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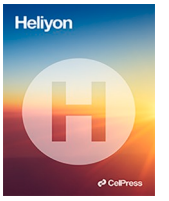

Research article

Research review for effects of investment on polarization of wealth

Donghun Yoon

Division of Economics, Kyonggi University, Suwon, 16227, South Korea

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ABSTRACT

In South Korea, the polarization of wealth is very serious, and its pace is faster than in other countries. Recently, investments in instruments such as stocks, bitcoins and in real estate are seen as decisive factors that intensify the polarization of wealth in South Korea. The motivation for this study is to analyze effects of investment on polarization of wealth. We carried out a study focused on the impact of investments on the polarization of wealth. In this study, we analyzed the effect of investment on the polarization of wealth. We studied the effect of real estate, stocks, and bitcoin on the polarization of wealth. We conducted multiple regression analysis on the income quintile share ratio, real estate, stocks, and bitcoins and then carry out multiple regression analysis with interest rates, household debt, incomes, and price indices. In order to analyze the investment impact on the polarization of wealth, the public data (2015–2020) from the government and institutions were utilized. Results showed that real estate, stocks, and bitcoins set as investment instruments in this study did not have a significant impact on the polarization of wealth. It is because the popularity of investments in real estates, stocks, and bitcoins in South Korea began in earnest from 2020, and has actually accelerated the polarization of wealth. This study has the theoretical contribution because the impact of investments on the polarization of wealth is analyzed, and policies for economic stability are discussed and presented. In addition, a new academic contribution of this study is to analyze the investment and polarization of wealth at the same time.

1. Introduction

In South Korea, the gap between the rich and the poor continues to grow significantly, and it is emerging as one serious economic and social problem for the entire country. Concerns over a prolonged gap between the financial market and the real economy continue to intensify. The gap between the real economy and the asset market is also very critical in South Korea. Polarization of wealth refers to a phenomenon in which the rich become richer and the poor become poorer in a winner takes all scenario. Polarization of wealth refers to a social phenomenon in which the economic inequality of income and assets intensifies across the country, preventing the lower class from maintaining its status as the middle class or raising its economic status to the middle class, while the poor increase in number. South Korea has gained the status of an advanced country with the development in politics, society, and culture through higher economic growth compared to major countries around the world. The UN, the IMF, the OECD, and the EU designated South Korea as an advanced country, and South Korea is affiliated with the DAC and the Paris club. In South Korea, the gap between the rich and the poor continues to intensify, and income inequality, which the people feel the most, is the biggest problem. In the 2010s, South

E-mail address: nature@kyonggi.ac.kr.

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Korea faced limitations in its manufacturing-based strategy that pushed economic growth, which subsequently led to low economic growth. As a result, problems such as income imbalance, unemployment, aging, and low birth rate occurred, contributing to the collapse of the middle class. In this study, we focused on investments in relation to the polarization of wealth in South Korea. We sought to analyze the impact of investments on the polarization of wealth in South Korea and to present economic policies. Recently, investment in real estate, stocks, and bitcoins is expected to have a significant impact on the polarization of wealth in South Korea. Despite the COVID-19 pandemic, prices of real estates, stocks, and bitcoins have risen abnormally in South Korea. With many people investing excessively or investing through loans, it has become a serious social and economic problem in South Korea, and very strict national regulations have been implemented regarding real estate investments. Therefore, the wealth of the rich people continues to increase significantly. Investment as defined is an increase in the newly generated capital stock as a result of production activities for a certain period of time, and speculation is a transaction aimed at obtaining profits in anticipation of market price fluctuations. Speculation is included in the overall quantitative index for investment, but it is practically very difficult to classify the figure for speculation in the quantitative index of investment. Expansionary fiscal adjustments are particularly important to promote changes in the income distribution [1]. Higher employment and low inflation rate decrease the inequality level [2]. The motivation for this study is to analyze effects of investment on polarization of wealth. This study has a difference in studying wealth polarization and assets compared to existing literature in the literature review. The research gap in the existing literature is a lack of research analysis and discussion on economic policies on the ever-expanding polarization of wealth. Existing studies can be found in the literature review. In this study, a study is discussed and presented to resolve the research gap, focusing on investment in real estate, stocks, and bitcoins. Research on the polarization of wealth and investment in financial and real assets can make new academic contributions. In this study, we focused on real estate, stocks, and bitcoins, which are investments that influence the polarization of wealth. We analyzed the impact of investment on the polarization of wealth in South Korea. We discuss and present economic policies to solve the polarization of wealth based on the analysis results. Overall results of multiple regression analysis showed that real estate, stocks, and bitcoins set as the investment instruments in this study did not have a significant impact on the polarization of wealth. This is because the popularity of real estate, stocks, and bitcoins in South Korea began in earnest in 2020. This study has novelty in economic policies for improvement measures. This study has the theoretical contribution because the impact of investments on the polarization of wealth is analyzed, and policies for economic stability are discussed and presented. The new academic contribution of this study is to analyze the investment and polarization of wealth at the same time. We hope that this study can contribute in solving the polarization of wealth and stabilize the national economy. This paper consists of the introduction, literature review, discussion on increased polarization of wealth, economic problems in South Korea, research methodology design for analysis, research results and interpretation, research discussion and proposed economic policy, and conclusions and future research.

2. Literature review

The Gini index is a summary statistic that measures how equitably a resource is distributed in a population; income is a primary example [3]. Income distribution plays a more important role than might be traditionally acknowledged in poverty reduction, though this importance varies widely across regions and countries [4]. The Inequality Process (IP) and the Saved Wealth Model (SW) are theories of income distribution [5]. Our main finding is that more inequality amongst the wealthiest is associated with higher economic growth [6]. The current financial turbulence in Europe inspires and perhaps requires researchers to rethink how to measure incomes, wealth, and other parameters of interest to policy-makers and others [7]. One issue that has attracted considerable attention recently among scholars interested in inequality and conflict is polarization [8]. Savings and wealth accumulation are important dimensions of policy and research debates [9]. Global income inequality—the sum of inequality within and between nations—is massive today, the legacy of uneven growth in the world's regions since the advent of the industrial revolution [10]. The distribution of wealth is central for evaluating social justice in a country [11]. Financial globalization leads consumption and income inequality to diverge, and the divergence is more extreme if lower-income groups have higher debt ratios [12]. Regulation is linked to income inequality as well, whereas legal system and sound money have no significant effects on income distribution [13]. Household debt only responds to positive changes in income inequality, while there is no evidence of falling inequality significantly affecting household debt [14]. While some kinds of inequality, caused by differential rewards to effort, might be associated with faster economic growth, other kinds, arising from unequal opportunities for investment, might be detrimental to economic progress [15]. The high level of debt among households outside the top end of the income distribution has led many economists to assert that household debt has been an important component of the increase in income inequality in the United States [16]. A virtuous cycle of credits, a shorter technological gap, less inequality, and economic growth is feasible to be created when there is full liquidity in the market [17]. ICT growth may exacerbate inequality due to differential access and skill premiums [18]. Economic well-being and economic inequality are usually quantified using income measurements of various sorts [19]. The growing labor market inequality and rising intergenerational divides amplifying the importance of parental resources [20]. Income inequality rises with financial development initially and then drops [21]. The political and institutional determinants that affect income inequality have no short- or long-run effects on the wealth-to-income ratio [22]. The inflation rate has ambiguous effects on income inequality, implying that the effects could be affected by another variable [23]. Many scholars argue that entrepreneurship concentrates wealth not only because rich families choose entrepreneurial occupations more often but also because entrepreneurs tend to earn and save more income than workers [24]. While national inequality has made headlines in recent years, income is far more unequally distributed globally than it is within any state [25]. The Gini index is widely used in economics as a measure of inequality with respect to income or wealth [26]. Wealth taxes are redistributive policies, which tap into the accumulation of wealth at the top [27]. It is well documented that inward FDI promotes economic growth and technological progress which are demonstrated to affect income inequality [28]. Technological progress,

globalization, deregulation and market-oriented reform, and financialization have generated many new opportunities, but rewarded capital more than labor, benefited skilled workers more than the unskilled, widened spatial inequality, and produced a growing number of the superrich. For some countries, population aging has also contributed to rising inequality [29]. We need to invent modern tax systems adapted to the reality of the 21st century: the growing importance of capital and the rise of inequality [30]. The research gap in the literature review is a lack of research analysis and discussion on economic policies on the ever-expanding polarization of wealth. In this study, we attempted a study to resolve the research gap, focusing on investment in real estate, stocks, and bitcoins.

3. Current trends in polarization of wealth

Polarization of wealth is referred to as the economic inequality or the gap between the rich and the poor. It also refers to the material and economic inequality between classes caused by the incorrect distribution or the redistribution of economic assets and incomes between individuals. Polarization of wealth refers to the collapse of the middle class throughout the country and an increase in the low-income and high-income bracket. This phenomenon has a negative impact on the national economy overall. The perception of inequality is a subjective emotion arising from the gap between the equality principle and the practical inequality, and refers to a relative sense of deprivation for various social opportunities that can be exercised in everyday life. Therefore, the perception of inequality reflects the objective characteristics of the reality from an individual's subjective point of the view. If the level of inequality is serious, the social conflict and political unrest intensify, hindering economic growth. Income inequality is an inevitable problem in the capitalist economy, and refers to the material and economic inequality between classes caused by different factors from each individual's characteristics in the process of distributing individual assets and incomes. Income inequality can further accelerate the polarization of wealth even in countries with stable economic structures. The recent COVID-19 pandemic has hit the low-income bracket even harder worldwide, increasing the gap between the rich and the poor. Professor Daron Acemoglu of MIT argues that the inclusive system is the key to economic growth, but inequality hinders its development [31]. Economists argue that if inequality between wealth and income deepens when the financial market is not perfect, human capital and productivity growth across the national economy will slow down. Economic demand and employment do not increase because the consumption level of the top class does not rise in proportion to the income level. Therefore, it does not become an economic virtuous cycle in which the economic level rises and subsequently lead to an economic downturn. The OECD uses the inter-decile ratio P90/P10 as a major indicator of the income inequality of each country. This means that the higher the magnification, the higher the income inequality. The current status of the income inequality in major OECD countries for the inter-decile ratio P90/P10 is presented in Fig. 1. The poverty rate in major OECD countries is shown in Fig. 2.

4. Economic problems in South Korea

In South Korea, the debate on fairness in society has become the biggest topic and is the subject of discussion by the entire nation. The South Korean government has proposed a new paradigm of income-led growth that improves income inequality and promotes economic growth. Income-led growth in South Korea is based on wage-led growth that promotes economic growth by increasing wages and household income. South Korea is experiencing economic difficulties including low economic growth and increase in inequality. In South Korea, income inequality, polarization of wealth, and opportunity inequality continue to increase, causing social conflict and anxiety. In South Korea, the polarization of wealth is the biggest social problem and is causing social anxiety, incompatibility, and hostility. Recently, investment in real estate, stocks, and bitcoins is seen as a decisive factor in widening the gap between the rich and

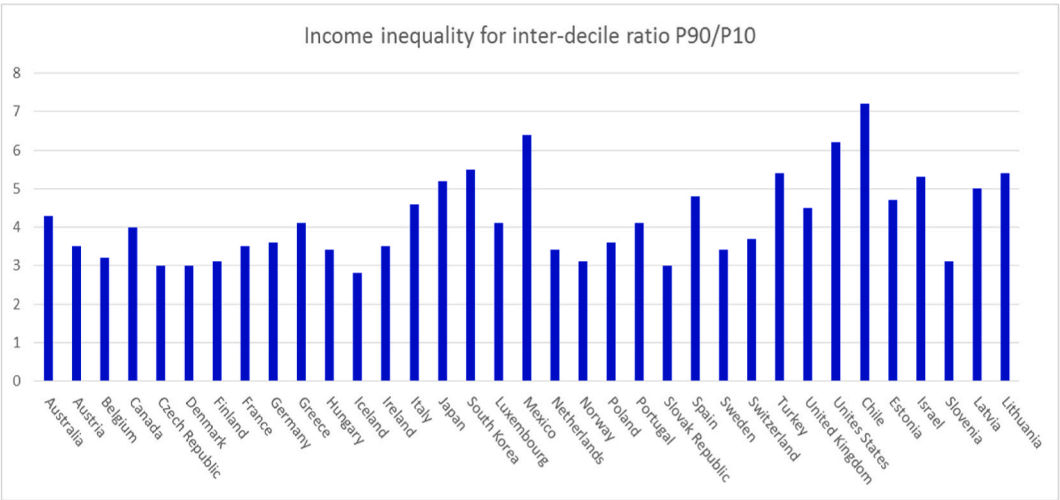

Fig. 1. The current status of the income inequality in major OECD countries for the inter-decile ratio P90/P10.
Source. "Income inequality for the inter-decile ratio P90/P10" (2021), OECD.

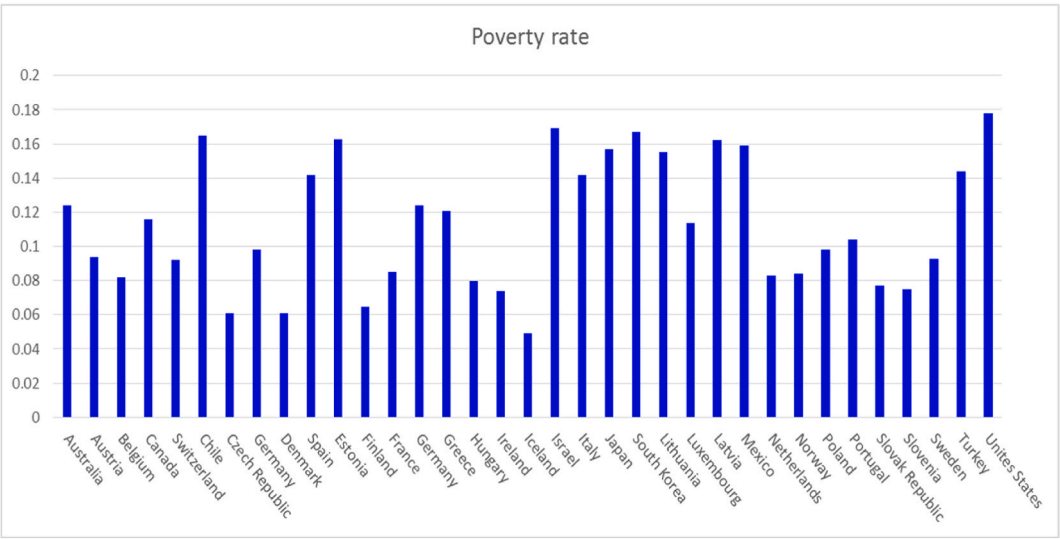

Fig. 2. The poverty rate in major OECD countries.
Source. "Poverty rate" (2021), OECD.

the poor in South Korea. The intensifying polarization of wealth can be seen as a key cause of the disappearance of the ladder for class movement. Polarization of wealth is occurring in most major countries around the world, but in South Korea, the rate is faster than in other countries. In South Korea, conflicts between the classes are intensifying, and the polarization of wealth that the general public feels is very serious. In South Korea, due to the COVID-19 pandemic, household income has stagnated, especially among low-income families, and the overall household consumption expenditure has decreased. It is also predicted that the prolonged COVID-19 pandemic will have a negative impact on economic revitalization and brings about overall economic downturn. The South Korean government is promoting economic support policies and economic stimulus measures to cope with it. The government is also striving to revitalize private consumption by expanding fiscal expenditure through income increase policies and welfare expansion policies. This means that the South Korean government promotes policies to boost private consumption and revitalize the domestic economy by increasing household income. In the fairness awareness survey of the Seoul Metropolitan Government (2020), we can see how Seoul citizens perceive income inequality as shown in Fig. 3. The survey results on income inequality outlook of Seoul Metropolitan Government (2020) are presented in Fig. 4.

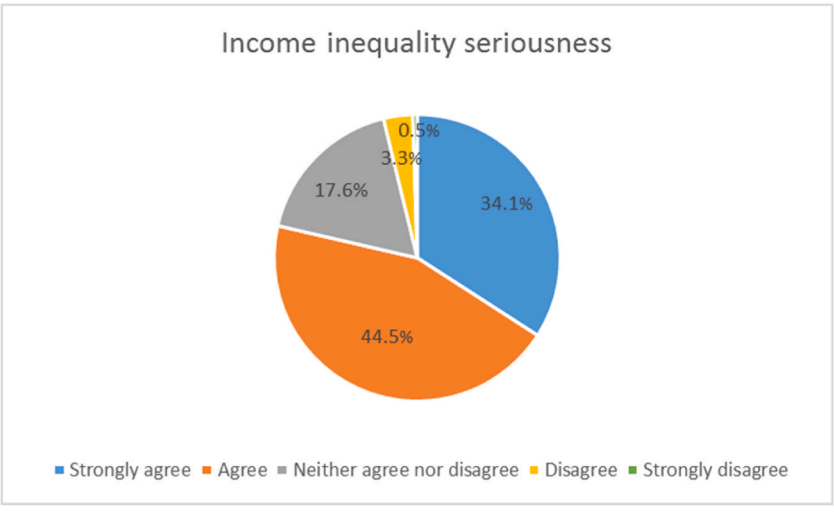

Fig. 3. The survey result on the income inequality seriousness of Seoul Metropolitan Government (2020).
Source. "Income inequality seriousness" (2021), Seoul Metropolitan Government.

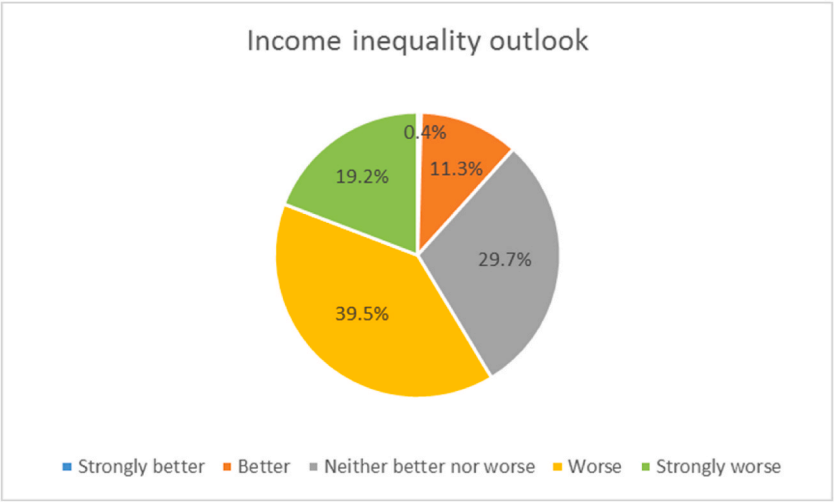

Fig. 4. The survey results on income inequality outlook of Seoul Metropolitan Government (2020).
Source. "Income inequality outlook" (2021), Seoul Metropolitan Government.

5. Research methodology design for analysis

This study sought to conduct research that contributes to resolving the polarization of wealth in South Korea and stabilize the national economy. We have recently noted investments as a major factor influencing the polarization of wealth in South Korea. Major investments in South Korea involve real estate, stocks, and bitcoins, which have been on the rise. We believe that investments have accelerated the polarization of wealth. In this study, the income quintile share ratio is used as the income inequality index. The Gini coefficient is well-known, but the income quintile share ratio is actually used more. Therefore, this study uses the income quintile share ratio of the household trend survey data (2021) by the Statistics Korea. This study analyzes the effects of real estate, stocks, and bitcoins on the polarization of wealth. It is focused on the investment while designing research methods. For the data on real estate in this study, Seoul housing prices data (2015–2020) of the Korea Real Estate Board are used. The KOSPI index (2015–2020) of the Korea Exchange is used for stock data, and the bitcoin price (2015–2020) of the Tokenpost is used for the bitcoin data. In order to analyze the investment impact on the polarization of wealth, we conduct multiple regression analysis on the income quintile share ratio, real estate, stocks, and bitcoins. We set the income quintile share ratio as the dependent variable and real estate, stocks, and bitcoin as the independent variables. We conduct multiple regression analysis on the income quintile share ratio, real estate, stocks, and bitcoins, and then carry out multiple regression analysis with interest rates, household debt, incomes, and price indices that directly affect the polarization of wealth. Regression analysis is a statistical tool used for the investigation of relationships between variables [32]. At the core of multivariate statistics is the investigation of relationships between different sets of variables. More precisely, the inter-variable relationships and the causal relationships [33]. General social phenomena are rarely explained or predicted by one variable. Therefore, a model is needed to more effectively and accurately explain and predict the variance of the dependent variable using two or more independent variables. Regression analysis using two or more independent variables is multiple regression analysis. In this study, we intend to accurately analyze the effect through multiple regression analysis. Through the research results, problems are accurately identified and efficient solutions are suggested. The improvement measures and economic policy measures suggested in this study are expected to make an academic contribution. This study uses the Bank of Korea' s benchmark interest rate data (2015–2020), the Bank of Korea's household debt data (2015–2020), the household debt data (2015–2020), the Statistics Korea's a per capita GDP (2015–2020), and the Statistics Korea's the consumer price index (2015–2020) as data. We set real estate, stocks, and bitcoins as dependent variables and interest rates, household debts, incomes, and price indices as the independent variables.

In this paper, the hypothesis regarding the polarization of wealth in South Korea is as follows.

Hypothesis. Investments will influence the polarization of wealth in South Korea.

- Hypothesis 1: Real estate will influence the polarization of wealth in South Korea.
- Hypothesis 2: Stocks will influence the polarization of wealth in South Korea.
- Hypothesis 3: Bitcoins will influence the polarization of wealth in South Korea.

In this paper, the hypothesis regarding investments, interest rate, household debt, income, and price index in South Korea is as follows.

Hypothesis. Investments will influence the interest rate, household debt, income, and price index in South Korea.

- Hypothesis 1: Real estate will influence the interest rate, household debt, income, and price index in South Korea.

· Hypothesis 2: Stocks will influence the interest rate, household debt, income, and price index in South Korea.
· Hypothesis 3: Bitcoins will influence the interest rate, household debt, income, and price index in South Korea.

6. Research results and interpretation

In this study, we noted investment as a factor influencing the polarization of wealth. We analyzed the effects of real estate, stocks, and bitcoins on the polarization of wealth in South Korea. Recently, investment in real estate, stocks, and bitcoins has soared in South Korea, which is believed to have accelerated the polarization of wealth. First, we conducted multiple regression analysis on the income quintile share ratio, real estate, stocks, and bitcoins. We set the income quintile share ratio as the dependent variable and real estate, stocks, and bitcoins as the independent variables. We first plotted the data and identified the form. In the fitted line plot, we derive that the income quintile share ratio increases as housing prices and bitcoin prices increase in South Korea. In the fitted line plot, the KOSPI index did not appear to have a significant impact on the increase in the income quintile share ratio. The fitted line plot for the income quintile share ratio and investment is shown in Fig. 5.

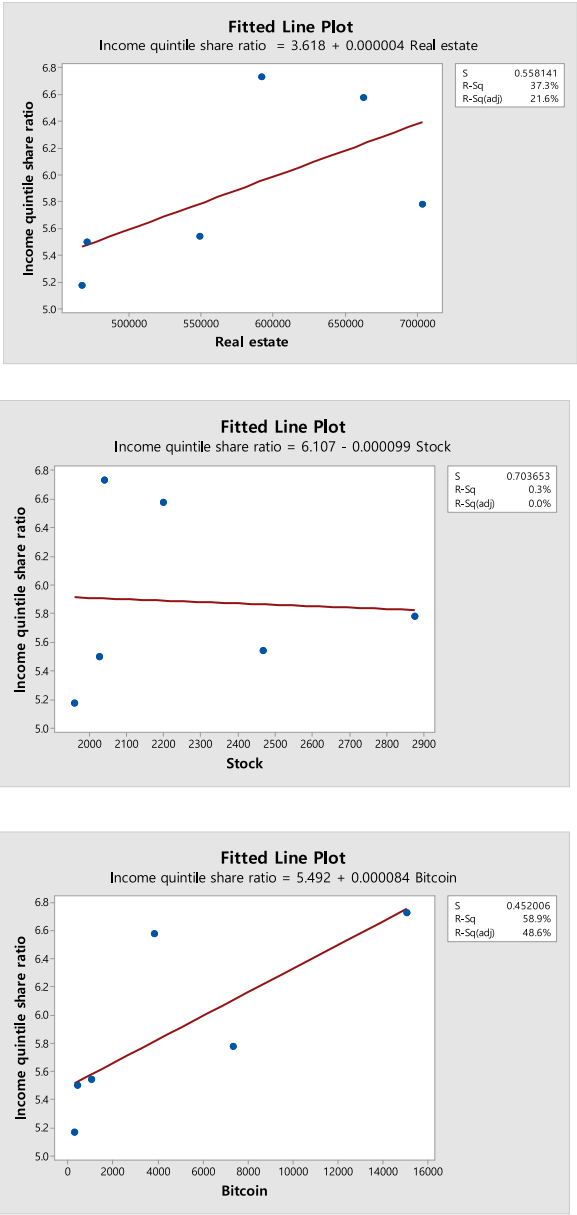

Fig. 5. The fitted line plot for the income quintile share ratio and investment.

In the coefficient, the p-values of real estate, stock, and bitcoin are 0.128, 0.147, and 0.369, respectively, all of which are not statistically significant at 0.05 significance level. In the variance analysis, the p-value was 0.139. The regression equation was not statistically significant at the 0.05 significance level. The regression analysis for the income quintile share ratio and investment is presented in Table 1.

When the significance level is 0.05 in the normality test for the income quintile share ratio and investment is 0.05, the p-value is 0.476. Therefore, the residual follows the normal distribution. The normality test for the income quintile share ratio and investment is described in Fig. 6. The surface plot and the contour plot for the income quintile share ratio and investment is presented in Fig. 7.

In this study, we conducted multiple regression analysis on the real estate, interest rate, household debt, income, and price index. We set real estate as the dependent variable and the interest rate, household debt, income, and price index as the independent variables. In the coefficient, the p-values of the interest rate, household debt, income, and price index are 0.398, 0.474, 0.213, and 0.900, respectively, all of which are not statistically significant at 0.05 significance level. In the variance analysis, the p-value was 0.115. The regression equation was not statistically significant at the significance level of 0.05. The regression analysis for the real estate, interest rate, household debt, income, and price index is presented in Table 2.

In the analysis result, when the significance level is 0.05 in the normality test for the real estate, interest rate, household debt, income, and price index are 0.05, the p-value is 0.318. Therefore, the residual follows the normal distribution. The normality test for the real estate, interest rate, household debt, income, and price index is described in Fig. 8.

We set the stock as the dependent variable and the interest rate, household debt, income, and price index as the independent variables. In the coefficient, the p-values of the interest rate, household debt, income, and price index are 0.760, 0.606, 0.896, and 0.626, respectively, all of which are not statistically significant at 0.05 significance level. The variance analysis showed the p-value was 0.634. It was analyzed that the regression equation was not statistically significant at 0.05 significance level. The regression analysis for the stocks, interest rate, household debt, income, and price index is presented in Table 3.

When the significance level is 0.05 in the normality test for the stock, the interest rate, household debt, income, and price index are at 0.05, the p-value is 0.318. Therefore, the residual follows the normal distribution. The normality test for the stock, interest rate, household debt, income, and price index is described in Fig. 9.

We set the bitcoin as the dependent variable and the interest rate, household debt, income, and price index as the independent variables. In the coefficient, results showed the p-values of the interest rate, household debt, income, and price index are 0.560, 0.569, 0.935, and 0.574, respectively, all of which are not statistically significant at the significance level of 0.05. In the variance analysis, the p-value was 0.612. The regression equation was not statistically significant at the significance level of 0.05. Results of the regression analysis for the bitcoin, interest rate, household debt, income, and price index are presented in Table 4.

When the significance level is 0.05 in the normality test for the bitcoin, the interest rate, household debt, income, and price index are 0.05, and the p-value is 0.318. Therefore, the residual follows the normal distribution. The normality test for the bitcoin, interest rate, household debt, income, and price index is described in Fig. 10.

Results of the multiple regression analysis showed that real estate, stocks, and bitcoins set as investment instruments in this study did not have a significant impact on the polarization of wealth. This is because the popularity of investments in real estates, stocks, and bitcoins in South Korea began in earnest from 2020, and has actually accelerated the polarization of wealth. It can be interpreted as a result of people paying more taxes in proportion to investments since higher profits are gained through the investments. It can also be seen as the influence of most people's active participation in investments, regardless of whether they have considerable property or not. Therefore, investments in real estate, stocks, and bitcoins are expected to have a significant influence on the recent polarization of

Table 1
The regression analysis for the income quintile share ratio and investment.
Regression Analysis: Income quintile share ratio versus Real estate, Stock, Bitcoin.

Source	DF	Analysis of Variance	
		F-Value	P-Value
Regression	3	6.37	0.139
Real estate	1	6.33	0.128
Stock	1	5.36	0.147
Bitcoin	1	1.32	0.369
Error	2		
Total	5		

S	R-sq	Model Summary	
		R-sq (adj)	R-sq (pred)
0.306791	90.52%	76.31%	0.00%

Term	Coef	SE Coef	Coefficients		
			T-Value	P-Value	VIF
Constant	5.222	0.947	5.51	0.031	
Real estate	0.000006	0.000003	2.52	0.138	3.34
Stock	−0.001425	0.000616	−2.31	0.147	2.48
Bitcoin	0.000036	0.000031	1.15	0.369	1.69

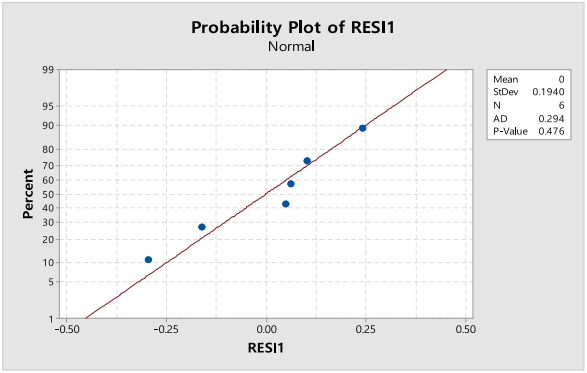

Fig. 6. The normality test for the income quintile share ratio and investment.

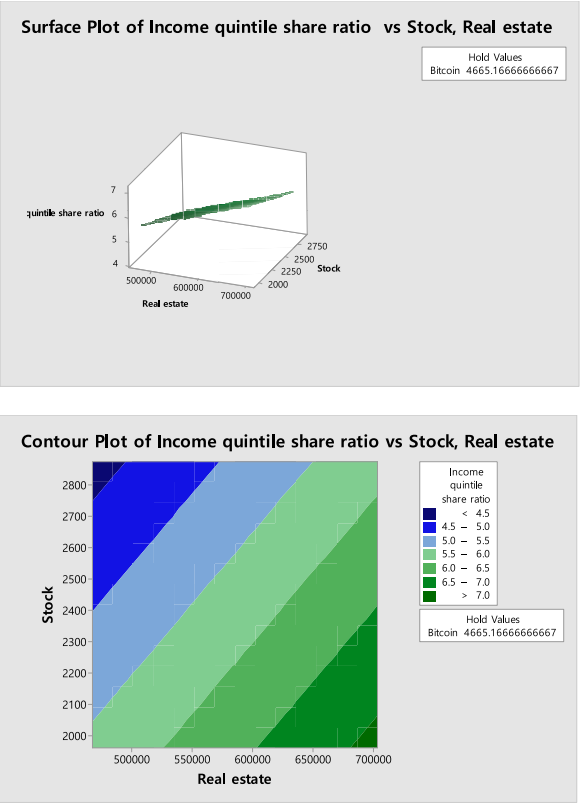

Fig. 7. The surface plot and the contour plot for the income quintile share ratio and investment.

wealth in South Korea. In future research, analyzing data on real estate, stocks, and bitcoins for at least five years from 2020 will better explain the polarization of wealth in South Korea.

7. Research and discussion

Real estate, stocks, and bitcoins set as investment instruments in this study did not have a significant impact on the polarization of wealth. Compared to what was discussed in the literature review, the results of this study analyzed that investment instruments as real assets and financial assets did not significantly affect the polarization of wealth. These did not have a significant impact on the polarization of wealth in reality because real estate, stocks, and bitcoin did not rise significantly during the period (2015–2020). The limitations of this study did not reflect the economic stimulus for COVID-19 and global the liquidity expansion from 2020. Economic development and economic growth are very important in the national economy. In addition to economic concerns, political, institutional, environmental, and welfare issues can also be improved through economic development and growth. The polarization of

Table 2
The regression analysis for the real estate, interest rate, household debt, income, and price index.
Regression Analysis: Real estate versus Interest rate, Household debt, Income, Price index.

Source	DF	Analysis of Variance	
		F-Value	P-Value
Regression	4	42.26	0.115
Interest rate	1	1.92	0.398
Household debt	1	1.18	0.474
Income	1	8.27	0.213
Price index	1	0.02	0.900
Error	1		
Total	5		

S	R-sq	Model Summary	
		R-sq (adj)	R-sq (pred)
16724.1	99.41%	97.06%	0.00%

Term	Coef	SE Coef	Coefficients		
			T-Value	P-Value	VIF
Constant	−346664	4,918,684	−0.07	0.955	
Interest rate	330151	238079	1.39	0.398	35.89
Household debt	898	828	1.08	0.474	373.24
Income	−57.0	19.8	−2.88	0.213	21.92
Price index	9335	59127	0.16	0.900	306.84

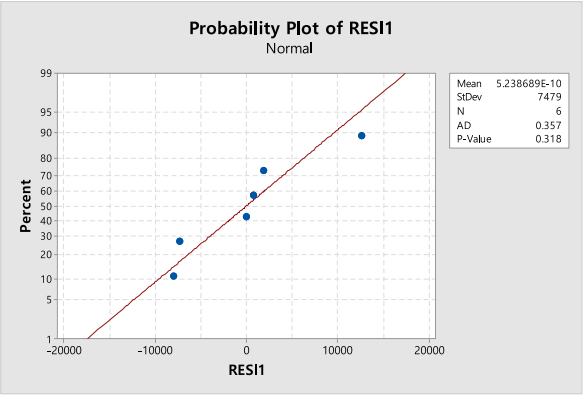

Fig. 8. The normality test for the real estate, interest rate, household debt, income, and price index.

wealth is a global trend and a very important economic issue. In general, it is meaningless to simply reduce the relative gap in wealth since an appropriate level of economic growth has been reached. The polarization of wealth across the country can adversely affect the economy as a whole. If wealth is concentrated in the upper class and the purchasing power of the middle class weakens, an economic recession may occur. This is because the consumption level of the top class does not rise in proportion to the level of wealth, so the increase in consumption of the top class alone cannot lead to a virtuous cycle of raising the standard of living by increasing jobs. This means that the consumption of the top class is slightly increased and the purchasing power of the middle class is greatly reduced. Increasing the socio-political instability towing to income inequality can undermine economic growth and economic welfare. The polarization of wealth can dampen consumption, causing an economic downturn, and hinder economic development and the economic growth. As economic inequality continues to rise, there is increased concern about both the consequences of inequality and what can be done to reverse this trend [34]. The establishment of inequality came with humanity's adopting an artificial economics, based on private property and the division of wealth and labour [35]. If countries struggle to transition from growth strategies that are effective at low income levels to growth strategies that are effective at high income levels, they may stagnate at some middle-income level [36]. South Korea has been striving in various ways in pursuit of economic development and economic growth as a government-led economic development policy. South Korea's rapid economic growth has improved the quality of the life for the whole country, raised income levels, and gave rise to successful economic development policies, but serious economic and social problems have also emerged due to deepening polarization of wealth. In South Korea, conflicts between classes are intensifying due to the polarization of wealth, and the degree of polarization of wealth felt by the general public is more serious than the actual indicators. Along with difficulties brought about by the COVID-19 pandemic, South Korean economy has recently entered an era of low economic growth that is lower than the average economic growth rate of countries around the world. In this situation, the South Korean government is actively

Table 3
The regression analysis for the stocks, interest rate, household debt, income, and price index.
Regression Analysis: Stock versus Interest rate, Household debt, Income, Price index.

Source	DF	Analysis of Variance	
		F-Value	P-Value
Regression	4	0.96	0.634
Interest rate	1	0.16	0.760
Household debt	1	0.51	0.606
Income	1	0.03	0.896
Price index	1	0.44	0.626
Error	1		
Total	5		

S	R-sq	Model Summary	
		R-sq (adj)	R-sq (pred)
356.180	79.37%	0.00%	0.00%

Term	Coef	SE Coef	Coefficients		
			T-Value	P-Value	VIF
Constant	70436	104755	0.67	0.623	
Interest rate	2004	5070	0.40	0.760	35.89
Household debt	12.5	17.6	0.71	0.606	373.24
Income	−0.069	0.422	−0.16	0.896	21.92
Price index	−838	1259	−0.67	0.626	306.84

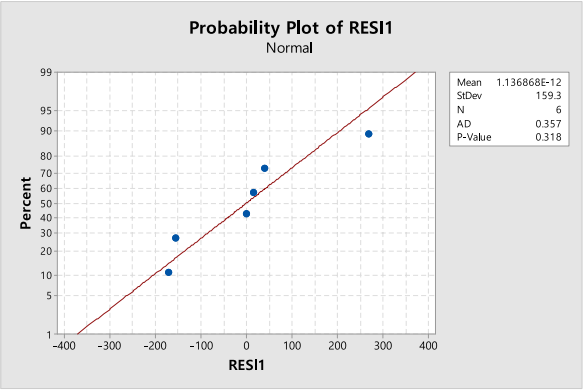

Fig. 9. The normality test for the stock, interest rate, household debt, income, and price index.

making efforts to restore the level of economic growth through various redistribution policies. As the polarization of wealth intensified despite the economic growth, the people's interest in their level of wealth and the distribution status of wealth throughout the country increased significantly. After the global financial crisis, policymakers from international organizations and countries around the world have suggested inclusive growth as a major agenda, in which inequality is improved and growth outcomes are widely shared. The South Korean government is actively striving to promote aggregate demand and economic growth by increasing wages and household income through income-led growth. The South Korean government also implemented the expansion of the minimum wage system, the labor incentive tax system, the reduction of the burden for medical expenses, and the expansion of the basic pension and the employment insurance. South Korea is implementing policies to expand household income, reduce household spending, and expand the social safety net. South Korea's function of income redistribution is much weaker than that of other advanced countries. It is essential to expand pensions for the poor elderly and expand social welfare and safety nets to support low-income families. It is also necessary to strengthen progressive taxation such as income tax increases not only for the highest income class but also for the middle and upper income class. In South Korea, the inequality in the international disposable income standard is considered serious because of the redistribution function. The inequality in market income is also high. In particular, the market income inequality can be attributed to the high wage gap between large companies and SMEs, regular and non-regular workers. Therefore, it is necessary to implement policies to overcome the structure and gap of the market by establishing the equal wage system for the same labor or fair competition. The nation is currently facing a health crisis and an economic crisis caused by the COVID-19 pandemic. In particular, the COVID-19 pandemic is putting the economy in a dangerous situation that could lead to the Great Depression. Countries around the world are actively responding to the economic crisis with huge fiscal expenditures and stimulus measures through unlimited quantitative easing to overcome the COVID-19 pandemic, but there are also concerns that such economic measures may intensify polarization of wealth. In

Table 4
The regression analysis for the bitcoin, interest rate, household debt, income, and price index.
Regression Analysis: Stock versus Interest rate, Household debt, Income, Price index.

Analysis of Variance					
Source	DF		F-Value		P-Value
Regression	4		1.07		0.612
Interest rate	1		0.69		0.560
Household debt	1		0.65		0.569
Income	1		0.01		0.935
Price index	1		0.63		0.574
Error	1				
Total	5				
Model Summary					
S	R-sq		R-sq (adj)		R-sq (pred)
5615.99	81.06%		5.28%		0.00%
Coefficients					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	1,237,195	1,651,705	0.75	0.591	
Interest rate	66218	79947	0.83	0.560	35.89
Household debt	224	278	0.80	0.569	373.24
Income	−0.68	6.66	−0.10	0.935	21.92
Price index	−15707	19855	−0.79	0.574	306.84

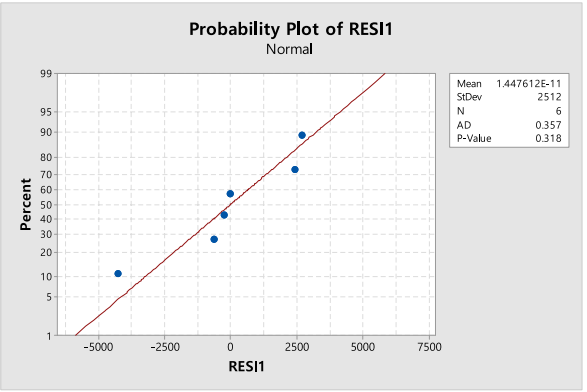

Fig. 10. The normality test for the bitcoin, interest rate, household debt, income, and price index.

this situation, the role of the government is very important. It is necessary to introduce policies that consider the distribution and redistribution to enable the fair and equal social construction and economic growth. In 2020, the investment craze for real estate, stocks, and bitcoins in South Korea began to rise significantly. Contrary to the expectation that the economy will stagnate due to the COVID-19 pandemic, real estate, stocks, and bitcoins have grown significantly in South Korea. The investment craze for real estate, stocks, and bitcoins, regardless of whether investors have considerable property or not, has actually resulted in a much higher return from investment than from labor or productivity, reducing the people's willingness to work and strengthening their willingness to invest. This caused serious social and economic problems and is expected to further accelerate polarization of wealth. It is a desirable phenomenon to revitalize the economy and make profits through the investment. However, there is an urgent need for the government to prepare regulations and systems to prevent speculation. Existing studies are a lack of research analysis and discussion on economic policies on the polarization of wealth. In this study, a study is discussed and presented to resolve the polarization of wealth, focusing on investment in real estate, stocks, and bitcoins. Research on the polarization of wealth and investment in financial and real assets can make new academic contributions. In this study, the influence of investments in the polarization of wealth was the subject of research because real estate, stocks, and bitcoins in South Korea are very likely to cause serious economic and social problems across the country and adversely affect the national economy. Therefore, we analyzed the impact of investments on the polarization of wealth and discussed research and economic policies with an emphasis on real estate, stocks, and bitcoins. From these results, it can be seen that investments have a very important influence on the polarization of wealth and on economic stabilization.

8. Conclusion and policy implications

8.1. Conclusion

In a world where financial capital serves as the backbone of individual and societal economic health, understanding the mechanisms that can stimulate or hinder its accumulation is critical [37]. The distribution of wealth will be nudged towards taking the shape, the probit, with its very unequal allocation. The larger these random costs and benefits are and the more frequently they occur, the more severe inequality will become [38]. While beliefs about equality of opportunity have long been identified as an important determinant of attitudes towards inequality, efforts to relate such beliefs to factual characteristics of the income distribution have increased only recently [39]. The deepening gap between the rich and the poor is a key cause of the elimination of class movement and is common in most major countries around the world. In this study, we analyzed the impact of investment on the polarization of wealth in South Korea. We studied investments set up in real estate, stocks, and bitcoins, which have recently caused a huge boom in South Korea. Investing in real estate, stocks, and bitcoins has become very popular at a time when the polarization of wealth is accelerating compared to other countries, and many people are interested in such investments and are wanting to actively participate, regardless of whether they have considerable property or not. In this study, we sought to validate that investment is a factor in the polarization of wealth that further accelerates. Multiple regression analysis was used to examine the effect of investment on the polarization of wealth. First, we conducted an analysis by setting the income quintile share ratio as a dependent variable and setting real estate, stocks, and bitcoins as independent variables. Then we set real estate, stocks, and bitcoins as dependent variables, and set interest rates, household debts, incomes, and price indices as independent variables. Overall results of multiple regression analysis showed that real estate, stocks, and bitcoins set as the investment instruments in this study did not have a significant impact on the polarization of wealth.

8.2. Policy implications

In this study, real estate, stocks, and bitcoins set as the investment instruments did not have a significant impact on the polarization of wealth. This is because the popularity of real estate, stocks, and bitcoins in South Korea began in earnest in 2020. Despite the COVID-19 pandemic, the popularity of such investments has soared and these are expected to have substantially accelerated the polarization of wealth in South Korea from 2020. Based on results of multiple regression analysis, the research and economic policies on deepening the phenomenon of the polarization of wealth in South Korea and economic stabilization were discussed. In South Korea, fairness and balance of society are emerging as major issues, and the polarization of wealth is a very significant social and economic issue, and most people are discussing it with great interest. In this study, we focused on real estate, stocks, and bitcoins as investment instruments and attempted to analyze their impact on the polarization of wealth and to discuss solutions and policies for economic stability. Results of the multiple regression analysis showed that real estate, stocks, and bitcoins set as the investment did not have much impact on the polarization of wealth, but real estate, stocks, and bitcoins are expected to have a significant impact on the recent polarization of wealth in South Korea. Effective economic policy research for economic stabilization is likewise continuously needed. Research contributing to the economic revitalization by presenting economic, social, and institutional policy measures to resolve the deepening phenomenon of the polarization of wealth and the income inequality is also continuously required. We are confident that this study offers academic value and provides policy measures for economic stabilization.

Limitations and future recommendations

Research limitations did not reflect the economic stimulus for COVID-19 and global the liquidity expansion from 2020. For future research, it is necessary to evaluate further by securing data for 5 years (2020–2025) from 2020. From 2020, it is expected that conducting the research by analyzing data on real estate, stocks, and bitcoins for at least five years will better explain the polarization of wealth.

Data availability statement

Data included in article/supp. material/referenced in article.

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CRediT authorship contribution statement

Donghun Yoon: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

Appendix

○ Bayesian regression results

In this study, we conducted Bayesian regression analysis for accurate analysis. First, we conducted Bayesian regression analysis on the income quintile share ratio, real estate, stocks, and bitcoins. We set the income quintile share ratio as the dependent variable and real estate, stocks, and bitcoins as the independent variables.

Table 1
Bayesian regression analysis for the income quintile share ratio and investment

Variables Entered/Removed[a]						
Model		Variables Entered		Variables Removed		Method
1		Bitcoin, Stock, Real estate[b]		.		Enter
Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.951[a]	0.905	0.763	0.30679		
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.798	3	0.599	6.369	0.139[b]
	Residual	0.188	2	0.094		
	Total	1.987	5			
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.222	0.947		5.513	0.031
	Real estate	0.000006	0.000	1.002	2.517	0.128
	Stock	−0.001	0.001	−0.793	−2.314	0.147
	Bitcoin	0.000036	0.000	0.326	1.150	0.369

a. Dependent Variable: Income quintile.
b. All requested variables entered.
a. Predictors: (Constant), Bitcoin, Stock, Real estate.
a. Dependent Variable: Income quintile.
b. Predictors: (Constant), Bitcoin, Stock, Real estate.
a. Dependent Variable: Income quintile.

In this study, we conducted Bayesian regression analysis on the real estate, interest rate, household debt, income, and price index. We set real estate as the dependent variable and the interest rate, household debt, income, and price index as the independent variables.

Table 2
Bayesian regression analysis for the real estate, interest rate, household debt, income, and price index

Variables Entered/Removed[a]						
Model		Variables Entered		Variables Removed		Method
1		Price index, Interest rate, Income, Household debt[b]		.		Enter
Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.997[a]	0.994	0.971	16724.10191		
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47285113518.787	4	11821278379.697	42.265	0.115[b]
	Residual	279695584.713	1	279695584.713		
	Total	47564809103.500	5			
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.

(*continued on next page*)

Table 2 (*continued*)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
		B	Std. Error	Beta		
1	(Constant)	−346663.760	4918684.064		−0.070	0.955
	Interest rate	330150.565	238078.629	0.637	1.387	0.398
	Household debt	897.747	827.825	1.607	1.084	0.474
	Income	−57.027	19.832	−1.032	−2.876	0.213
	Price index	9334.905	59127.484	0.212	0.158	0.900

a. Dependent Variable: Real estate.
b. All requested variables entered.
a. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Real estate.
b. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Real estate.

We set the stock as the dependent variable and the interest rate, household debt, income, and price index as the independent variables.

Table 3
Bayesian regression analysis for the stocks, interest rate, household debt, income, and price index

Variables Entered/Removed[a]						
Model	Variables Entered			Variables Removed		Method
1	Price index, Interest rate, Income, Household debt[b]			.		Enter
Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.891[a]	0.794	−0.031	356.18030		
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	488109.071	4	122027.268	0.962	0.634[b]
	Residual	126864.403	1	126864.403		
	Total	614973.474	5			
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	70436.388	104755.302		0.672	0.623
	Interest rate	2004.325	5070.462	1.076	0.395	0.760
	Household debt	12.542	17.631	6.242	0.711	0.606
	Income	−0.069	0.422	−0.349	−0.164	0.896
	Price index	−838.012	1259.263	−5.295	−0.665	0.626

a. Dependent Variable: Stock.
b. All requested variables entered.
a. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Stock.
b. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Stock.

We set the bitcoin as the dependent variable and the interest rate, household debt, income, and price index as the independent variables.

Table 4
Bayesian regression analysis for the bitcoin, interest rate, household debt, income, and price index

Variables Entered/Removed[a]				
Model	Variables Entered		Variables Removed	Method
1	Price index, Interest rate, Income, Household debt[b]		.	Enter
Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

(*continued on next page*)

Table 4 (*continued*)

Model Summary						
1	0.900[a]	0.811	0.053	5615.99213		

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	134952675.198	4	33738168.800	1.070	0.612[b]
	Residual	31539367.635	1	31539367.635		
	Total	166492042.833	5			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1237195.002	1651705.494		0.749	0.591
	Interest	66218.226	79947.355	2.160	0.828	0.560
	Household	223.706	277.986	6.767	0.805	0.569
	Income	−0.677	6.660	−0.207	−0.102	0.935
	Price	−15707.424	19855.146	−6.031	−0.791	0.574

a. Dependent Variable: Bitcoin.
b. All requested variables entered.
a. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Bitcoin.
b. Predictors: (Constant), Price index, Interest rate, Income, Household debt.
a. Dependent Variable: Bitcoin.

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