

Cryptocurrency Investment In COVID-19 And Wealth Disparities
by

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Abstract

Blockchain technology has revolutionized the financial industry. The popularity of the new technology in United States has led consumers seeking to maximize the yield in their portfolio to diversify by purchasing related stocks. Due to the decentralization of stock market exchange in recent years, there has been an increase in the number of people engaged in day trading. The introduction of cryptocurrency and blockchain technology in 2008 has provided many investors especially minorities other options to engage in the market. The initial coin offerings, which is prevalent from an investor's standpoint, were developed as mechanisms to issue new shares in initial public offerings and have been particularly trendy in the COVID-19 environment. Using weekly trade price data from Bloomberg, Yahoo Finance, Blockchain.com and Federal Reserve Bank Data, this paper will examine investment strategies of different racial/ethnic groups in blockchain technology during and the COVID-19 pandemic in a panel date model. To what extent are investors using public coins such as Bitcoin and Ethereum as part of their investment portfolio mix during the pandemic? We find that the increase in the price of bitcoin and other cryptocurrencies during the pandemic may repress the investment strategy for marginalized groups in the economy.

JEL Classification: G0, G1, G4

Key Words: Financial Economics, Blockchain, COVID-19, Portfolio Diversification

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Introduction

The evolution of fintech and blockchain technology led to the emergence of bitcoin and other cryptocurrency coins. Created in 2008 by a Japanese hacker Satoshi Nakamoto, Bitcoin is one of the most famous virtual money derived from mathematical cryptography and received as an alternative to government backed currencies (Eng-Tuck & Fry, 2015). Bitcoin has gained a lot of momentum around the world since its inception and attracted many investors from different racial and ethnic groups. The blockchain technology can be described as peer-to-peer linked structure used to solve the problem of maintaining the order of transactions to avoid double-spending problem and has gain popularity among young generations. A blockchain can be considered a distributed database that is organized as a list of ordered blocks, where the committed blocks are immutable. The inherent characteristics of blockchain architecture and design provide properties like transparency, robustness, auditability, and security (Casino, Dasaklis, Patsakis, 2019). These coins are so popular that there is a struggle between people who want bitcoin to be a medium of exchange and those who want it to be a store of value. The intricacy and robustness of blockchain technology registration serves as an incentive for many young people to get involved in the initial coin offering.

For many young investors especially Blacks and Hispanics, the decentralized nature of cryptocurrencies may serve as an opportunity to accumulate wealth. These group of investors have traditionally stayed away from the stock market; however, digital coin seems more attractive because they see this platform as addressing inequality (Zhang, Basesscu and Ford, 2020). The USA today Harris Poll (August 17, 2021), indicates that 23 percent of African Americans and 17 percent of Hispanics as compared to 11 percent of white Americans are currently investing in digital assets. The digital coin may be an escape from financial institutions that have long discriminated against the marginalized groups in the economy. The digital asset may provide more inclusive environment for minorities because it is new, open, and seemingly has fewer barriers to entry. According to NORC survey studies from University of Chicago, cryptocurrencies are opening investment opportunities for more diverse investors at different levels. The random selection in the market for cryptocurrency, where investors do not compete for shares, can encourage equitable outcomes among stakeholders where the rich and poor people can amass stable investment shares (Rosu and Saleh, 2021). The struggle for digital coin such as Bitcoin, Ethereum, Ripple and others have bogged down the network congestion and high transaction fees

which was not anticipated initially when the cryptocurrency was created. Both Bitcoin, Ethereum, Ripple are listed as part of the 10 most popular cryptocurrencies in 2020 and 2021.

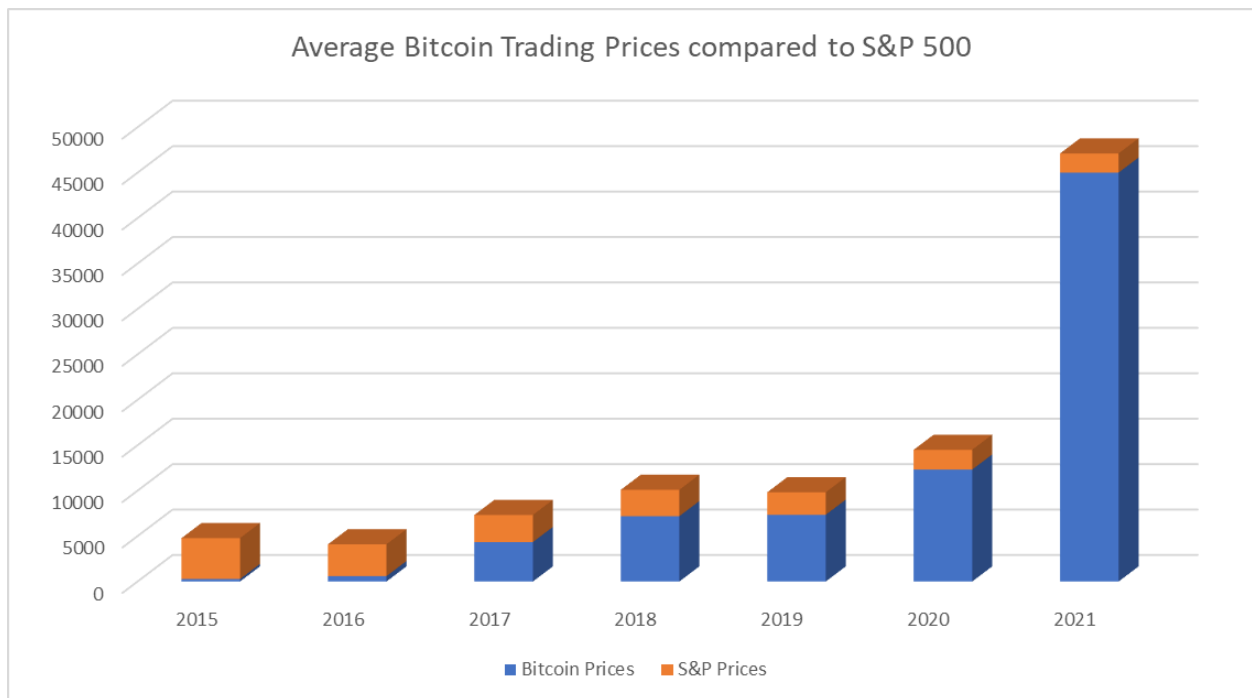
The surge in demand and supply of bitcoin and other cryptocurrencies can be attributed to the fact that they reduce excessive transaction costs associated with remittances with greater access to financial institutions. Over the years, these currencies have emerged in large numbers with an estimated value of \$218.78 billion for bitcoin in 2020 and \$866.32 billion in 2021. The total market capitalization for cryptocurrency market in August 2020 is estimated to be \$372.97 billion and total market capitalization of \$1549.61 billion in August 2021 (<https://www.coinranking.com>). This represents an increase of \$1176.7 billion in market capitalization. Below is a current list of the top 10 cryptocurrencies based on market capitalization.

Top 10 Cryptocurrency 2021		
	August 15, 2021	
Name	2021 Price	2021 Market Cap
Bitcoin	\$46,126.98	\$866.32 billion
Ethereum	\$3,157.04	\$368.18 billion
Tether USD	\$1.00	\$62.70 billion
Binance Coin	\$354.15	\$53.72 billion
Cardano ADA	\$1.48	\$46.18 billion
XRP	\$0.82	\$36.03 billion
Dodgecoin	\$0.26	\$33.88 billion
HEX	\$0.13	\$33.10 billion
USDCUSDC	\$1.00	\$26.74 billion
Polkadot	\$20.76	\$22.76 billion

Top 10 Cryptocurrency 2020		
	August 15, 2020	
Name	2020 Price	2020 Market Cap
Bitcoin	\$11,850.37	\$218.78 billion
Ethereum	\$433.40	\$48.37 billion
XRP-Ripple	\$0.30	\$13.30 billion
Tether USD	\$1.00	\$12.25 billion
Chainlink	\$19.67	\$7.54 billion
Bitcoin Cash	\$303.31	\$5.61 billion
Litecoin	\$60.15	\$3.92 billion
EOS	\$3.73	\$3.45 billion

Source: <https://www.coinranking.com>

With the COVID - 19 pandemic and the state of the global economy as well as high unemployment and short run shocks, investors see cryptocurrencies coins as the future of finance. The passion to acquire these digit assets by many investors across different ethnic groups has surged overtime. These digital currencies may be preferred to fiat money and even a store of value because they have lower transaction cost, minimum investment barriers, ensure liquidity, and investors around the world can diversify their portfolio given the large number of different coins in the market (<https://www.coinranking.com>). Bitcoin is regarded as the benchmark for the industry and comparing it to S&P 500 will be the effective and efficient mechanism of linking it to the market with treasury bill. As the chart below indicates, Bitcoin has outperformed the S&P 500 from 2015 to 2021. Although cryptocurrencies are unregulated, the revolution of bitcoin and cryptocurrencies exchanges around the world transformed the landscape of the financial institution.



Source: [BTC-USD 47,256.176 -1,653.9297 -3.3816% : Bitcoin USD - Yahoo Finance](https://finance.yahoo.com/quote/%5EGSPC/history?p=%5EGSPC)
<https://finance.yahoo.com/quote/%5EGSPC/history?p=%5EGSPC>

Bitcoin and other cryptocurrencies have help to protect small businesses and investors against currency devaluation and reduce the demand for hard currency such as the dollar or pound around the world. The increase in the price of bitcoin (by more than 300 percent between 2015 – 2021) and other coins in the market over the years may affect small investor because of the scarcity and

the cost of mining the coins. Acquiring shares of cryptocurrency can require computational mining strategies which only wealthy participants have access to (i.e., Blockchain “proof of work” coin collection strategy) or early access to tokens to acquire additional shares (i.e., the relaunch of Ethereum “proof of stake” coin collection strategy) which are problematic (Fanti, Kogan, Ruan, Viswanath, and Wang, 2019). The high price of digital asset maybe unattainable by many small investors and possibly squeeze out the marginalized communities from the blockchain space.

This paper explores cryptocurrency and digital asset investment among different investors and their portfolio mix during the pandemic. COVID-19 has led many investors to reassess their portfolio mix as the traditional investment strategies may not be optimal. Some studies show gold and soybean as safe haven commodities to protect their investments (Zi, Zhnag & Zhao 2020); however, the evolution of digital asset has become the new norm. Portfolio diversification may be necessary to optimize the return on investment; however, research on ethnic investors in this emerging digital assets space has been minimally addressed in the literature. The results will inform the extent to which the maginalized population in the economy may benefit with the appropriate policies. Section II of the paper examines the data and methodology of capital asset pricing model and investment in blockchain as it relates to different segments of society, section III analyzes the result and decomposition of minority investment in blockchain, and section IV concludes the paper.

II Data and Methodology

The stock data used for this study was collected from Yahoo Finance while asset and equity data come from Federal Reserve Bank of St. Louis economic database. Weekly closing price data is gathered for the top 10 cryptocurrencies beginning March of 2019 and ending in March 2021. Those closing prices are converted to weekly returns using the simple growth rate formula. The data also includes Bitcoin (BIT) as well as Standards and Poor’s 500 (S&P 500) as measures for market comparison. The weekly Betas are calculated with BIT as the benchmark in one instance and S&P as the benchmark in another. The calculation is performed by taking the sample covariance between each cryptocurrency return and the market benchmark return from the current and preceding week and dividing by the sample variance of the benchmark return from the current and preceding week. Quarterly average shares of assets and quarterly average shares of equity and

mutual funds are matched with the weekly data. These average shares are separated by race and ethnicity (i.e., the categories include Black, White, and Hispanic). Then, the following empirical model is employed:

$$E(R_i) = \beta_1 + \beta_2 R_f + \beta_3 \textit{Systematic Market Risk} + \beta_4 \textit{Unsystematic Risk} + e$$

The dependent variable, $E(R_i)$, is the weekly expected return from each cryptocurrency. R_f is the risk-free rate of return captured by weekly averages of the three-month treasury-bill. Note that movements in the risk-free rate of return can also be captured by a COVID-19 binary event variable, as is later employed in this analysis. *Systematic Market Risk* is amount of inherent risk resulting from volatility in the cryptocurrencies captured in the calculations of Beta mentioned above, while *Unsystematic Risk* captures the equity share variable or asset share variable. Specifically, unsystematic risk from wealth disparity arises because those with higher shares of wealth are likely to assume more risk. Note that estimating β_3 in this CAPM model, yields the risk premium or the slope of the security market line, which is the focus of this study. Also note, β_1 is a constant term and e is an error term; meanwhile β_2 and β_4 are the coefficients for the control variables.

III Results

Table 1 displays results for our benchmark regressions. Each table in this section is organized so that 1 and 4 are pooled regressions, 2 and 5 are random effects regressions, 3 and 6 are fixed effects regressions. The number of usable observations across data is 1082 and t statistics are shown in parenthesis below the estimated regressors. Equations 1-6 estimate the premium in the market with Bitcoin as the standard stock. The coefficient on the Bitcoin Beta indicates a 10 percent increase in weekly systematic risk or 10 percent increase in the risk premium significantly increases the expected return on cryptocurrency by about 4 percent at the 99 percent level of confidence. Also note, the strong inverse relationship between the three-month treasury bill and returns on cryptocurrency such that a 1 percent increase in the three-month treasury rate reduces the expected return on cryptocurrency by about 2 percent at the 99 percent level of confidence. White shares of asset holdings and White shares of equity holdings indicate garnering an additional share of assets or equity, at the 99 percent level of confidence, increases returns on cryptocurrency by about 23

percent and 26 percent, respectively. Meanwhile, at the 95 percent level of confidence garnering an additional asset share increases returns for Hispanics by about 40 percent but garnering an additional equity shares reduces cryptocurrency returns by about 46 percent at the 90 percent level of confidence. For Blacks, garnering an additional equity share increases returns on crypto currency by about 57 percent at the 99 percent level of confidence. Notice the regressions have poor explanatory power (i.e., an r-squared of 3 – 4 percent) except when considerations are made between investment prospects (i.e., r-squared between 35 – 40 percent).

The primary consequences of regressions in Table 1 are as follows. First, returns increase in a low interest rate environment since the opportunity cost of holding the risk-free instrument is higher than the opportunity cost of holding, say, cryptocurrency. Second, significant gains can be made on cryptocurrency, where Bitcoin is the benchmark if some consideration is given between instruments, as is indicated by the “between” r squared. This follows the finding of the original CAPM model that insists diversification matters. In this instance, the investor would do better to hold multiple cryptocurrencies. Finally, the unsystematic risk from wealth disparity indicate only Whites and Hispanics can increase their expected return on all cryptocurrency where consideration of their complete asset portfolio is involved; however, only Whites and Blacks can increase their expected return on cryptocurrency where equity holdings are involved. This indicates Whites and Hispanics have access to channels that will allow conversion of asset holdings to positive cryptocurrency returns, but Blacks must be direct holders of equity shares to gain significant cryptocurrency returns. Still, converting assets to cryptocurrency returns is a better strategy for Hispanics who will experience significant losses on cryptocurrency returns from direct purchase of equity shares. Insignificant gains from asset and losses from equity by Blacks and Hispanics respectively, indicate cryptocurrency market barriers that policy makers must tend to as not to exacerbate the issues of wealth disparity. Clearly this supports the notion that those with higher shares of wealth are likely to assume more opportunities to gain returns in the market for cryptocurrency.

Table 2 displays results similar to Table 1, except in this regression, the risk- free rate of return is replaced with the COVID – 19 binary indicator variables, which inherently explains movements in the risk-free rate of return as a policy response variable. At the 95 percent level of confidence, the COVID-19 environment has increased the returns on cryptocurrency by 3 percent. In this

environment Whites and Hispanics are converting their returns at a slightly lower rate than under normal, weekly average treasury rate movements. Specifically, additional asset shares increase White and Hispanic cryptocurrency returns by about 20 percent and 28 percent, respectively, which is lower than findings in Table 1. Although cryptocurrency returns for Blacks are higher, they remain insignificant. Cryptocurrency returns from investment in equity shares is about the same as Table 1 for Blacks and Whites, but the losses for Hispanics are more significant and larger in magnitude than in Table 1. They now meet the 95percent level of confidence with a coefficient of approximately negative 57. The marginal knowledge gain from Table 2 is that COVID-19 has exacerbated wealth and equity dipartites in the market for cryptocurrency.

Table 3 is comparable to Table 1 and Table 4 is comparable to Table 2; however, the regressors do a better job of explaining the returns to cryptocurrency. That is the “between” r squared is a about 50%, which is higher than the “between” r-squared in Table 1 and 2. This may be because in Tables 3 and 4, the Standard’s and Poor’s 500 is the benchmark asset market. The risk premium in this larger market is statically insignificant. Otherwise, the remaining inferences drawn from the regressions in Table 3 and 4 are the same as in Table 1 and 2, respectively. The marginal knowledge gain from Table 3 and 4 is the overall market for investments compared to the S&P 500 helps to better explain returns on cryptocurrency, but the premium on cryptocurrency in that larger market is insignificant. It may be worthwhile to mention, however, that the uncertainty regarding the use of cryptocurrency as an exchange or wallet (Hileman and Rauch’s, 2017) likely contributes to its inability to reach critical mass; thereby, hindering its relevance in the larger investment market.

IV Conclusion

This paper was intended to assess digital asset of small investors during the pandemic. Due to limited data availability and limited research on this subject, this study presents the unique opportunity to address policy issues relevant among various demographics. We find that COVID-19 has exacerbated wealth and equity dipartites in the market for cryptocurrency. New young investors are enthusiastic about the digital asset as they perceive it as potentially addressing inequality in the financial market; however, many of them are not currently participants in the stock market. According to Zhang, Basescu, & Ford, (2020), inequality can be addressed by means of a coin offering with equitable distribution, equitable supply, and rewards for early stakeholders.

Studies show that although Bitcoin was intended to be a decentralized digital currency, in practice, mining power is quite concentrated and as such policies must address inequalities in stakeholder acquisitions (Arnosti, & Weinberg 2019). Note that the increase in the price of cryptocurrency due to the high cost of mining may only encourage high income earners to be in the space. Coins such as Bitcoin, Ethereum and Ripple are expensive and scarce (Brown-Cohen, Narayanan, Psomas, & Weinberg, 2019; Fanti, Kogan, Oh, Ruan, Viswanath, & Wang, 2019) making it difficult for marginalized groups to acquire. The findings in this research are consistent with existing literature because those with higher shares of wealth are likely to increase their return on investment in the market for cryptocurrency.

Policy regulation should be constructed so that transparency among miners is encouraged and equitable access among investors will be tangible. As a new and unregulated market, the digital asset space seems to be restricted to high income earners in the economy. Policies can reform financial markets in ways that are consistent with social justice. For example, marginalized groups have been involved in fintech space through use of Zelle, CashApp, Facebook Cash, etc.; therefore, allowing coin purchases using these informal channels can help to encourage low-income earners to participate in this blockchain industry.

For an excessively bullish market with high returns, it will be difficult for some demographics to participate in this space or platform; however, there is an opportunity for a more diverse population of participants before the market expands, as suggested by this research. For instance, Somwanshi (2019) shows that holding the “powers that be” accountable as we develop and expand blockchain and cryptocurrency can lead to distribution and inclusion that is equitable and fair.

Table 1. Bitcoin Market Premiums with Risk Free Treasury Bill

	Expected Return on Cryptocurrency					
	1	2	3	4	5	6
3 - Month Treasury Bill Rate	-2.38*** (-2.77)	-2.38*** (-2.77)	-2.36*** (-2.75)	-1.91*** (-2.61)	-1.90*** (-2.61)	-1.89*** (-2.59)
Bitcoin Beta	0.39*** (3.51)	0.38*** (3.48)	0.37*** (3.31)	0.40*** (3.65)	0.40*** (3.62)	0.38*** (3.45)
White Asset Share	22.87*** (4.37)	22.83*** (4.37)	22.62*** (4.33)			
Hispanic Asset Share	39.72** (2.40)	39.60** (2.4)	39.03** (2.37)			
Black Asset Share	7.175 (0.42)	7.386 (0.44)	8.443 (0.50)			
White Equity Share				26.04*** (4.62)	25.99*** (4.62)	25.73*** (4.58)
Hispanic Equity Share				-46.57* (-1.82)	-46.40* (-1.82)	-45.62* (-1.79)
Black Equity Share				57.12*** (2.88)	57.03*** (2.88)	56.57*** (2.86)
Constant	-2033.5*** (-4.53)	-2030.7*** (-4.53)	-2016.6*** (-4.51)	-2363.0*** (-4.67)	-2358.1*** (-4.66)	-2335.1*** (-4.62)
N	1082	1082	1082	1082	1082	1082
R-sq	0.03	0.03	0.03	0.04	0.04	0.04
R-sq between		0.35	0.35		0.4	0.4

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 2. Bitcoin Market Premiums with Risk Free Rate in COVID-19 Event

	Expected Return on Cryptocurrency					
	1	2	3	4	5	6
COVID-19 Event	3.51** (2.42)	3.51** (2.42)	3.50** (2.41)	2.66** (2.14)	2.66** (2.14)	2.63** (2.42)
Bitcoin Beta	0.38*** (3.47)	0.38*** (3.44)	0.36*** (3.27)	0.40*** (3.64)	0.40*** (3.60)	0.38*** (3.44)
White Asset Share	20.03*** (3.98)	20.00*** (3.98)	19.81*** (3.95)			
Hispanic Asset Share	28.08* (1.90)	27.99* (1.89)	27.51* (1.86)			
Black Asset Share	10.81 (0.64)	11.01 (0.65)	12.06 (0.71)			
White Equity Share				26.79*** (4.76)	26.74*** (4.75)	26.48*** (4.71)
Hispanic Equity Share				-58.95** (-2.42)	-58.77** (-2.42)	-57.89** (-2.39)
Black Equity Share				57.46*** (2.89)	57.37*** (2.89)	56.91*** (2.87)
Constant	-1786.3*** (-4.18)	-1783.9*** (-4.18)	-1771.7*** (-4.16)	-2427.2*** (-4.79)	-2422.3*** (-4.79)	-2398.9*** (-4.75)
N	1082	1082	1082	1082	1082	1082
R-sq	0.03	0.03	0.03	0.04	0.04	0.04
R-sq between		0.35	0.35		0.4	0.4

T statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 3. Standards and Poor's Market Premiums with Risk Free Treasury Bill

	Expected Return on Cryptocurrency					
	1	2	3	4	5	6
3-Month Treasury Bill Rate	-2.37*** (-2.74)	-2.37*** (-2.74)	-2.35*** (-2.73)	-1.96*** (-2.67)	-1.96*** (-2.67)	-1.94*** (-2.64)
S&P Beta	0.0015 (0.23)	0.0014 (0.22)	0.0011 (0.17)	0.0005 (0.09)	0.0005 (0.08)	0.0002 (0.03)
White Asset Share	23.08*** (4.38)	23.03*** (4.38)	22.80*** (4.34)			
Hispanic Asset Share	40.31** (2.43)	40.17** (2.42)	39.54** (2.39)			
Black Asset Share	4.815 (0.28)	5.082 (0.30)	6.303 (0.37)			
White Equity Share				25.24*** (4.45)	25.19*** (4.45)	24.96*** (4.42)
Hispanic Equity Share				-41.59 (-1.62)	-41.46 (-1.62)	-40.88 (-1.60)
Black Equity Share				52.43*** (2.63)	52.38*** (2.63)	52.13*** (2.62)
Constant	-2041.4*** (-4.52)	-2038.1*** (-4.52)	-2023.0*** (-4.50)	-2288.1*** (-4.49)	-2283.5*** (-4.49)	-2263.0*** (-4.46)
N	1082	1082	1082	1082	1082	1082
R-sq	0.02	0.025	0.025	0.03	0.03	0.03
R-sq between		0.5	0.5		0.48	0.48

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 4. Standards and Poor's Market Premiums with Risk Free Rate in COVID-19 Event

	Expected Return on Cryptocurrency					
	1	2	3	4	5	6
COVID-19 Event	3.57** (2.44)	3.57** (2.44)	3.55** (2.44)	2.78** (2.23)	2.79** (2.23)	2.75** (2.21)
S&P Beta	0.0013 (0.20)	0.0013 (0.19)	0.0009 (0.14)	0.0004 (0.06)	0.0003 (0.05)	0 (0.00)
White Asset Share	20.28*** (4.01)	20.24*** (4.01)	20.03*** (3.97)			
Hispanic Asset Share	28.99* (1.95)	28.87* (1.94)	28.34* (1.91)			
Black Asset Share	8.515 (0.50)	8.777 (0.51)	9.984 (0.59)			
White Equity Share				25.95*** (4.58)	25.90*** (4.58)	25.67*** (4.54)
Hispanic Equity Share				-53.98** (-2.21)	-53.83** (-2.21)	-53.14** (-2.18)
Black Equity Share				52.85*** (2.65)	52.79*** (2.65)	52.54*** (2.64)
Constant	-1798.7*** (-4.18)	-1795.8*** (-4.18)	-1782.5*** (-4.16)	-2349.0*** (-4.61)	-2344.3*** (-4.61)	-2323.6*** (-4.58)
N	1082	1082	1082	1082	1082	1082
R-sq	0.02	0.02	0.02	0.03	0.03	0.03
R-sq between		0.5	0.5		0.48	0.47

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

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