Social Capital, Race, and Income Inequality in the United States

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Abstract: Since the 1980s, the United States has witnessed increasing wealth concentration in the hands of the ultra-rich. Measured at the state level, the top 10 percent of income earners amassed roughly 43% of total income, and economic growth only enhanced this inequality between the ultra-rich and the rest of citizens. This paper examines whether social capital plays a positive role in mitigating income inequality at the state level, with an emphasis on racial diversity and its relation to church attendance. The empirical findings demonstrate that social capital, whether measured by Robert Putnam's state-level social capital index (SCI), or a new measure that improves SCI's original measurement, fails to improve income equality. In comparison, racial diversity is found to be a consistent contributor of income inequality. In states with a greater proportion of minority population, the ultra-rich tend to share more wealth and social capital potentially facilitates the ultra-rich to enjoy the benefit of economic growth.

1. Introduction

Income inequality, manifested by the concentration of wealth in the hands of the ultra-rich, has long been an important issue in the United States. Using the state-level measures, Mark W. Frank [1] demonstrated that "For many states, the share of income held by the top decile experienced a prolonged period of stability after World War II, followed by a substantial increase in inequality during the 1980s and 1990s" [1] (p. 55). One proposal offered by social scientists to combat this inequality problem is to increase social capital that may help individuals to succeed economically. Social capital is the connection between and among social networks developed through face to face contact that foster norms of reciprocity and trustworthiness. Regarding the effect of social capital on economic development, Robert D. Putnam [2] in his landmark study claimed that "at the local or regional level, there is mounting evidence that social capital among economic actors can produce aggregate growth" [2] (p. 323). Social capital is seen as the connectedness for social stability and growth.

This study examines whether social capital serves to mitigate state-level income inequality. To test our main hypothesis derived from Putnam's [2] social capital thesis, which suggests that states with more social capital are more likely to produce income equality outcomes, this article reconsiders the original measurement of social capital, i.e., the social capital index (SCI). Our analyses indicate that, without considering racial diversity, Putnam's assertion about the negative relationship between inequality and SCI is incorrect at the state level. As suggested by Rodney E. Hero [3], Putnam's social capital thesis does not recognize the negative effect of racial diversity on equality at the state level. Moreover, social capital, as Hero aptly pointed out, has a salutary effect mainly for the white

communities at the expense of minorities. However, the validity of these hypotheses have never been examined in empirical studies [4].

To assess whether Putnam's SCI fully captures the concept and dimensions of social capital at the state level, we also emphasize another research tradition in the literature of ethnic studies. Minorities in the U.S. are largely depending on attending church services to build up successful networks and gain self-confidence in the society [5,6]. Though this type of civic activities may only enhance what Putnam called the bonding social capital for certain social groups, especially the racial minorities, church attendance unfortunately was not included in Putnam's [2] original computation of SCI. This negligence further produced a biased social capital measurement, which favors white population and against minorities. This study incorporates church attendance into the construction of a new SCI. The paper suggests targeting racial inequality in state policymaking to combat income inequality in the U.S. Only by more effectively addressing the potentially negative effects of social capital on minority population can Putnam's prediction of a more successful future, based on social capital building, be achieved.

2. Social Capital, Racial Diversity, and Income Inequality

The concept of social capital has multiple meanings [7–9]. Even if scholars can finally agree on the "right way" of conceptualizing this elusive term, the measurement remains a challenge. Perhaps the most influential measurement of social capital is the social capital index (SCI) developed by Robert Putnam [2] in his highly celebrated work, *Bowling Alone*. Relying on an array of indicators of social trust and community networks, Putnam incorporated both individual-level survey data and aggregate measures to build his SCI for 48 American continental states. Using this SCI, Putnam argued that social capital had a profound effect on how American states performed in terms of economic prosperity, health and happiness, democracy, criminal justice and public education, among others. An equally resilient system in public education and health is necessary to decrease income inequality and to sustain economic development [10,11].

While Putnam's seminal work on social capital has drawn attention from both scholarly communities as well as popular media outlets, his SCI has not produced a uniform level of support among scholars. One manifestation of this reluctance is the avoidance of the topic of social capital. For example, in the arguably most influential textbook of American politics at the state level, *Politics in the American States* [11], there is no single chapter devoted to social capital. In fact, the term of social capital was not even included in the index of the aforementioned text and no author used social capital to explain any significant public policy differences among states. In Chapter 19 of *Bowling Alone*, Putnam himself did not use his SCI measure to examine how social capital may affect economic success at the state level. Instead, his argument of positive effect of social capital on economic performances was mainly based on indirect evidence presented by scholars such as Mark Granovetter and Francis Fukuyama [2].

One reason why SCI has not been extensively adopted in the research of state policy is related to the way in which Putnam originally theorized the effect of social capital. Many studies about the social capital in the U.S. have indicated that Putnam's theory as well as his empirical tests had a built-in racial bias [3,12,13]. Rodney Hero [3] "juxtaposes" two different research paradigms and traditions, "social capital thesis" and the "racial diversity thesis". He concluded that Putnam inherited the first one: social capital thesis, which represents a long tradition in American political institutions in suppressing racial and ethnic minorities [14,15]. Scholars within the first tradition posit that Americans are empowered by joining the associational networks, which shape how political influence is structured. The major flaw of this tradition, according to Hero, is its lack of proper consideration of historic and systemic racial and ethnic inequality. Hero [3] asserted that race is so fundamental that it would simply "crowd out" the effect of social capital, and that the salutary effect of social capital is only true for whites. Hero suggested that social capital is limited in explaining minority school graduation ratios, minority school suspension ratios, black incarceration ratios, minority infant mortality ratios, as well as

states' minority registration and turnout ratios. Furthermore, Hero's models of political participation included more interactive terms to assess how the positive effect of social capital has been modified or diminished by racial diversity in states.

Besides racial diversity, the role of church involvement in measuring social capital and creating sustainable city, and their relations to income inequality have also been identified by the literature [6]. Putnam [2] identified two types of social capital: bonding and bridging capital. While bonding capital refers to the interpersonal solidarity that typically develops among small groups and local communities over extended periods of time, bridging capital focuses on relationships linking heterogeneous groups together [2,16]. In fostering a liberal participatory democracy, many scholars herald bridging capital as superior to bonding capital because it fosters cross-group reciprocity, has greater potential in solving collective action problems, and improves the quality of public discourse and deliberation essential for democratic citizenship [2,17]. In contrast, bonding capital has been described as the "dark side" of social capital and has the potential to be oppressive, exacerbating segregation, and producing illiberal effects [2]. Given that many Americans spend more time in churches than any other type of voluntary organizations [18], church involvement appears to have great potential to foster "bridging social capital" rather than "bonding social capital" [19].

However, upon a closer examination of the racial/ethnic composition of congregations, American churches are more likely to foster bonding rather than bridging capital. According to the National Congregations Survey, 9 out of 10 American church congregations are racially homogenous, with at least 90 percent of the congregation representing just one racial group [20]. In a separate study, the Multiracial Congregations Project shows that only eight percent of Christian religious communities are multiracial [21]. A more recent survey of racial diversity in American congregations indicates that 64% of whites attend mostly or all white congregations and 56% of blacks belong to mostly or all black congregations. Research in ethnic studies firmly establishes that religion remains of central importance for many Asian sub-populations in the U.S. [22] and the ethnic church is one of a few available institutions for gathering with co-ethnics [23]. Moreover, churches help first generation Asian immigrants overcome deficits in social status and help the children of immigrants maintain their ethnic identities [22,23]. Different from white, black, and Asian communities, only about half of Latinos attend churches that are mostly or all Latino. Latinos are attend most frequently Roman Catholic churches where membership tends to be more heterogeneous in terms of ethnic and racial composition.

For racial and ethnic minorities, there are additional barriers that inhibit the accrual of benefits perceived to flow from church membership. Emerson and Smith [22] contend that there is a greater "cost" of acquiring "meaning, belonging, and security" when one belongs to the minority group within a congregation. Moreover, minorities who remain on the "edge" of a heterogeneous congregation have fewer relational ties to the core of the group and are more likely to leave the congregation altogether [24,25]. The sociology literature also points to the "homophily principle", the theory that similarity cultivates connection and that relationships forged between similar individuals will be more binding [26,27]. While the homophily principle may explain why so many American churches are racially and ethnically segregated today, the perspective that members on the "edge" endure greater costs suggest that it is more difficult for congregational minorities to develop civic skills in racially and ethnically heterogeneous environments.

It is also important to note that church involvement can reduce the political participation gap between minority and white voters [28–30]. Research shows that church attendance increases the political participation of blacks [31–33], and voting participation of Asian Americans [34]. Churches also provide many opportunities for developing civic skills by giving speeches, organizing and facilitating meetings, mediating disagreements, and holding leadership and administrative responsibility positions for minorities [35]. These political and civic skills will further increase the social capital of minorities and decrease the income gaps between them and the white population.

In summary, there is a need to integrate more racial variables in the construction of SCI, and to explore more underlying relationships between social capital and income inequality for American

minorities. Moreover, church attendance has been proved as a positive factor of social capital for American minorities, which potentially may mitigate the income gaps. However, the racial segregations in American church congregations may also play a negative role in combating income inequality. It is, therefore, important to incorporate church attendance to the construction of SCI to explore the influence of social capital and racial diversity on income inequality at the state level in the United States [34].

3. Data and Methodology

As discussed in the previous section, Putnam's [2] social capital measure at the state level lacks explanatory power. One reason for the ineffectiveness of social capital in state-level analyses is the pluralistic approach in Putnam's theorization of social capital that downplays the power of traditional political institutions favoring the white majority [3]. Social capital, however, has also been found in the literature of ethnic studies generating a positive effect on minority political participation, which leads to minority political incorporation and empowerment [30,34]. This study combines the insights from these two seemingly contradictory findings, and reexamines the original measure of social capital index (SCI) constructed at the state level by Putnam [2]. Both multivariate analysis and visualization of SCI and other key state attributes indicate that SCI, as a measurement of social capital, systematically discriminates the bonding capital of minority groups. To better gauge the actual impact of social capital on income inequality at the state level, a more valid measurement of SCI that takes into consideration of church attendance is necessary.

3.1. Measuring Social Captial at the State Level

We first focus on how social capital was measured in previous studies at the state level. Putnam [2] classified the 14 variables that he originally used to derive his social capital index (SCI) into five groups: measures of community organizational life, measures of engagement in public affairs, measures of community volunteerism, measures of informal sociability, and measures of social trust [2] (p. 291). In Hawes's paper, 22 social capital terms are employed based on these five groups [36]. However, none of these variables measured the racial compositions of the states. Putnam in fact insisted the greater importance of social capital than racial composition. "A state's racial composition and rate of single-parent families also affect child well-being, though far less consistently or strongly than do poverty and low social capital" [2].

However, it is indeed surprising that Putnam's SCI was finally derived by his principal component analysis without any consideration of church attendance. More specifically, his measures of community organization life contained "served on committee of local organization in last year", "served as officer of some club or organization in last year", "civic and social organization per 1000 population", "mean number of club meetings attended in last year", and "mean number of group memberships" [2] (p. 291). None of these indicators were specifically concerned with church attendance. Though civic and social organizations might include churches, they were not a direct measure of the extent to which the population of a state attended church services.

The absence of church attendance in the construction of SCI raised a serious doubt about whether Putnam's state-level social capital captured fully a very important aspect of social capital building in the American states. This is especially problematic given the importance of the social capital of minority communities, largely thanks to their involvement in church activities. If Putnam's SCI [2] fully captures the bonding effect of social capital, it should contain at least a measure of church attendance. Conversely, if Putnam's SCI does not effectively capture church attendance at the state level, then it is possible that Hero's findings [3] on the lack of positive effect of social capital for minority groups might in fact be partially an artifact of the invalid measure of SCI in the first place. It is thus imperative to further assess the validity of SCI empirically.

To engage in an empirical test of the validity of SCI, it is important to understand the meaning of validity. The level of validity of a measurement for a concept is based on how effectively it captures the characteristics that it is intended to measure. In this sense, the concept of social capital should not be

measured by racial composition of a geographic area, as social capital itself is not intended to be a racial construct. In practical terms, however, it may be that a state with a high level of minority proportion has a much lower level of social capital than a state of mainly white homogenous communities. Putnam himself acknowledged that his SCI has a geographic pattern which reveals the fact that the more virulent the system of slavery is, the less civic the state is today [2]. This finding, according to Putnam, only helped strengthened his belief that his SCI is valid. Therefore, a southern state such as Louisiana should have a lower level of social capital than a "Scandinavian stock" state such as Wisconsin [2].

Hypothesis 1 (H1)**.** *The SCI is negatively correlated with racial composition measures such as black density at the state level.*

However, if the SCI is indeed intended to measure the concept of social capital at the state level, then one can reasonably expect that it should also show a close positive correlation between social capital and church attendance. This is because church attendance is a key way for civic engagement, enhancing interpersonal trust and accumulation of social capital in the American states [37]. Putnam and Campbell [38] more recently completed another systematic study of social capital mainly through the dimension of church attendance in their often-cited book, *American Grace: How Religion Divides and Unites Us*. They stated that "religion is not nearly as divisive as race" [38] (p. 516) and stressed that "the significance of the bridging social capital for building intergroup acceptance" [38] (p. 527). In particular, Putnam and Campbell argued that "religion serves as a sort of civic glue, uniting rather than dividing" [38] (p. 517). However, Putnam and Campbell also acknowledged that both Latinos and African Americans "tend to associate with the same ethno-racial groups" in their religious activities [38] (p. 525), therefore, more bonding capital tends to accumulate for these two racial groups based on church attendance. Regardless of the different types of social capital Americans tend to generate due to their racial identities, church attendance leads to greater social capital.

Hypothesis 2 (H2)**.** *The level of social capital, measured by SCI at the state level, should be positively associated with the level of church attendance.*

3.2. Data Source

Again, our hypotheses (H1 and H2) are that SCI should be negatively related to racial measures such as black population density, but positively related to church attendance. Most of our data were obtained from the 2000 US census. The measures of liberal and conservative population were based on New York Times surveys from 1977 to 1999. Other data were collected online and the coding and sources of the variables used in this study are provided in Table 1. After completing the measurement test of SCI, we present the findings derived from five multiple OLS regression models that test our main hypothesis concerning the role of social capital in mitigating income inequality at the state level. Based on Hero [3], we will also use racial diversity as our primary control variable to determine the relative effects of racial diversity and social capital on income inequality. It should be noted that states are the unit of analysis in this paper and spatial effect should be examined. However, Moran's I test suggests that spatial autocorrelation does not exist, and therefore multiple OLS regression models do not lead to biased estimations.

Table 1. Data Sources.

Variables	Source
Top 10% share: Top 10% income share	Frank, Mark. W., 2009 [1]
SCI and its 14 components	Putnam, Robert D., 2000 [2] (p. 487)

Table 1. *Cont.*

Variables	Source
Blk%: Percent black population	Census, 2000 [39]
Racial diversity: The level of racial diversity at the state level	Census, 2000 [39], based on the formula from Hero, Rodney, 1998 [4]
Church attend: Percent attend religious service at least once a week	2007, Pew Forum [40]
Liberal%: Percent mass public liberal	1977–1999. [41]
Conservative%: Percent mass public conservative	1977–1999. [41]
Secularism: Percent secular belief	2007, Pew Forum [40]
Density: Population per square mile	Census, 2000 [39]
Urban: Percent population in urban areas	Census, 2000 [39]

4. Findings

Table 2 shows bivariate correlation coefficients between SCI and other state-level attributes. As expected, SCI is indeed highly correlated with black percentage of the population at the state level ($r = -0.698$). The other racial composition variable, racial diversity used in Hero's study [3] is also negatively correlated with SCI ($r = -0.624$). These findings are consistent with our first hypothesis (H1).

Table 2. Bivariate Correlation Coefficients.

	SCI	Blk%	Racial_di	Attend	Lib%	Con%	Secul	Dens	Urb
SCI	1								
Blk%	−0.698	1							
Racial_div	−0.624	0.462	1						
Attend	−0.415	0.541	0.095	1					
Liberal%	0.115	−0.213	0.122	−0.697	1				
Conserv%	−0.194	0.338	−0.055	0.743	−0.90	1			
Secularism	0.485	−0.579	−0.133	−0.956	0.71	−0.77	1		
Density	−0.162	0.177	0.216	−0.227	0.41	−0.53	0.299	1	
Urban	−0.187	0.003	0.607	−0.213	0.32	−0.45	0.286	0.53	1

Figure 1 further displays the three-dimensional relationships between SCI and black population density, and between SCI and racial diversity. The heights of vertical bars are the magnitudes of SCI, and the bottom panel shows the relationship between black population density and racial diversity. As expected, the level of black population density (the horizontal dimension) is positive related to the level of racial diversity ($r = 0.462$, see Table 2). The distribution of the vertical bars (i.e., the magnitudes of SCI) shows that the high level of SCI states are normally those with low levels of black population density and racial diversity, and the short bars of SCI are normally those located on the right side of the bottom panel.

There is also one state, located on the right side of bottom panel and denoted as letter A, that is apparently an anomaly, as it has a high level of black population density and a high level of racial diversity, and yet the social capital measure (SCI) for this state, Maryland, is also much higher than other similar racially diverse states. On the left side of Figure 1 there is also an anomaly, denoted as letter B, the State if Kentucky, that has a much shorter SCI bar, compared to other nearby highly

homogenous states. Overall, Figure 1 visually displays that Putnam's high social capital states (SCI) are basically those racially homogenous and white dominant states.
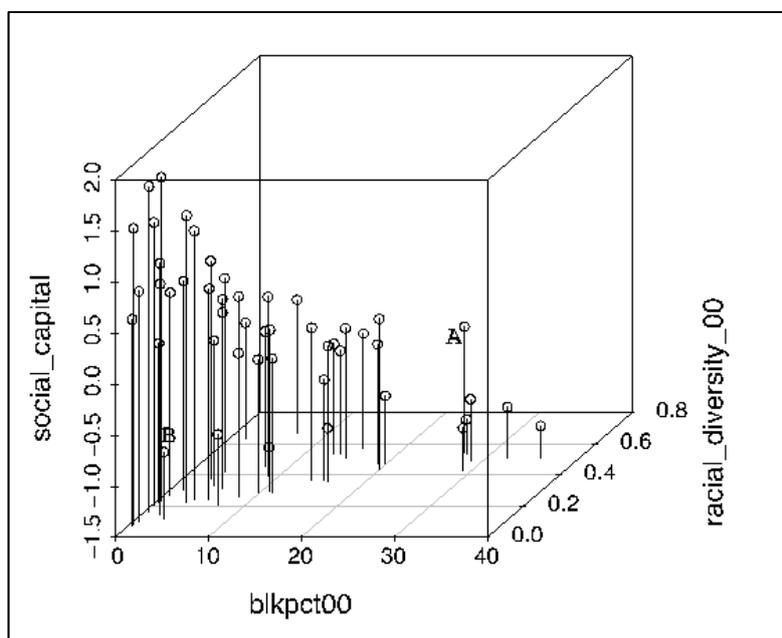

Figure 1. A three-dimensional scatterplot for social capital index (SCI).

Table 3 also shows that church attendance is negatively correlated with SCI ($r = -0.415$), which is contrary to our second expectation. In other words, an increase in a state's church attendance rate is negatively correlated with SCI. This finding provides some support for our assertion that the exclusion of church attendance in Putnam's SCI configuration raised an important question about the validity of SCI. Religion, as Putnam and Campbell [38] suggested, is not as divisive as race, and church attendance should facilitate bridging capital for most Americans, and even for African Americans and Latinos going to church means building more bonding capital. Thus, this negative correlation coefficient offers support to the notion that SCI does not effectively capture the role of religion.

Table 3. Principal Component Analysis of State-Level Attributes.

	Component 1 Loading	Component 2 Loading
SCI		0.458
Blk%		−0.386
Racial_div		−0.523
Attend	0.449	
Liberal%	−0.411	
Conservative%	0.450	
Secularism	−0.467	
Density		−0.363
Urban		−0.423
Proportion of Variance	0.456	0.288
Cumulative Proportion	0.456	0.744

Furthermore, the relationships between church attendance and other value-related state attributes including the percent of population who self-identify as political liberals are also revealed in Table 3. Based on the correlation coefficients, the states with more liberals and those believing in secularism are much less likely to have a higher level of church attendance than the states with more conservatives. These findings, however, are based on bivariate relationships. It is important to examine whether a

multivariate analysis leads to the same conclusion. Table 3, thus, adopts a principal analysis of all nine state-attributes, and provides the factor loadings of all attributes along the first two components.

Table 3 shows that the first two principal components explain almost three quarters of all variance, and the patterns of factor loadings strongly suggest that the first latent factor is related to how states are clustered based on religious issues, and the second latent factor is about how states' internal communities are structurally constructed. We can summarize these two latent factors as the value factor (the first component) and the structure factor (the second factor). It is the second factor that SCI has the largest positive loading (0.458), which suggests that Putnam's measure of social capital at the state level is most likely a manifestation of an underlying structure which generates a more positive effect for the white homogenous communities. In comparison, the racial diversity of a state, population density, and urbanization all are negatively connected with this underlying community structure (factor loadings are −0.523, −0.363, and −0.423, respectively).

Figure 2 graphically displays the above findings. The two principal components are shown along two perpendicular dimensions. The value factor is displayed along the horizontal dimension to which secularism, liberal percent, conservative percent, and church attendance are closely related. Social capital index, represented by the upward arrow in Figure 2, is closely associated with the second latent factor to which black percent, racial diversity, population density, and urbanization are negatively connected.
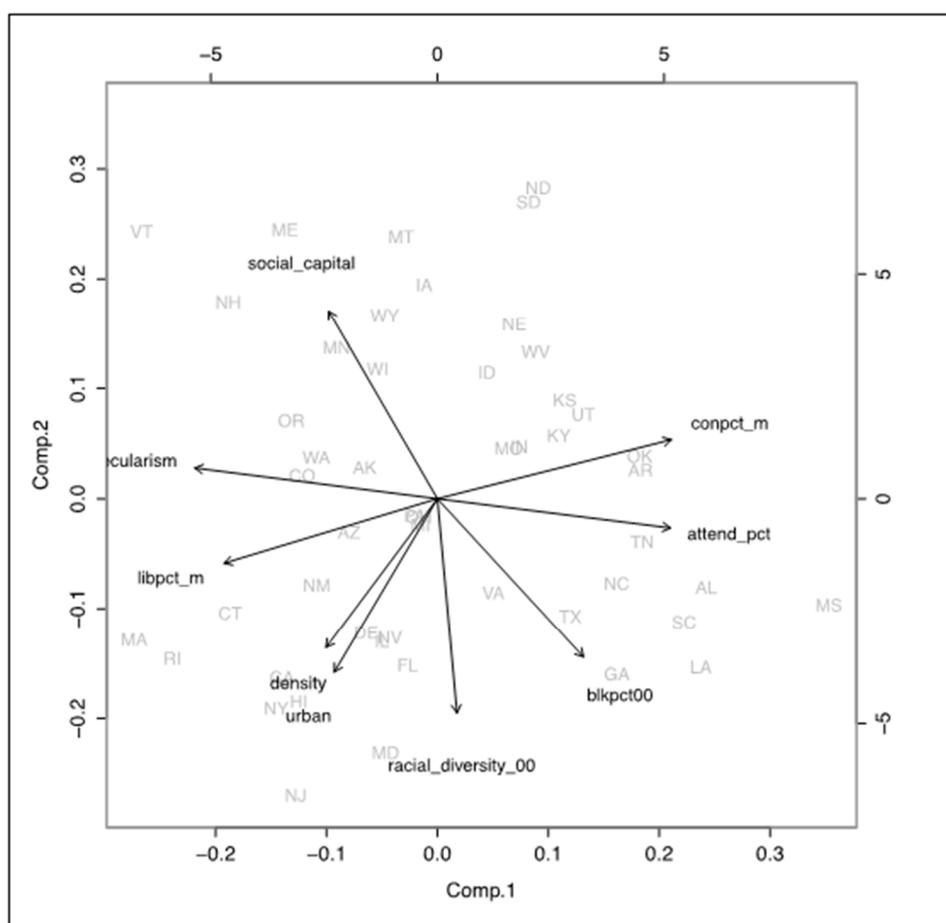

Figure 2. Biplot for state-level attributes.

One particular advantage of biplot is the identifications of placements of all units of analysis (in this case the American states) derived from the multivariate principal component analysis. We can see from Figure 2, for example, North Dakota and South Dakota, two very similar states based on

their attachments to the two principal components, are located at the top of Figure 2, which suggests that they are best represented by high SCI and low values on racial diversity measures. Figure 2 also shows that the SCI arrow points to the directions of those northern states such as Montana, Maine, Vermont, New Hampshire, Minnesota, and Wyoming. The opposite of these states are those located in the southern states with a high level of black proportion, such as Georgia, Texas, and Louisiana, among others.

Notice from Figure 2 that the arrow (vector) of SCI and that are of black percent formed almost a straight line, which suggests that they are close to a perfect negative correlation. In short, to find the strength of the association between two variables in Figure 2, one only needs to find the corresponding angle (a perpendicular angle suggests no correlation between the two variables at all). Most southern states are within the angle of black percent (the vector called blkpct00 in the figure) and church attendance (attend_pct), indicating that these Southern states such as Louisiana and Minnesota, are best described as high black proportion and high church attendance rate among the state populations. However, these are also the states with a low level of social capital. This finding, once again, confirms our first hypothesis (H1) and rejects our second (H2). SCI, in short, is a measure with a built-in bias against states with significant minority population shares.

5. Social Capital, Racial Diversity, and Income Inequality at the State Level

Our bivariate and multivariate analyses also show that one of the major limitations in Putnam's SCI as the measure of social capital at the state level is its exclusion of church attendance in deriving the factor scores. To correct this mistake, one simple solution is to rerun the same principal component, but include the church attendance variable in the multivariate model. The new factor score (hereafter new_SCI) based on this revised principal component analysis is provided in Table 4. A total of 15 variables (Putnam's original 14 variables plus the church attendance measure) were used to derive this new_SCI.

Table 4. New SCI and Putnam's SCI Compared.

State	SCI	SCI_Ranking	New_SCI	New_SCI_Ranking
North Dakota	1.71	1	5.20	1
Minnesota	1.32	4	5.20	2
South Dakota	1.69	2	5.16	3
Montana	1.29	5	4.83	4
Iowa	0.98	7	3.90	5
Vermont	1.42	3	3.62	6
Nebraska	1.15	6	3.38	7
New Hampshire	0.77	8	3.36	8
Washington	0.65	10	2.77	9
Maine	0.53	13	2.73	10
Wisconsin	0.59	11	2.61	11
Oregon	0.57	12	2.39	12
Colorado	0.41	15	1.89	13
Kansas	0.38	16	1.45	14
Connecticut	0.27	17	1.31	15
Utah	0.50	14	1.26	16
Wyoming	0.67	9	1.21	17
Massachusetts	0.22	18	1.10	18
Missouri	0.10	19	0.51	19
Arizona	0.06	21	0.47	20
Delaware	−0.01	23	0.44	21
Alaska	*NA*	*NA*	0.25	22
Michigan	0.00	22	0.17	23
Rhode Island	−0.06	24	0.16	24
Idaho	0.07	20	0.15	25
Indiana	−0.08	25	−0.25	26
Ohio	−0.18	27	−0.38	27

Table 4. *Cont.*

State	SCI	SCI_Ranking	New_SCI	New_SCI_Ranking
Pennsylvania	−0.19	29	−0.50	28
California	−0.18	28	−0.66	29
Illinois	−0.22	30	−0.74	30
Oklahoma	−0.16	26	−0.74	31
Maryland	−0.26	31	−0.95	32
New York	−0.36	34	−1.25	33
Hawaii	NA	NA	−1.27	34
Virginia	−0.32	32	−1.28	35
New Jersey	−0.40	35	−1.43	36
Florida	−0.47	36	−1.65	37
New Mexico	−0.35	33	−1.70	38
Arkansas	−0.50	37	−2.06	39
Texas	−0.55	38	−2.23	40
Kentucky	−0.79	39	−3.11	41
West Virginia	−0.83	41	−3.15	42
North Carolina	−0.82	40	−3.27	43
South Carolina	−0.88	42	−3.65	44
Nevada	−1.43	48	−3.69	45
Tennessee	−0.96	43	−3.88	46
Louisiana	−0.99	44	−3.88	47
Alabama	−1.07	45	−4.26	48
Georgia	−1.15	46	−4.55	49
Mississippi	−1.17	47	−4.97	50

To test our main hypotheses about the positive effect of social capital on income equality, we perform multiple regressions on the measure of income inequality at the state-level developed by Mark W. Frank [1]. If Putnam's social capital thesis correct, we expect that states with higher social capital mitigate income inequality among their citizens. The dependent variable is the proportion of total state income shared by the top 10 percent of income earners. We used the data for the year of 2000, which has the mean of 42.86 (i.e., the top 10 percent earned, on average, 42.85% of total incomes at the state level), the maximum of 52.7 (Connecticut), the minimum of 36.64 (West Virginia), and standard deviation of 3.93.

Table 5 shows five OLS equations for state-level income inequality. The first equation entered two independent variables: racial diversity and Putnam's original SCI. As shown by the first equation, racial diversity is positive and statistically significant at the $p < 0.05$ level, which suggests that the increase of racial diversity will lead to an increase in income inequality at the state level [3,4]. This finding is consistent with Hero's claim that to uncover the nature of inequality at the state level, one has to pay attention to states' racial diversity, and states with more racial minority presence often experience more inequality. In contrast, the first equation of Table 5 also shows that Putnam's original social capital measure (SCI) failed to achieve statistical significance, which is contrary to our expectation that social capital should mitigate income inequality.

As discussed above, Putnam's SCI should be improved by incorporating the measure of church attendance at the state level. The second equation of Table 5, therefore, used the new SCI in the OLS model, and the result once again shows that racial diversity leads to income inequality. Putnam's original SCI again failed the significance test, and our new SCI turned out to be statistically insignificant. This finding provides evidence that Putnam's claim of the salutary effect of social capital at the aggregate level [2] is not supported by our state-level analysis.

Table 5. Multiple OLS Regressions of Income Inequality in American States.

	Model 1	Model 2	Model 3	Model 4	Model 5
	b (s.e)	b (s.e)	b (s.e)	b (s.e)	b (s.e)
Racial Diversity	9.5 (3.99) **	10.70 (3.97) ***	9.68 (3.92) **	9.61 (3.34) **	6.67 (3.2) **
SCI	0.65 (0.86)				
New_SCI		0.31 (0.24)			
Transformed SCI			0.019 (0.021)		
Transformed New_SCI				0.008 (0.004) *	0.0021 (0.005)
Density					0.004 (0.002)
Conservative %					0.15 (0.12)
Intercept	39.34	38.92	39.3	39.9	45.19
R Squared	0.11	0.13	0.12	0.16	0.29
Aju. R Squared	0.08	0.09	0.08	0.13	0.23
N	50	50	50	50	50

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

After examining the relationship between income inequality and SCI as well as new SCI, a non-linear relationship emerges. When social capital is low, it positively contributes to income inequality, but when the social capital index measure is over 0, the increase of income inequality slows down. Income inequality decreases soon after social capital index crosses over 0 and drops quickly as it reaches high levels. The best-fit curve can be explained by the following polynomial function:

$$Y = -X^2 + 40X \tag{1}$$

We used the transformed SCI and the transformed new SCI to run three more regressions. Model 3 (Table 5) shows that racial diversity remains statistically significant, but transformed SCI is not significant. However, the new SCI is significant in Equation 4 after the transformation, which suggests that the transformed new SCI is more closely related to income inequality, although it is significant at a 0.1 level (two-tailed test). Regression analysis has therefore confirmed that the non-linear relationship between our new SCI and income inequality is marginally significant: income inequality tends to rise with the increase of social capital but declines with the further rise of social capital. Check the variance in income inequality and social capital at state level, the evidence is also plausible. For example, an increasing trend in both income inequality and social capital could be observed in Mississippi, while a declining trend could be found in Idaho [38].

Model 5 further compares the relative effects of racial diversity and social capital by entering two more controls. This model explains 29% of the variance in income inequality. The first control is the population density measure, which is used to gauge whether or not states with population concentration may cause income inequality. This variable, however, did not reach the statistical significance level for a two-tailed test (though its *p*-value is 0.103, which is very close to the threshold of 0.1). The second control is the proportion of population who are conservative in the year of 1999. We entered this variable into the equation to examine whether a larger conservative populace may lead to a greater level of income inequality because of the ideology of relying on market power in state public policymaking process. This variable did not turn out to be statistically significant either.

Model 5 in fact shows that only racial diversity is a statistically significantly positive factor when controlling for the transformed new SCI, population density, and conservative influence. In short, the overall findings of Table 5 strongly suggest that racial diversity is a consistent factor affecting how states' income inequality is played out. A larger proportion of minority population in American states, according to our empirical analysis, is associated with greater levels of income inequality. Social capital either failed to play a role, or, when it does play a role, it enhanced the income disparity as states start to increase their social capital level initially, as demonstrated by our non-linear model (Model 4).

6. Conclusions and Discussion

Piketty and Saez [42] found that income inequality in the United States has become an enduring problem since the 1980s when government policies such as the Tax Reform Act of 1986 were enacted. While all states rewarded the top 10 percent with a large share of total state income, states do vary in income inequality rates. Hero [4] in his award-winning book, *Faces of Inequality*, called for that "more scholarly attention needs to focus on the 'big picture' of state politics, and states need to be seen as central to the 'big picture' of the U.S. politics" [4]. We attempted to find the determinants of state income inequality, especially whether the influential social capital thesis can be applied to the study of state income inequality.

We started with the hypothesis that social capital can mitigate income inequality at the state level. We derived this hypothesis from the notion that "At the individual level, social connections affect one's life chances" which was argued forcefully by Robert Putnam in *Bowling Alone*. Putnam [2] also asserted that social capital "can produce aggregate economic growth" [2] (p. 323). He explicitly used minority economic success, the so-called the Chinese "rag trade" in New York, to support his belief that social capital works positively for traditionally marginalized groups [2] (p. 320).

Our empirical test of the social capital's impact on income inequality at the aggregate level, nevertheless, shows the opposite result. Social capital turned out to be either a facilitator of income inequality, or it failed to exert any effect when controlling for other potential predictors of income inequality. In our findings, there is no evidence that income inequality would be reduced by social capital, especially when states start to accumulate more social capital initially. What can be the underlying reason for this negative finding?

Our first clue is the competing explanation of inequality based on the racial factor in American states. Hero [3] pointed out repeatedly that social capital has failed to generate its presupposed salutary effect on the chance for minorities to succeed in America. In this regard, we found systematic evidence that racial diversity is a robust predictor of income inequality. When controlling for the effects of social capital, population density, and ideological distribution, the ultra-rich in the states with large shares of minority populations, in fact, occupy even greater economically advantageous positions.

Our second answer is from the fact that Putnam original social capital index can be further improved. Based on his theory of social capital and his other follow-up study of religion in the U.S. [40], one would expect that his SCI would be positively related to church attendance, because regardless of bonding or bridging capital it might generate, church attendance is a major factor of connecting Americans to others. On the contrary, there is a negative correlation between SCI and church attendance at the state level. This measurement error could be the reason why social capital failed to accomplish its positive role on income equality. However, after we incorporated church attendance into Putnam's original 14 variables to construct a new SCI, the empirical findings still suggested that no salutary effect of social capital is in existence to mitigate income inequality. Therefore, we conclude with reasonable confidence that social capital is not only a factor favoring white homogenous communities, but also a potential benefit for the ultra-rich to enjoy the benefit of economic growth. Social networks indeed help Americans economically, but they offer more to those who already have the resources to begin with.

It is also important to note that Putnam [2] indeed cautioned that "social capital of the right sort boosts economic efficiency" [2] (p. 325). Though he did not specify that income inequality could be a result of some "bad" social capital, it is possible that income inequality is a side effect of social capital. If social capital indeed has a positive effect on economic growth, but because growth is correlated with income inequality [1], social capital then likely produces an indirect negative effect on income inequality. Of course, to find whether this indirect effect exists, more research is needed to include factors such as spatiality [43] and mobility [44]. This paper, however, represents an important step to both measure social capital more accurately and empirically compare the explanatory power of social capital and racial diversity at the state level. The overall message from this study is to target racial inequality at the state-policy level to combat income inequality in the U.S.

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