The Impact of Social Capital on Household Welfare in Indonesia Using the Propensity Score Matching Method

Vinda Yulinda[1], Mohtar Rasyid[2]

Abstract:

This study aims to analyze the impact of social capital on household welfare in Indonesia. Social capital is considered an important asset that contributes to improving the economic and social welfare of households, but access to and utilization of social capital is not always evenly distributed among different groups in society. This study uses the Propensity Score Matching (PSM) method with the Average Treatment Effect on the Treated (ATT) approach and stratification techniques to estimate the influence of various social capital indicators on household welfare. The estimation results show that social capital has a positive and significant effect on household welfare, particularly through participation in social gatherings, membership in cooperatives, religious activities, neighbourhood security, social gatherings, women's activities, and childcare. However, some forms of social capital that are communal in nature and related to basic services do not show a significant difference in household welfare. These findings confirm that strengthening social capital plays an important role in improving household welfare in Indonesia

Keywords: *Household Welfare, Social Capital, Propensity Score Matching, Indonesia*

1. Introduction

National development essentially aims to improve the overall quality of life of the people. For decades, the success of development has often been measured by aggregate economic growth indicators. However, this approach is increasingly seen as inadequate because it does not fully reflect the welfare of communities at the micro level, particularly households. High economic growth is not always accompanied by an equitable improvement in household welfare, especially when income distribution is uneven and access to economic and social resources remains limited (Kinanti et al., 2024).

In Indonesia, welfare inequality between regions, particularly between urban and rural areas, as well as between socioeconomic groups, remains a structural problem. Data from the Central Statistics Agency shows that although poverty rates have declined,

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[1] *Universitas Trunodjoyo Madura, Indonesia.*
[2] *Universitas Trunodjoyo Madura, Indonesia,* mohtar.rasyid@trunojoyo.ac.id

income disparities and inequalities in access to education, decent work, and productive assets remain relatively high. This situation indicates that improvements in household welfare are not determined solely by economic factors, but are also greatly influenced by social factors inherent in community life (Nasution et al., 2014).

One social factor that has gained increasing attention in development literature is social capital. Social capital is understood as social assets embedded in social networks, norms, and levels of trust between individuals that enable coordination and cooperation to achieve common goals. Social capital includes the dimensions of trust, social networks, and participation in social and community activities (Bhandari, 2024). The existence of strong social capital is believed to be able to increase households' access to information, economic opportunities, social assistance, and strengthen household resilience in facing economic and social shocks (Faisal et al., 2025).

Community welfare is not only determined by economic factors, but also by the strength of social relationships, norms, and participation in the community. Research Nasution et al. (2022) shows that social capital, particularly social networks and trust, plays an important role in improving the welfare of disadvantaged communities, while the role of government does not always have a direct impact. These findings confirm that strengthening social capital is a crucial aspect of supporting sustainable welfare development.

In this study, social capital is represented through community participation, namely household Participation in various social, institutional, and community activities in their neighborhood. Meanwhile, household welfare is represented through household characteristics, such as the head of household's level of education, type of employment, household size, income, and asset ownership. Conceptually, social capital is thought to influence household welfare by expanding access to economic and social resources, strengthening community solidarity, and increasing efficiency in utilizing available opportunities (Nasution et al., 2014).

However, the causal relationship between social capital and household welfare is not easy to identify directly. The main challenge in estimating this relationship is selection bias, whereby households with high levels of social capital tend to have different initial characteristics compared to households with low social capital, such as higher levels of education, broader access to information, and relatively better economic conditions (Alemu & Tola, 2020; Rani et al., 2021). What is the impact of social capital in terms of trust, social networks, and social participation on household welfare in Indonesia?

To address these issues, this study uses the Propensity Score Matching (PSM) method. This method allows researchers to compare households with different levels of social capital but similar observable characteristics. This study aims to provide stronger empirical evidence regarding the role of social capital in improving household welfare in Indonesia.

2. Theoretical Background

A literature review on the relationship between social capital and household welfare shows consistent findings that social networks, levels of trust, and participation in community activities contribute significantly to improving household welfare, both in economic and non-economic dimensions (Bhandari, 2024). Social capital is not only viewed as a social attribute, but also as a resource that can generate economic, social, and psychological benefits for individuals and households.

Theoretically, Coleman (1988), reinforces the understanding of the role of social capital by emphasizing that social structures and relationships between individuals can be viewed as a form of capital that facilitates collective action and helps individuals achieve economic and social goals more efficiently. Coleman's conceptual framework places social capital as a resource inherent in social relations that can be converted into welfare benefits.

Similiar results were shown by Narayan & Pritchett (1999) in their study in Tanzania, which found that social capital has a significant effect on increasing household income. Households with strong social networks have greater opportunities to engage in productive economic activities due to easier access to information, informal loans, and social support during times of crisis. This study is an important reference in development literature because it shows how social capital can function as productive capital in developing countries.

The study by Mukharohmah et al. (2024) provides strong empirical evidence at the national level that social capital plays an important role in reducing poverty in Indonesia. Using data from 34 provinces, the study shows that the dimensions of social capital in the form of trust and social participation have a significant effect on reducing the percentage of poor people, while the dimension of tolerance has a relatively small effect. These findings indicate that households living in environments with high levels of trust and social participation tend to have better welfare conditions than households in weak social environments.

Social capital plays an important role in improving household welfare in Indonesia, particularly through cross-ethnic trust, participation in mutual aid activities, and trust in the government. Regions with higher levels of social trust tend to have lower poverty rates and higher household consumption, including among poor households. This shows that social capital functions as an informal mechanism that helps households access economic resources, reduce vulnerability, and improve overall welfare (Suryahadi et al., 2024).

Overall, the literature shows a relatively consistent pattern that social capital plays an important role in improving household welfare through various mechanisms, both economic and social. Higher social participation, strong levels of trust, and extensive community networks enable households to improve access to resources, strengthen

economic resilience, and improve quality of life. However, most previous studies still rely on conventional econometric approaches, such as OLS regression, which are prone to selection bias due to differences in initial characteristics between households. This condition emphasizes the importance of using more robust methodological approaches, such as Propensity Score Matching, to obtain more reliable estimates of the impact of social capital on household welfare.

3. Methodology

This study uses a quantitative approach with a non-experimental design to analyze the impact of social capital on household welfare in Indonesia. The data used is sourced from the fifth wave of the Indonesia Family Life Survey (IFLS 5), which is a national household survey that provides comprehensive information on the social, economic, and demographic conditions of households in Indonesia (Strauss et al., 2016). The unit of analysis in this study is the household, with the sample selected based on the completeness of data on the variables used in the analysis.

In this study, the potential for selection bias arises because household participation in social activities as a proxy for social capital is not determined randomly, but rather through a mechanism of self-selection. Households with higher levels of education, greater income, better asset ownership, and more stable types of employment tend to have a higher probability of being involved in social and community institutional activities (Fiorillo et al., 2020). At the same time, these initial characteristics also directly affect household welfare levels. Thus, it is possible that the observed welfare differences between households with high and low social capital are partly influenced by unbalanced initial conditions between groups.

These initial characteristics include the socioeconomic conditions of households prior to the measurement of social capital, such as the level of education of the head of household, initial income and expenditure, asset ownership, household size, and type of employment. These variables act as confounding variables because they affect both the probability of receiving treatment (high social capital) and the outcome (household welfare) (Yasa & Wijaya, 2025). If these differences are not controlled for, estimates of the effect of social capital on welfare are likely to be distorted, and the resulting coefficients will no longer represent pure causal effects.

Conceptually, the relationship between social capital and household welfare is formulated in the equation

$$KR_i = \alpha + \beta PM_i + \varepsilon_i$$

Where KR_i indicates the welfare level of household i, PM_i represents the level of community participation as a proxy for social capital, α is a constant, β is the coefficient of the effect of social capital on household welfare, and ε_i is the error term. However, given that the data used is observational, the estimation of this relationship has the potential for selection bias, where households with higher levels of social

capital tend to have different initial characteristics compared to households with low social capital (Alemu & Tola, 2020; Rani et al., 2021)

To address this issue, this study uses the Propensity Score Matching (PSM) method, which allows for causal impact estimation by matching treatment and control units based on observable characteristics Rosenbaum & Rubin (1983). Within the PSM framework, households with high social capital are treated as the treatment group ($D_i = 1$), while households with low social capital are treated as the control group ($D_i = 0$). Propensity score is defined as the probability of a household having high social capital based on observable characteristics, as follows:

$$p(X_i) = P(D_i = 1) \mid X_i$$

Where X_i includes household characteristics such as education, employment, household size, income, and asset ownership (Caliendo & Kopeinig, 2008).

The impact of social capital on household welfare was then estimated using the Average Treatment Effect on the Treated (ATT), which is formulated as:

$$ATT = E(KR_i^1 - KR_i^0 | D_i = 1)$$

Where KR_i^1 and KR_i^0 each representing the level of household welfare with and without high social capital (Imbens & Wooldridge, 2009). With this approach, the study is expected to produce more reliable empirical estimates of the role of social capital in improving household welfare in Indonesia, as well as to make an important contribution to the formulation of development policies based on strengthening social capital and community institutions.

4. Empirical Findings/Result

In this study, the potentially endogenous treatment variable is social capital through community participation in various social and institutional activities. Endogeneity arises because social participation does not occur randomly but is influenced by initial household characteristics such as education, income, and asset ownership, which also affect welfare levels. In addition, there is the possibility of a two-way relationship (reverse causality), whereby more prosperous households are more likely to participate in social activities (Jumirah & Wahyuni, 2018). This condition causes the treatment variable to potentially correlate with the error term and cause bias in causal estimation if not adequately controlled.

Social capital in this study is operationalized through household participation in various social and community institutional activities that reflect the dimensions of trust, social networks, and social participation. Each indicator is measured using a dummy variable that indicates household participation in specific activities.

Table 1. Description of Social Capital Variables based on Dimensions

Dimension	Variable	Operational Definition	measurement
Trust	religion	Household Participation in religious activities within the community	1 = yes 0 = no
	healthsavings	Participation in community-based health savings mechanisms	1 = yes 0 = no
	sanitation	Participation in community collective sanitation management	1 = yes 0 = no
	waste	Participation in community-based waste management	1 = yes 0 = no
Networks	cooperative	Household participation in cooperatives	1 = yes 0 = no
	ruralcredit	Participation in village savings and loans	1 = yes 0 = no
	youthcommunity	Participation in youth groups	1 = yes 0 = no
	womenactivity	Participation in women's activities	1 = yes 0 = no
	toddlercare	Participation in toddler health posts	1 = yes 0 = no
	eldercarepost	Participation in elderly health posts	1 = yes 0 = no
	library	Participation in village libraries	1 = yes 0 = no
Social Participation	meeting	Participation in community meetings	1 = yes 0 = no
	cooperate	Participation in community service/mutual assistance	1 = yes 0 = no
	village_upgrade	Participation in village improvement programs	1 = yes 0 = no
	rotation	Participation in neighbourhood watch/security patrols	1 = yes 0 = no
	pnpm	Participation in community empowerment programs	1 = yes 0 = no
	political	Participation in local political activities	1 = yes 0 = no

In this study, 15.921 respondent data units were used. The characteristics of the respondents can be briefly observed in Table 2 as follows:

Table 2. Summary Statistics of Variables Household Welfare

Variable	Mean	Std. Dev.
hhsize	3.671809	1.794434
exp	1303944	1194626
logexp	13.42681	2.165722
electricity	0.9916365	0.091072
drinking	1.640286	1.178986
toilet	9.261969	1.648791
rubbish	6.952848	1.353396
refrigerator	1.016529	0.8896893
tv	0.874679	0.3310935
cooking	4.362924	1.110615
healthyfund	0.5786632	0.6879536
sktm	1.194995	0.4026404
card_blt	1.169246	0.3812517
bsm	1.115311	0.3255346
jslu	1.0027	0.0815135
familycard	1.908594	0.2881951

Source: Indonesia Family Life Survey (IFLS 2014), processed data

Based on Tabel 2, Household welfare is represented by a number of socio-economic indicators and asset ownership. These variables reflect the basic conditions and economic resilience of households, including household size (*hhsize*), expenditure (*exp* and *logexp*), as well as access to basic facilities and services such as electricity (*electricity*), drinking water source (*drinking*), sanitation (*toilet*), and waste managemenst system (*rubbish*). In addition, household asset ownership indicators are also used, such as refrigerator ownership (*refrigerator*), television (*tv*), as well as the type of cooking fuel (*cooking*).

Social and administrative protection aspects are also included to capture a broader dimension of welfare, including participation in health funds (*healthyfund*), psossession of a certificate of poverty (*sktm*), ownership of social assistance cards such as BLT, PKPS, BBM, and BLSM (*card_blt*), assistance for poor students (*bsm*), social security for the elderly (*jslu*), as well as family card ownership (*familycard*). These variables are used to classify households into higher and lower welfare groups.

Table 3. Summary Statistics of Variables Social Capital

Variable	Mean	Std. Dev.
meeting	0.5542052	0.4971011
cooperative	0.1634703	0.3698787
village_upgrade	0.6107325	0.4876361
cooperate	0.7399956	0.4386846
rotation	0.64331	0.4791021
sanitation	0.4615385	0.498703
waste	0.4621928	0.4988044
womenactivity	0.2002442	0.4004276
toddlercare	0.2101285	0.4075537
eldercarepost	0.1139028	0.3177598
youthcommunity	0.2024741	0.4018944
religion	0.6604406	0.4735881
library	0.1218962	0.3273506
ruralcredit	0.1200345	0.3250721
healthsavings	0.497561	0.5001974
pnpm	0.213155	0.4095922
political	0.2837157	0.4508636

Source: Indonesia Family Life Survey (IFLS 2014), processed data

Meanwhile, Table 3 presents social capital indicators measured through community participation in various social and institutional activities at the community level. Social capital is represented in the form of a binary variable that indicates whether households participate (1) or do not participate (0) in certain activities. These indicators include Participation in community meetings (*meeting*), Household participation in cooperatives (*cooperative*), Participation in community service/mutual assistance (*cooperate*), Participation in village improvement programs (*village_upgrade*), Participation in neighborhood watch/security patrols (*rotation*), Participation in community collective sanitation management (*sanitation*) and Participation in community-based waste management (*waste*), Participation in women's activities (*womenactivity*), Participation in toddler health posts (*toddlercare*), Participation in ederly health posts (*eldercarepost*), Participation in youth groups (*youthcommunity*), Household Participation in religious activities within the community (*religion*), Participation in village libraries (*library*), Participation in village savings and loans (*ruralcredit*), Participation in community-based health savings mechanisms (*healthsavings*), Participation in community empowerment programs (*pnpm*), and Participation in local political activities (*political*).

In the context of observational data, estimates of the direct impact of social capital on household welfare are potentially subject to selection bias, as socially active households tend to have different initial characteristics compared to less active households. The correlations between these variables are as follows:

Table 4. ATT Estimation with the Stratification Analytical Standard Errors

Social Capital Indicators	n.treat	n.contr	ATT	Std.Err	Score t
meeting	2872	12310	0.274	0.042	6.486
cooperative	356	14460	0.187	0.071	2.634
cooperate	3381	11796	0.291	0.068	4.276
village_upgrade	2868	12316	0.204	0	0
religion	5515	9663	0.332	0.045	7.311
library	108	14699	0.031	0.216	0.143
ruralcredit	278	14035	0.236	0.057	4.169
youthcommunity	802	14344	0.129	0.061	2.119
healthsavings	612	14470	0.048	0.11	0.438
pnpm	780	14145	0.161	0.049	3.287
political	1013	14027	0.112	0.046	2.428
rotation	1928	13240	0.297	0.066	4.500
sanitation	624	14459	0.217	0.096	2.271
waste	486	14186	0.058	0.124	0.470
womenactivity	163	13485	0.279	0.107	2.604
toddlercare	278	14501	0.315	0.085	3.703
eldercarepost	271	14605	0.099	0.086	1.144

Based on the results of Table 4 Average Treatment Effect on the Treated (ATT) estimates, this study found that social capital has a positive and significant effect on household welfare in Indonesia. Households with higher levels of social participation have better welfare levels than comparable households with lower social capital. A t-statistic value exceeding the significance threshold ($t > 2$) indicates that the difference in participation is statistically significant and reflects a systematic influence on household welfare (Gujarati & Porter, 2009). Participation in community, religious, and neighborhood watch meetings showed the greatest and statistically significant impact, indicating that involvement in local social and institutional networks expands access to information, economic support, and a sense of security that contributes to improved well-being.

In addition, informal network-based activities such as social gatherings, women's activities, and childcare have also been shown to strengthen household welfare through mechanisms of social solidarity and mutual support. However, some forms of social capital that are public services, such as village libraries, health savings, waste management, and elderly health posts, do not show a significant impact, indicating that their existence is more influenced by public policy and institutional capacity than household social participation. These findings confirm that strengthening community-based social capital is an important instrument in strategies to improve household welfare in Indonesia.

The results of this study are reinforced by the findings of Purbowo & Rahmadhani (2025) which show that social capital simultaneously has a significant effect on household welfare, particularly through the strengthening of social networks that expand households' access to information, resources, and institutional support. Although conducted in the context of farming households and using a linear regression approach, the results of this study are in line with the findings of this study based on Propensity Score Matching (PSM), namely that participation in various social and institutional activities has a positive impact on household welfare. The similarity of these results confirms that social capital, particularly in the form of networks and social participation, is an important and consistent factor in improving household welfare in Indonesia across sectors and regions.

Theory Coleman (1988) states that social capital acts as an effective resource in improving household welfare, especially when supported by adequate social and economic capacity. Households with higher levels of social participation tend to have stronger networks, trust, and mutual assistance mechanisms, enabling them to expand access to economic opportunities and social protection that have a positive impact on welfare. However, the insignificance of several social capital indicators suggests that improvements in household welfare do not depend entirely on the strength of certain social capital. In the Indonesian context, collective values such as mutual assistance and social norms of obligation continue to encourage community participation across welfare groups, so that the role of social capital in welfare is contextual and not solely determined by household economic conditions. Thus, social capital is an important factor in improving household welfare, but its effectiveness is highly dependent on institutional support and the social character of the local community.

5. Conclusions

This study aims to analyze the effect of social capital on household welfare in Indonesia using data from the fifth wave of the Indonesia Family Life Survey (IFLS) and the Propensity Score Matching (PSM) method. The results show that social capital has a positive and significant effect on household welfare. Households with higher levels of social participation were found to have better welfare levels than households with similar characteristics but lower levels of social capital. These findings indicate that social capital is an important factor in improving household welfare, in addition to economic and demographic factors.

Furthermore, the estimation results show that the impact of social capital on household welfare varies across indicators. Participation in community meetings, membership in cooperatives, religious activities, neighborhood watch activities, social gatherings, women's activities, and childcare have a positive and significant effect on household welfare. This shows that household involvement in social networks and local institutions can expand access to information, social support, and economic opportunities that contribute to improved welfare. However, some forms of social capital related to public services and certain communal activities, such as village libraries, health savings, waste management, and elderly health posts, do not show a significant effect on household welfare. This condition indicates that the effectiveness of social capital is greatly influenced by the quality of participation and accompanying institutional support.

Overall, the results of this study confirm that strengthening community-based social capital plays a strategic role in efforts to improve household welfare in Indonesia. Therefore, development policies need to focus not only on improving economic aspects, but also on strengthening social dimensions through increased community participation, local institutional development, and the creation of a conducive and inclusive social environment. With the right policy support, social capital can be optimized as an instrument of sustainable development and contribute to reducing welfare disparities between households and regions.

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