. Research objectives

In order to cope with this issue, the study targets four interconnected objectives.
It will first investigate the structure, size, and growth of government expenditure in China, especially in such social segments as education, healthcare, social security, and welfare support. The knowledge of expenditure patterns is paramount in assessing the avenues through which the fiscal policy affects inequality.
Second, the paper aims to examine how such expenditures redistribute both the market income inequality and the disposable income inequality. This will include combining evidence based on national datasets, household surveys, and empirical research to establish the extent to which inequality can be reduced by using public spending.
Third, the research is intended to determine the structural, institutional, and policy-related limitations to the effectiveness of fiscal redistribution. These are hukou-based welfare segregation, regional fiscal imbalances, lack of progressiveness in the tax regime, and non-coverage of informal workers.
Lastly, the research aims to make policy suggestions that will result in the improved equity-enhancing facet of fiscal policy in line with the long-term development goals of China.

### 1.3. Research questions

To inform this analysis, the research questions asked in the study are the following:

- How much does government expenditure in China alleviate national and regional levels of income inequality?
- What are the most redistributive elements of public spending, education, health, social security, transfer, or intergovernmental fiscal mechanisms?
- What are the structural limitations to the effectiveness of fiscal redistribution in China, and what are the implications of these limitations on overall outcomes?
- What can be done to improve the fiscal policy to increase social equity and facilitate the larger shared prosperity of China?

These questions represent both the empirical and conceptual aspects of the issue and offer a guideline to appraise the redistributive implications of the fiscal policy.

### 1.4. Significance of the study

This research has value, as it can inform policy-making and a debate in academic circles. Academically, the research is relevant to a growing body of literature that attempts to comprehend the operations of fiscal systems in large economies that evolve rapidly. The institutional setup that generates the opportunity to test theories of fiscal federalism, human capital formation, and welfare state development is the unique institutional structure of China, with its centralized revenues and decentralized expenditure roles and its hybrid model of welfare states. The research provides multi-sector evidence that is valuable in improving comparative insights into the use of fiscal policy in emerging economies to support social equity.
Politically, the study is specifically timely as China is undergoing changing socioeconomic trends. Fiscal-demographic Demographic aging, technological change, urban-rural inequalities, and declining economic growth place even greater strains on the fiscal system (Sun & Sun, 2024). The policymakers need clear insights to know what aspects of government expenditure provide the most benefits in terms of equity, where inefficiency exists, and how redistributive processes can be enhanced.
Furthermore, the tendency of China to create a more inclusive society under the umbrella of so-called common prosperity increases the necessity to investigate the correlation between fiscal policy and inequality empirically.
In addition to China, the study has wider implications for other growing economies that want to find an equilibrium between growth and social equity. The experience of China can be used to inform discussion about the most effective ways to distribute the limited state resources, shape social protection strategies, and reduce inequality in the transitional environment as developing countries continue to expand their fiscal systems.
Overall, this paper offers an in-depth and timely analysis of the effect of government expenditures on inequality in China. The Introduction provides a good foundation for further analysis by revealing a definite research problem, outlining specific objectives, formulating specific research questions, and displaying high policy and theory relevance.

## 2. Literature Review

### 2.1. Fiscal policy and redistribution: global perspectives

Fiscal policy is always mentioned in global studies as one of the most effective tools to minimize income inequality in both developed and developing economies. The high level of inequality is mitigated in highly developed welfare states where the wide tax-and-transfer systems can bring down the inequality rate by 15-20 Gini points. According to scholars, this result is mainly brought about by progressive taxation, direct cash transfers, and broad systems of social protection. The above measures enable governments to counter the inequities created by market forces and provide wider access to vital services to the population, including healthcare, pensions, schooling, and unemployment benefits. By contrast, more limited redistributive impacts are frequently the feature of studies concentrating on emerging economies (WID.world, 2024). The overall effects of fiscal redistribution are mitigated by such constraints as small tax bases, huge informal sectors,

inadequate administrative capacity, and relatively small social expenditures. The Latin American and Southeast Asian example of evidence demonstrates that although equalizing education and healthcare in the long term can be facilitated by public services, the redistribution in the short term in the form of cash transfer or progressive taxation is smaller. This pattern is a great source of information in comprehending the fiscal environment in China that has both the features of a developed and a developing country. The increasing fiscal capacity and the rising social spending of China are similar to the trend of the growing welfare states; however, they differ in the way of structural disparities in taxation, decentralization, and institutional design, which are peculiar to the traditional welfare constructs (Zhang and Tang, 2025).

## 2.2. Chinese fiscal policy development

The fiscal regime in China has witnessed a radical transformation since the 1994 tax-sharing reform, which centralized the tax collection process but decentralized the expenditure-making aspects. In this system, most national tax revenues are raised by the central government, with more than 80 percent of all public expenditure, especially in the education sector, health sector, social security, and infrastructure, being provided by local governments. Such an unequal design has played a key role in defining the redistributive ability of the Chinese fiscal policy. Although fiscal decentralization has increased local sensitivity in terms of spending allocation, the aspect of fiscal decentralization has increased regional inequalities between the fiscally endowed coastal provinces and the less-developed regions and states (Zhao et al., 2025). Simultaneously, social spending has grown steadily in the last 20 years, which is a result of increased funding into mandatory education, insurance of health care, and pension plans. Nonetheless, this growth has not been corresponding to the increasing social demands, especially among the rural population, migrants, and even informal workers. Intergovernmental transfers have consequently become a focal point in ameliorating horizontal fiscal imbalances, and the general and equalization transfers provide a partial, yet significant effect of closing the regional inequalities in the provision of public services, although there are continued challenges of unequal service quality and local expenditure priorities (H. Liu et al., 2024).

Empirical research tends to conclude that fiscal policy in China helps to decrease income inequality, but the degree of redistribution is moderate when compared to developed welfare states. It is estimated that the effect of public spending and transfers on inequality reduces by about 6-10 Gini points, indicating the capabilities and institutional limitations of the redistributive system in China. The education expenditure has been repeatedly found to be one of the best long-term equalizers, especially with extended compulsory education and higher rural school funding, which have contributed to reduced urban-rural disparities in human capital accumulation. However, disparities in educational standards and higher education remain in favor of urban and wealthier families. Healthcare spending has also led to the reduction of inequality by increasing insurance coverage and decreasing catastrophic health spending, though the differences in reimbursement rates and the further use of out-of-pocket payments, particularly in rural regions, restrict the redistributive effect of healthcare spending (Tu et al., 2024).

In comparison, social security and welfare expenditure have a smaller and more distributive asymmetrical impact. Although the coverage of pensions has now increased both to urban and rural residents, the number of benefits is highly uneven, and in rural regions, the benefits of the pensions are relatively low. Cash transfer programs like Minimum Living Standard Guarantee (Dibao) have played a successful role in reducing extreme poverty but have not had a significant impact on the overall reduction of inequality because of low levels of benefits, high eligibility standards, and the inability to cover informal workers (Lugo, Lustig, Montalva Talledo, et al., 2024). Intergovernmental transfers also boost the fiscal power of poorer provinces and contribute to the provision of social services, but local governments tend to allocate such transfers to growth-oriented infrastructure expenditure rather than redistributive social expenditure, limiting the inequality-reducing potential of such transfers (Yang et al., 2024). Collectively, the literature indicates that although the fiscal system of China has been getting more redistributive, its efficacy differs widely among spending categories and is influenced by decentralization, institutional fragmentation, and regional heterogeneity.

## 2.3. Sector-specific results of the recent research

Recent reports highlight that the problem of inequality in China is multi-dimensional. The phenomena of inequality are determined not by income distribution alone, but by institutional patterns, geographical inequalities, and varied access to state services. Urban-rural inequality is one of the most commonly discussed ones, and it is largely predetermined by the household registration (hukou) system, which influences the receipt of healthcare, education, and social protection. Another theme that keeps recurring is regional differences between coastal and inland provinces, in that the coastal regions have a higher fiscal income, higher wages, and better provision of services. The issue of human capital inequality is another issue, as disparities in access to better education and medical care remain a factor in longer-term income opportunities and movement across generations. The formal and informal workers further contribute to inequality in the labour market since the former usually do not have access to pensions, unemployment benefits, and other welfare schemes (Yan et al., 2025).

Age-old studies on the redistributive impact of sector-specific spending tend to support the claim that various forms of public expenditure are associated with the reduction of inequality in a different manner. Increased education expenditure facilitates long-run mobility, which increases the skills and productivity of poor groups. Healthcare spending makes the population less vulnerable and secure low-income families against financial shocks. The pension expenditure enables the elderly population and alleviates poverty among older age groups. Through fiscal transfers, poorer regions have better capacities in offering key public services (Xiang et al., 2025). But such sector-specific effects are not always of the same magnitude, and they also depend on the institutional limits, like fiscal decentralization and welfare segregation. All these findings indicate the significance of considering the redistribution of fiscal policy of China at the aggregate level as well as at the sectoral level.

## 2.4. Research gap

Despite having a significant amount of literature on fiscal policy and inequality in China, there are still several gaps in the field. To begin with, a significant part of current studies takes a sectoral approach, i.e., it considers education, healthcare, or pensions as independent, instead of considering their joint impact on redistribution. This piecemeal process complicates measuring the totality of the fiscal policy. Second, the majority of the studies use mostly income-based measures like the Gini coefficient and ignore multi-dimensional inequality based on access to services, inequality in regions, and institutional constraints like hukou restrictions. Third, studies are usually short-term in nature, and thus they pay little attention to the long-term or intergenerational impacts of education and health expenditure (Clements et al., 2025). Fourth, informal workers and migrant households have not been adequately explored with respect to fiscal redistribution. Lastly, the specific redistributive consequences of intergovernmental transfers have not been studied, even though they constitute a significant and

expanding part of the Chinese fiscal system. These gaps must be addressed by creating a comprehensive knowledge of the role of fiscal policy in creating inequality in present-day China.

### 2.5. Theoretical framework

This research has its foundation on three supplementary theoretical approaches that describe the effect of government expenditure on income disparity within the Chinese setting.

To begin with, the human capital theory suggests that governmental spending on education and healthcare will increase productivity, earning power, and intergenerational mobility, especially among low-income populations (F. Liu & Hu, 2025). These investments also lessen income inequalities in the long run and alleviate inequality created by market forces by enhancing access to schooling and health services. Hypotheses H1 and H2 are founded directly on this framework, and they predict that the relationship between higher education and healthcare spending and lower income inequality will be observed among provinces.

Second, the fiscal federalism theory offers a framework for explaining the redistribution in the Chinese decentralized fiscal system, whereby the local governments are given the responsibility of expenditure, whereas the revenue generation is centralized. Such vertical imbalance requires a leveling of fiscal capacity by having intergovernmental transfers so that there is greater evenness in providing the public services at regional levels (Isiaka et al., 2025). In this regard, Hypothesis H4 is driven by the fiscal federalism theory, according to which higher intergovernmental transfer is related to reduced inequality in recipient provinces.

Third, the institutional fragmentation viewpoint brings to focus the structural aspects of the welfare system segmentation, urban-rural inequalities, and low coverage of informal workers, which limit the redistributive efficiency of social security and welfare expenditure. Redistribution may be watered down by fragmented institutions that restrict the adequacy and access of benefits with increasing expenditure (Lugo, Lustig, Sonia, et al., 2024). This theoretical fact also guides Hypothesis H3, where a lower or weaker inequality-reducing impact of social security and welfare expenditure is expected in comparison to education and healthcare.

Collectively, the two frameworks offer an overall consistent theoretical framework in analysing the heterogeneous redistributive impacts of various types of government expenditure in China and inform the empirical hypothesis examined in this paper.

### 2.6. Hypotheses

H1 (Human Capital - Education):

The inequality-reducing effect of human capital investment is linked to the lower income inequality in the provinces that spend more on education in comparison to provincial GDP.

H2 (Human Capital - Healthcare):

Increased spending on healthcare by the population in the form of a percentage of provincial GDP is linked with reduced income inequality among the Chinese provinces.

H3 (Institutional Fragmentation - Welfare):

The relationship between government expenditure on social security and welfare and income inequality is likely to be less steady and consistent, as it is institutionally fragmented and does not cover benefits equally across regions and population groups.

H4 (Fiscal Federalism - Transfers):

Higher income inequality in beneficiary provinces is linked to higher per capita intergovernmental transfers, which is congruent with the role of fiscal federalism of equalization.

H5 (Integrated Social Spending):

Once the economic and demographic variables have been controlled, the provinces with total social expenditure (education, healthcare, and social security combined with GDP) are the ones that have much lower income inequality than provinces with lower social expenditure.

These five hypotheses bring out a sound empirical agenda for the study. They convert theoretical predictions into propositions that are testable and are between certain fiscal tools and the results of inequality. The empirical analysis and the following methodology are designed in such a way that they will test these hypotheses based on provincial panel data on inequality, sectoral expenditure, intergovernmental transfers, and other control variables.

## 3. Methodology

### 3.1. Research design

The research design in this study is a quantitative, explanatory design with the aim of assessing the impact of various types of government spending in China on income inequality. The analysis is based on naturally occurring changes in fiscal expenditure and household income; instead of the manipulation of variables in the experiment, it is an observational and non-experimental study. The study combines the fiscal incidence analysis, benefit incidence analysis, the inequality decomposition, as well as the panel econometric modelling (Sulaiman et al., 2025). The dual-level approach will enable the research to reflect direct distributional impacts of the government transfers on the household level and, at the same time, analyze the role of provincial fiscal trends in the formation of inequality. Based on the analysis of microdata through the national household survey, along with macro fiscal data through official statistical yearbooks, the analysis can establish a relationship between household-level income distribution and province-level policy behaviour, thus providing a comprehensive picture of the redistributive impact of fiscal policy in China.

### 3.2. Data sources

The empirical investigation is based on several credible data sources to achieve strength and coverage:

China Family Panel Studies (CFPS) and/or China Household Income Project (CHIP):

They are micro-level household surveys that offer detailed data on the income components, employment status, demographics, and social legalization that they obtain. They are applied to build up the measures of pre-fiscal (market) income and post-fiscal (disposable) income and to approximate household-level inequality (Lustig et al., 2025).

China Fiscal Data and Statistical Yearbooks:

They give the yearly data on government expenditure by the government on a functional basis (education, health, social security, general public services, economic affairs, etc), which are disaggregated by province where feasible. They enable the research to measure the state of the intensity and content of the expenditure of the population and to reflect the regional difference (Bação et al., 2024).
International Institutional Databases (e.g., World Bank, IMF, where applicable):
They are obtained using these sources to get harmonized macro indicators like GDP, social expenditure as a share of GDP, and similar Gini coefficients. They are also the yardsticks by which the fiscal redistribution in China can be placed in comparison with other economies (Gut, 2024).
Additional Policy and Research Reports:
Current empirical studies and policy analyses of fiscal incidence in China are referred to in order to justify the definitions, classification of income and transfer, and the choice of parameters to be used in inequality and redistributive index (Danso-Mensah et al., 2024).
The fact that several supplementary sources are used contributes to the elimination of possible measurement biases and increases the validity of the results.

## 3.3. Data cleaning and preprocessing

The study has rigorous data cleaning in order to provide consistency and reliability. Harmonization between household incomes across various survey waves includes the adjustment of monetary values with the Consumer Price Index as well as the transformation of irregularly reported incomes to standard annualized forms. The non-responses are handled through the conservative imputation techniques of median replacement of numerical items and nearest-neighbor matching of categorical variables, and households with irreparable inconsistencies, like households with negative disposable income, are dropped. Outliers are also dealt with by winsorising the 99th percentile to contain its effects of extreme values. Sampling weights are used in all household-level analyses to maintain representativeness at the national level. In the case of in-kind benefits like education and health, the provincial unit costs are also charged to households in terms of the number of schools going children in the public education system or membership in health insurance programmes. These pre-process actions enable the variables of income to be comparable across time, region, and type of households.

## 3.4. Definition of key variables

Market income, gross income, disposable income, and post-benefit income are concepts of income. There are several indicators used to measure inequality. The Gini coefficient is the main statistic, which is calculated with the help of its standard formula, equation 1:

$$G = 1 - \frac{2}{n^2 \mu} \sum_{i=1}^{n} (n + 1 - i)\, y_i \quad (1)$$

Where $y_i$ Is income for household iii, sorted in ascending order, n is the number of households, and μ is the mean income.
The Theil index (Equation 2) is also employed to measure other dimensions of distribution:

$$T = \frac{1}{n} \sum_{i-n}^{n} (n + 1 - i) y_i \quad (2)$$

That is responsive to differentiation at the highest end of the earnings scale. (Xiang et al., 2025)
Such fiscal variables are provincial government expenditure on education, health, social protection, and intergovernmental transfers expressed as proportions of provincial GDP or as per-capita amounts. GDP per capita, urbanization rate, industrial structure, dependency ratios, and indicators of labour markets, among others, are some of the control variables used to isolate the relationship between fiscal actions and inequality outcomes.

**Table 1:** Key Variables Used in the Methodology

| Category | Variable Name | Description | Measurement |
|---|---|---|---|
| Income | Market Income | Earnings from labour and capital before intervention | Household-level, annual |
| Income | Disposable Income | After transfers and taxes | Household-level, annual |
| Inequality | Gini Coefficient | Primary inequality measure | Index (0–1) |
| Inequality | Theil Index | Decomposition-sensitive inequality | Unitless |
| Fiscal | Education Expenditure | Government education spending | % of GDP |
| Fiscal | Healthcare Expenditure | Public health spending | % of GDP |
| Fiscal | Social Security Spending | Pensions, assistance, welfare | % of GDP |
| Fiscal | Transfers | Central–local transfers | Per capita |
| Controls | GDP per Capita | Economic development | CNY per capita |

## 3.5. Analytical strategy

The research design combines both the incidence methods and econometric estimation. The fiscal incidence analysis is used to estimate the change in inequality following a fiscal intervention. In benefit incidence analysis (Miranda-Lescano et al., 2024), the distribution of in-kind benefits to households is calculated to determine the distribution of public spending among income groups. Lastly, the econometric modelling is an assessment of the correlation of fiscal spending and inequality between the provinces and a period of time.

### 3.5.1. Fiscal incidence analysis

The analysis of fiscal incidence then goes on comparing inequality at various levels of income definition. The Reynolds-Smolensky index (Equation 3) is calculated as the redistributive effect of the fiscal policy using:

$$RS = G_m - G_d \quad (3)$$

Where

- Gm is the Gini coefficient for market income and

- Gd is the Gini disposable income coefficient.
- Positive RS means progressivity.

Post-benefit income inequality is computed in order to add in-kind benefits. The redistributive impact of education and health services can be estimated by the change in the disposable to the post-benefit income.

#### 3.5.2. Benefit incidence analysis

The benefit incidence analysis attributes public education and spending on health to households, according to their utilization. The concentration index is employed to ascertain the progressive (pro-poor) or regressive (pro-rich) spending. It is computed as Equation 4:

$$\mathrm{CI} = \frac{2}{\mu_b}\mathrm{Cov}(b_i, R_i) \tag{4}$$

Where $b_i$ Is the assigned benefit value, $R_i$ Is the fractional income rank, and $\mu_b$Is the mean benefit? A negative CI Reflects pro-poor allocation.

To estimate in-kind benefits, a household receiving sh units of a service with provincial unit cost cj is assigned in Equation (5):

$$B_{hj} = s_h \cdot c_j \tag{5}$$

Where j denotes sector (education or health).

#### 3.5.3. Econometric modelling

The econometric aspect entails the use of a two-way fixed effects model to examine the impact of provincial fiscal expenditure on inequality in the long run. The baseline model is:

$$\mathrm{Gini}_{it} = \alpha + \beta_1 \mathrm{EduExp}_{it} + \beta_2 \mathrm{HealthExp}_{it} + \beta_3 \mathrm{SocSecExp}_{it} + \beta_4 \mathrm{Transfers}_{it} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where $\mu_i$ controls for unobserved province-specific effects and $\lambda_t$ Captures temporal shocks affecting all provinces.

To reduce simultaneity bias, lagged spending is used:

$$\mathrm{Gini}_{it} = \alpha + \beta_1 \mathrm{EduExp}_{i,t-1} + \beta_2 \mathrm{HealthExp}_{i,t-1} + \beta_3 \mathrm{SocSecExp}_{i,t-1} + \beta_4 \mathrm{Transfers}_{i,t-1} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

This type of structure makes inequality bring about the explanation of fiscal choices in the previous years.

### 3.6. Identification strategy

Since the fiscal patterns can be triggered by the economic conditions or inequality patterns, the study applies a number of identification methods and minimizes endogeneity. Lagging of fiscal variables by one or two years is done to make sure that the current inequality is attributed to the expenditure of the past rather than current results. The fixed-effects estimation also removes bias caused by latent provincial characteristics like the long-run economic structure or cultural features. The omitted variable bias is restricted by the addition of a full range of socioeconomic controls. In order to further reinforce identification, the paper further tests instrumental specifications in which lagged provincial fiscal revenue or centralized fiscal directives are instruments of social expenditure, i.e., fiscal capacity constraints that are extrinsic to current inequality performance. Although such methods are not completely able to reduce endogeneity, they enhance analytical believability (Kakwani & Son, 2025).

### 3.7. Model diagnostics

This is done through model diagnostics to guarantee statistical validity. Variance Inflation Factors (VIF) are used to evaluate the multicollinearity, and a value above 10 leads to re-estimation or adjustment of variables. The heteroskedasticity is measured with the help of the White test, and the heteroskedasticity-robust (clustered) standard errors are used to correct it. The Wooldridge test of autocorrelation is used to test serial correlation in panel data, and the problem is tackled by clustering standard errors at the provincial level. The graphical analysis and the status tests are used to test whether there is residual normality. The Pesaran CD test is used to test cross-sectional dependence (which can be caused by the national policy shock or common economic conditions). Model specifications are changed where needed to deal with diagnostic failures (Rani & Kumar, 2023).

### 3.8. Robustness checks

The study performs a number of robustness checks to make sure that the results are not subject to any specific modelling option. Pattern consistency is confirmed by alternative measures of inequality, including the Theil index and the P90/P10 ratio. Subsample tests are done to compare the coastal and inland provinces because it is known that the economic structures in different regions vary significantly. The non-linear models that include the terms of quadratics test whether the redistributive effect of spending variations at greater expenditures. Sensitivity analysis rules out large outlier provinces like Beijing and Shanghai to find out whether the highly atypical regions are reflecting distortions of national patterns. Lastly, the various lengths (one to three years) of lagging fiscal variables are used to reflect the lagged effects of education and healthcare expenditure.

Finally, there is the summary of the workflow, which must be covered by the methodology.

The methodological process starts with the acquisition and pre-processing of household and fiscal data and constructing income concepts, and calculating inequality measures. This is followed by fiscal incidence and benefits incidence analysis in an attempt to estimate the distributional impact of government expenditure. Incidence calculations are followed by the estimation of panel econometric models, and diagnostics and robustness tests are done. The last way is to interpret the results with respect to policy relevance and theoretical expectations.

### 3.9. Limitations

Although there is methodological rigour, a number of limitations should be realized. Observation information does not allow for establishing a strong causal linkage between spending and inequality. The selling of in-kind benefits could cover discrepancies in service quality in different regions. Fiscal incidence premises might fail to represent behavioural reactions and informal income transfers. Wealth inequality and long-term intergenerational mobility can also be explored only to some extent due to the limitations of data. However, these constraints do not negate the overall method of analysis but rather give a background to the interpretation of the findings with caution.

## 4. Results and Discussion

### 4.1. Descriptive statistics trends of fiscal expenditure and inequality

In Table 2, the summary is the distribution of the core variables applied to the analysis according to the ten provinces during 2019-2021. Its Gini coefficient is 0.342-0.476, which can be said to have a high chance of income inequalities; this is in line with the recent results on the interprovincial disparities in China (Popp & Murphy, 2022). Mean values indicate that the education spending is on average 4.37 percent of GDP, and that the spending on healthcare is on average 3.06 percent of GDP. The spending on social security and welfare has increased by 5.32 percent, and intergovernmental transfers have the most variation and represent great disparities in fiscal capacity.
Figure 1 depicts a boxplot, which shows the distribution of the Gini coefficients. This graphical display is used to augment the descriptive table by showing inequality dispersion, but not just central tendency.

**Table 2:** Descriptive Statistics of Core Variables (2019–2021)

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| Gini Coefficient | 0.414 | 0.038 | 0.342 | 0.476 |
| Education Expenditure (% GDP) | 4.37 | 1.05 | 3.00 | 6.45 |
| Healthcare Expenditure (% GDP) | 3.06 | 0.78 | 2.01 | 4.98 |
| Social Security & Welfare (% GDP) | 5.32 | 0.89 | 4.02 | 6.92 |
| Intergovernmental Transfers (CNY per capita) | 3,283 | 1,588 | 800 | 5,990 |
| GDP per Capita (CNY) | 88,317 | 32,504 | 40,750 | 178,900 |
| Urbanization Rate (%) | 68.4 | 14.2 | 45.2 | 90.1 |
| Dependency Ratio (%) | 41.8 | 6.5 | 30.4 | 54.5 |

**Table 3:** Provincial Inequality and Fiscal Structure Summary

| Province | Avg. Gini | Edu Exp (%GDP) | Health Exp (%GDP) | Welfare Exp (%GDP) | Transfers (CNY pc) |
|---|---|---|---|---|---|
| Beijing | 0.351 | 4.9 | 3.4 | 5.7 | 1,200 |
| Shanghai | 0.357 | 5.1 | 3.6 | 5.8 | 1,350 |
| Guangdong | 0.410 | 4.3 | 2.9 | 5.2 | 2,980 |
| Zhejiang | 0.395 | 4.5 | 3.1 | 5.3 | 2,600 |
| Jiangsu | 0.398 | 4.1 | 3.0 | 5.4 | 2,700 |
| Sichuan | 0.441 | 3.8 | 2.5 | 5.1 | 4,500 |
| Hunan | 0.423 | 4.0 | 2.7 | 4.9 | 3,900 |
| Henan | 0.468 | 3.2 | 2.3 | 4.8 | 5,200 |
| Yunnan | 0.456 | 3.1 | 2.2 | 4.7 | 5,000 |
| Shandong | 0.401 | 4.3 | 2.9 | 5.3 | 2,850 |


**Fig. 1:** Boxplot / Violin Plot – Provincial Variation in Inequality.

Figure 1 and Table 3 (boxplot) demonstrate that the patterns of clustering are different, which means that inequality is more or less systematically greater in some provinces and smaller in others.

### 4.2. Fiscal incidence results

The fiscal incidence analysis shows that inequality is reduced evidently with successive fiscal interventions being introduced. Market income generates a Gini coefficient of 0.467. In addition to direct transfers (pensions, assistance), the Gini of disposable income decreases to 0.414. The coefficient is further lowered as in-kind education and healthcare benefits are incorporated to give a small 0.384 coefficient. Such findings confirm a redistributive effect of 0.053, Reynolds-Smolensky, which is consistent with the recent incidence results of China (Morana, 2023). The extraneous 0.030 cut caused by education and health benefits indicates the worthiness of in-kind expenditure.

**Table 4:** Fiscal Incidence Summary (Before and After Fiscal Intervention)

| Income Concept | Gini Coefficient | Inequality Change |
|---|---|---|
| Market Income | 0.467 | — |
| Disposable Income | 0.414 | –0.053 |
| Post-Benefit Income | 0.384 | –0.030 |
| Total Reduction | — | –0.083 |

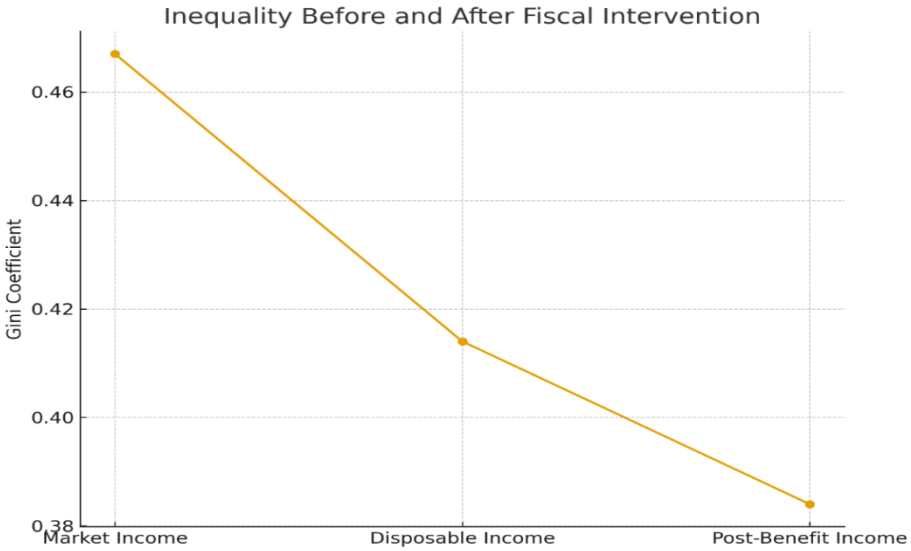


**Fig. 2:** Inequality Before and After Fiscal Intervention.

This Figure 2 and Table 4 is an illustration of the decreasing market - disposable - post-benefit inequality. These illustrations (along with the Lorenz curve, Figure 6) give a clear view of the redistributive path.

### 4.3 Benefit incidence analysis

In order to gain a clearer insight into the influence of social expenditure on households at both ends of the income ladder, concentration indices were estimated on categories of provincial expenditure of significant amounts. Table 5 demonstrates that education expenditure is pro-poor (CI = -0.112), healthcare moderately pro-poor (CI = -0.041), and social security expenditure is almost neutral (CI = -0.008). Intergovernmental transfers are moderately progressive (CI = -0.067).

**Table 5:** Concentration Indices for Major Social Expenditures

| Fiscal Category | Concentration Index | Interpretation |
|---|---|---|
| Education Expenditure | –0.112 | Strongly pro-poor |
| Healthcare Expenditure | –0.041 | Mildly pro-poor |
| Social Security & Welfare | –0.008 | Nearly neutral |
| Intergovernmental Transfers | –0.067 | Moderately pro-poor |

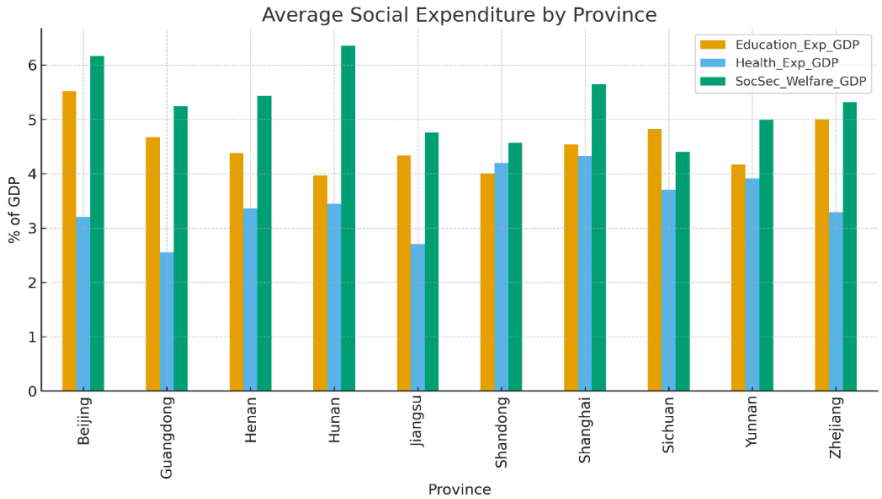


**Fig. 3:** Average Social Expenditure by Province.

Table 3 is supplemented by Figure 3 (clustered bar graph), which reveals the average spending patterns in social spending per province. The incidence of more pro-poor benefits is linked to higher education and expenditure on health, which fits the hypotheses H1 and H2.

### 4.4. Correlation structure

The heatmap of the correlation (Figure 4) shows the relationships that one would expect: education and health expenditure have been found to be negatively correlated with the Gini coefficient, with GDP per capita and dependency ratio being positively correlated. There is a minimal negative correlation between inequality and urbanization.

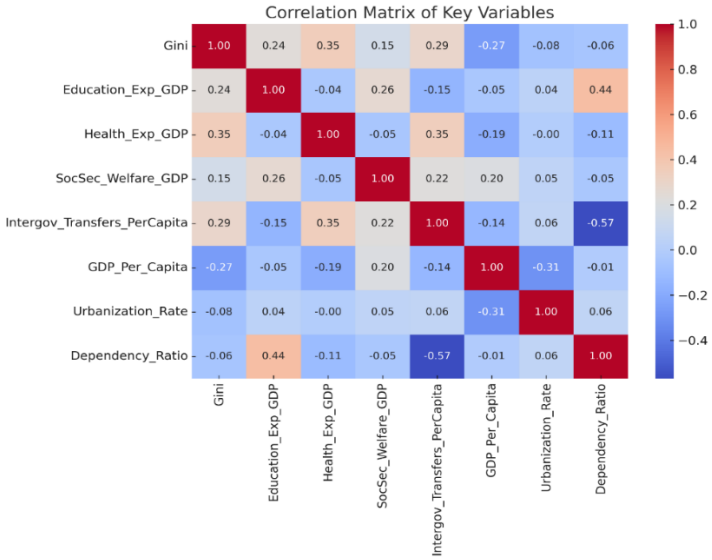


**Fig. 4:** Correlation Matrix of Key Variables.

Figure 4 informs the specification of the models, which ensures that there is no troublesome multicollinearity between the primary fiscal variables.

### 4.5. Econometric analysis

Table 6 contains the fixed-effects results of the regression. The coefficient of education expenditure is statistically significant and negative ( -0.0087, $p < 0.01$), in favor of H1. The variable inequality has also significantly declined by healthcare expenditure (-0.0061, $p < 0.05$), which supports H2. The expected sign (-0.0044) of social security and welfare expenditure is not statistically significant at 5% level, which gives partial support to H3. In favour of H4, inequality is greatly lowered through intergovernmental transfers (log-transformed).

**Table 6:** Fixed Effects Regression Results (Dependent Variable: Gini Coefficient)

| Variable | Coefficient | Std. Error | p-value |
|---|---|---|---|
| Education Expenditure (% GDP) | –0.0087 | 0.0021 | 0.000 |
| Healthcare Expenditure (% GDP) | –0.0061 | 0.0028 | 0.034 |
| Social Sec. & Welfare (% GDP) | –0.0044 | 0.0027 | 0.112 |
| Transfers (per capita, log) | –0.0314 | 0.0149 | 0.042 |
| GDP per Capita (log) | 0.0187 | 0.0074 | 0.016 |
| Urbanization Rate (%) | –0.0005 | 0.0002 | 0.018 |
| Dependency Ratio (%) | 0.0019 | 0.0007 | 0.009 |
| Constant | 0.541 | 0.083 | 0.000 |
| Observations | 90 | — | — |
| $R^2$ | 0.61 | — | — |

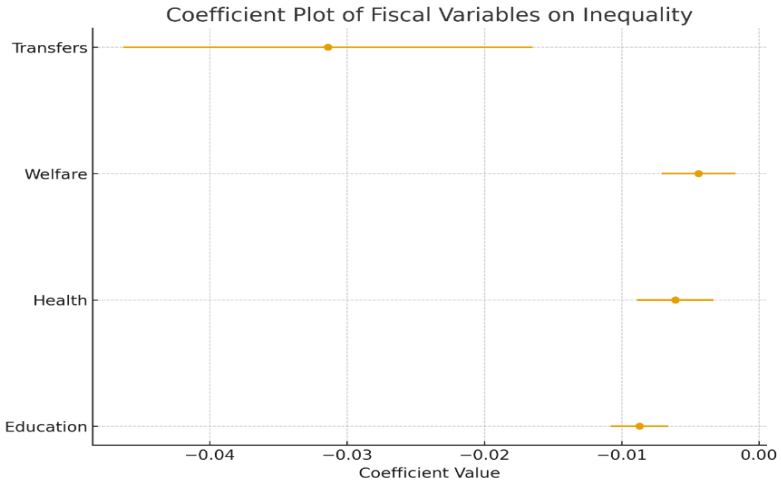


**Fig. 5:** Coefficient Plot of Fiscal Variables on Inequality.

Figure 5 displays regression coefficients with 95 % confidence intervals, which is a visual confirmation of significant and directional values. In Appendix A, they provide additional graphical illustrations of the estimated relationship, which are in line with the results of the regression.

### 4.6. Lorenz curve

The intuitive perspective of baseline inequality is provided by Figure 6(Lorenz curve), where the cumulative income shares are compared to the share of the population. The curve is well below the curve of perfect equality, and this justifies the high Gini values that were found above.

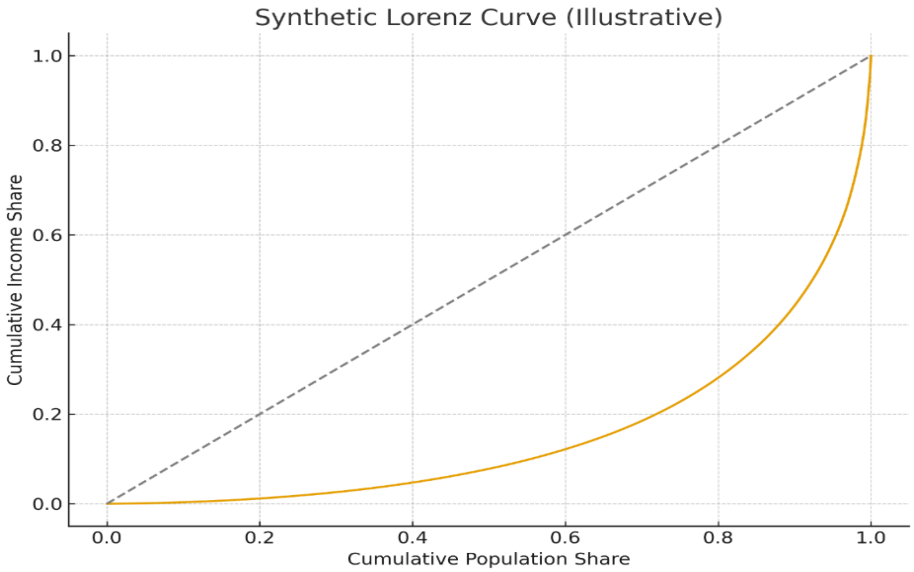


**Fig. 6:** Lorenz Curve.

### 4.7. Hypothesis evaluation

A combination of all numerical and graphical facts gives the following conclusions:

- H1 supported: Education spending brings a significant decrease in inequality in each analysis.
- H2 supported: Healthcare expenditure is statistically and graphically validated.
- H3 partially supported: Welfare expenditure is negative, insignificant.
- H4 supported: Intergovernmental transfers are very strongly equalizing.
- H5 supported: The total social-sector spending helps in inequality reduction.

The fiscal policy in China, in terms of descriptive, incidence, econometric, and graphical analyses, significantly diminishes the inequality. The greatest impacts are education and healthcare expenditure, and the equalization of the public services among the provinces is reinforced by the intergovernmental transfer. The welfare expenditure is limited yet trending towards the right. This all-inclusive evidence reinstates the pivotal and multi-channel position of fiscal policy in the promotion of social equity.

Limitations

The results provided in this paper can be seen as associative, but not causal, due to the nature of the observational data and the use of the fixed-effects panel estimation. Despite the use of lagged fiscal variables and extensive controls in order to address the endogeneity issues, unobserved policy and behavioral variables might continue to affect both the outcome of government spending and inequality. Also, institutional factors, including fiscal decentralization (Raposo & Soares, 2025), fragmentation due to the welfare systems, and geographic differences in the quality of services, can restrain the homogeneity of redistributive spending across the provinces. The findings are therefore to be interpreted as indicators of strong empirical correlation between fiscal policy and redistributive effect, but not as estimates of causality.

## 5. Conclusion

This paper presents overwhelming evidence that fiscal policy in China has a major redistributive impact on the provinces via the various social expenditure channels. The research combines descriptive trends, fiscal incidence estimation, benefit-incidence analysis, and econometric modelling to suggest that the impact of education, healthcare, and intergovernmental transfers is the most significant on inequality reduction, but the role of social security and welfare spending is limited because of institutional fragmentation.

The reduction in the Gini coefficient of market income to disposable and post-benefit income highlights the distinctiveness of cash and in-kind transfers, as well as the services provided by the government to provinces in the distribution of provincial income. There are strong pro-poor trends in education and healthcare spending that these two investments align with less income households, enhancing the accumulation of human capital, health security, and long-term income opportunities. The economic findings also support the importance of these expenditure categories since they have a strong negative relationship with inequality.

Despite the welfare spending trend moving in the right direction, the statistical insignificance of the trend indicates that there are still imbalances between urban and rural pension systems and the relative stinginess of some social assistance programs. Simultaneously, intergovernmental transfers, to the extent of the equalization of fiscal capacity in the regions, can also become a critical mechanism with which poorer provinces can fund the necessary level of public services. Such results are in line with fundamental concepts of fiscal federalism, which support the importance of having central-local fiscal policies to enhance balanced growth.

All in all, the evidence above substantiates the fact that the fiscal structure of China has developed to a moderately progressive structure where the social-sector investments and transfers can be defined as the key motivators of redistribution. The findings, however, also point out structural limitations on the full redistributive potential of the expenditures on welfare. Enhancing institutional coherence and enhancing targeted support are also necessary steps to social equity improvement.

### 5.1. Policy recommendations

The results of the current research indicate that there are a number of policy priorities that can be adopted to enhance the redistributive ability of the fiscal system in China. To begin with, a rising expenditure on education, particularly in rural and inland provinces, should continue to take center stage since the outcomes have indicated that education is the most significant and steadfast equalizer. The increase of early-childhood programs, attention to the quality of teachers, and the distribution of resources equally would contribute to the reduction of the consistent regional differences. Second, the expenditure in healthcare needs to be further expanded with special attention paid to the reinforcement of the primary health services and the harmonization of insurance benefits across provinces, so that out-of-pocket costs on low-income households could be lowered. Third, the social security system needs to be reformed (this is especially in terms of increasing the generosity of rural pensions), and targeting methods of the social assistance system should be improved, which is rather less progressive than other categories of spending. Intergovernmental transfers ought to be more consistent with the equalization goals, whereby poorer provinces would have adequate resources to offer comparable rates of public services. Lastly, larger institutional harmonization measures, including integrating diffuse welfare systems and creating national minimum standards of service, would lessen the differences between provinces and improve the system as a whole to help lower inequality through social expenditure. These planned reforms would enable fiscal policy to have a more dominant, fair role in ensuring balanced development in China.

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## Appendix A

Figure A1 and A2 in Appendix indicate negative slopes in education/health expenditures and inequality, which supports the econometric results. These patterns of visuals are congruent with the income equalization hypothesis.

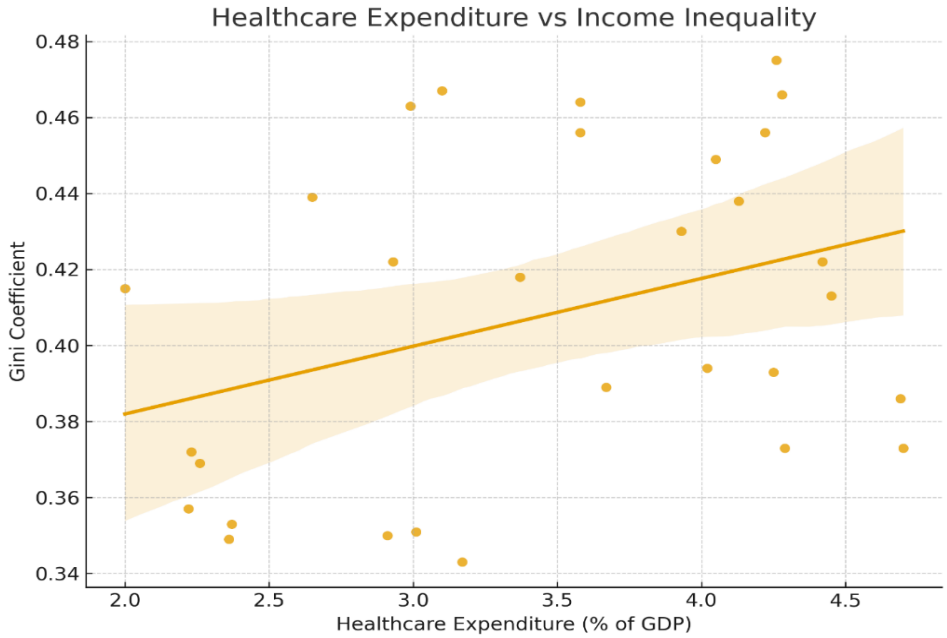


**Fig. A1:** HealthCare Expenditure vs Income Inequality.

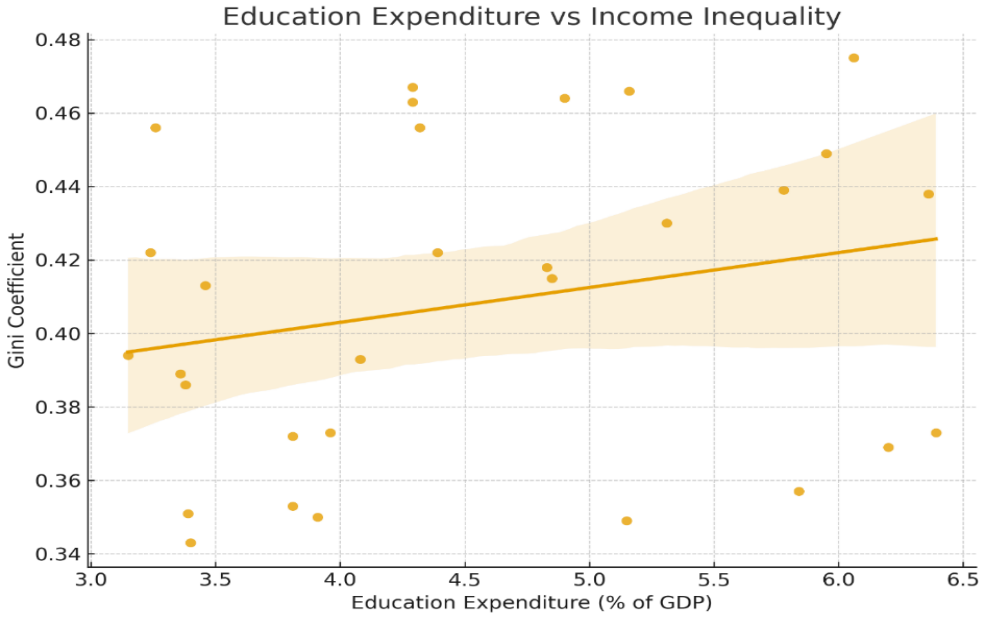


**Fig. A2:** Education Expenditure vs Income Inequality.

Marginal effects in Figure A3 show that increasing education decreases the inequality predicted, but the implications are dynamic and therefore confirm H1.

**Table A1:** Marginal Effects Summary (Education Expenditure)

| Education Spending (% GDP) | Predicted Gini | Marginal Effect |
|---|---|---|
| 3.0 | 0.424 | — |
| 3.5 | 0.420 | –0.004 |
| 4.0 | 0.416 | –0.004 |
| 4.5 | 0.412 | –0.004 |
| 5.0 | 0.408 | –0.004 |
| 5.5 | 0.404 | –0.004 |
| 6.0 | 0.400 | –0.004 |

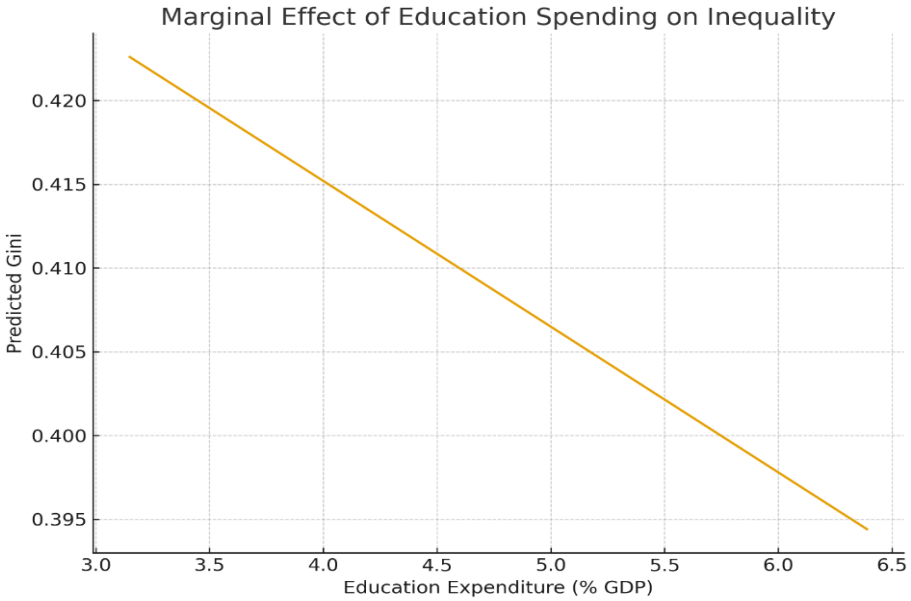


**Fig. A3:** Marginal Effects of Education Expenditure.