



The Effect of Internet Usage on Social Capital in Indonesia

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ABSTRACT

The development capital consists of financial capital, physical capital, human capital, and social capital. Social capital focuses on efforts to empower social relations. The relationship between social capital and ICT, especially the internet, has become an interesting debate. In fact, several studies have been conducted with quite diverse findings. The internet is able to connect people who are far from each other, but on the other hand, it often makes people who are physically close to each other seem far apart. This study aims to examine the effect of internet use on social capital in Indonesia. The data is obtained from the fifth Indonesian Family Life Survey (IFLS-5). The study found that in general, internet users have lower social capital than non-internet users. Likewise, highly educated people have higher social capital than people with low education. Then, internet users with higher education have higher social capital when compared to internet users with lower education. This means that the use of the internet must be accompanied by the readiness of human resources (digital literacy) in accepting new technology, filtering the flow of incoming information, and educating the public about how to use the internet in healthy, safe, and wise manner.

1. Introduction

Development capital can be categorized into several forms including financial capital, physical capital, human capital, and social capital. These forms of capital differ in the investment process to obtain social and economic benefits (Usman, 2008). Economic capital is associated with efforts to manage, allocate, increase and use the funds owned as a resource to obtain economic or social benefits through productive activities. Physical capital is linked to factors of production of goods or services and the infrastructure to process them. Human capital is related to skills, intelligence, educational level and individual experience. Social capital focuses on efforts to empower social relations (Usman, 2018). Mutual trust, tolerance, mutual respect are very important social assets to enhance cooperation and community cohesiveness for development goals.

In the digital era as it is today, information and communication technology, especially the internet has changed the way we communicate, work, socialize, acquire information, create information, and share information with the world with dispatch. The internet has a significant influence on social life, including social capital. On the one hand, the internet brings people who are far in distance closer, but on the other hand, it is often considered setting apart people who are physically near. In the Indonesian context, research related to the influence of the internet on social capital was conducted by Priatama et al (2020). They did research related to social interactions among Indonesian youth, especially in remote areas in Probolinggo regency, East Java province. The results showed that the internet has strengthened social capital. The study also found that the internet had reduced the sense of ownership of their village, especially demonstrated by the lack of villagers' willingness to remain a native villager. However, Priatama et al (2020) did not describe the overall condition of Indonesian society in terms of the influence of the internet on social capital, but only highlights explicitly the social interaction of youth in rural areas. Therefore this study attempts to see the extent to which the internet affects social capital in Indonesian society as a whole, not only in rural areas but also urban areas, both the young and the elderly population, and based on the levels of education, regional characteristics, interaction between internet use and education, and the interaction between internet use and regional characteristics (urban/rural). The objectives of this study are to examine the effect of the internet on

social capital, how its effect is difference between in urban and rural communities, and to examine the influence of education level on the effect of the internet on social capital.

This study uses the fifth Indonesia Family Life Survey (IFLS-5) data conducted in mid-2014 and early 2015 and data on the number of Base Transceiver Stations (BTS) in 2014 obtained from the Ministry of Communication and Informatics (MCI). The IFLS-5 data is selected because it contains information on indicators that represent social capital and information related to internet use, while the previous IFLS data did not. This data remains relevant to current conditions as there has been no significant changes on the availability of the internet infrastructure between 2014 and 2019. According the data obtained from MCI, the number of base transceiver station (BTS) in Indonesia was 74,133 in 2014 and slightly increases to 76,749 BTS in 2019. In addition, the emerging issue at the beginning of the internet development that "Internet brings us closer but often drive us further apart" is still relevant to be discussed.

2. Literature Review

2.1. Social Capital

Social capital is defined as a set of specific informal values that are instant, or norms shared by all group members that allow cooperation between members of the group (Fukuyama, 2002). Social capital focuses on efforts to utilize social relations (Usman, 2018). Tolerance, mutual trust, mutual respect are very important social capital to increase community cooperation and cohesiveness for national development. By adopting a social capital reference of Grootaert & Narayan (2004), this study utilizes several variables that will likely affect social capital. In this study, social capital is approached with a social capital index that is constructed from several group of indicators as follows:

a. Dimension of collective and participatory action

One important indicator of social capital output is the existence of collective action from group members which is reflected in various forms of activities carried out in the public or group interest (Grootaert & van Bastelaer, 2002). This dimension includes mutual cooperation, community service, fundraising for disaster victims, and so on.

b. Dimension of social cohesion and inclusion

Social cohesion can be defined as the unity, the wholeness, and the cohesiveness to encourage group members remain in the community. According to Pranadji (2006), the strength of social capital is an essential factor for the community to survive. Social capital increases with the creation of community cohesiveness. Closeness in social relations between community members is expected to be able to reduce various social problems that occur in the neighbourhood. Those who feel safe in their activities have a higher social capital index (BPS, 2016).

c. Dimension of trust and solidarity

Trust is the main element in shaping social capital. Without a sense of trust among individuals, it is challenging to realize social interaction that further hinder good social relations. A social capital model proposed by Yamin & Damanto (2016) and Lin (1999) put trust as one of the collective assets that influence individual access to resources in the network. In addition, an international conference on measuring social capital held by the OECD in 2003 agreed that trust is a key dimension of social capital (BPS, 2016).

d. Dimension of groups and networks

To benefit from social capital, everyone must maintain and expand social networking. Both can be done by becoming part of social groups and actively participating in various activities. The more social networks formed, the more a person's opportunity to access and utilize the social capital that exists in the network (BPS, 2016).

2.2. The Role of the Internet in the Social Field

Usman (2018) has summarized several studies related to the importance of the internet on social capital, into at least three views. The first view states that the internet facilitates the increase of social capital based on an assumption that the internet is an instrument that is able to shorten distances and bring space closer. In this case, the internet plays an important role in expanding the network. As stated by Hampton & Wellman (2003), the internet is a new way of interacting as well as adding new networks, replacing the traditional way. The wider the network, the more likely social capital increases (Quan-Haase & Wellman, 2001).

The second view considers that the use of the internet makes it easy to develop social relations that are very liberal. It is free from the control of social norms, free from sanctions, and easy to tarnish social values that have become a common consensus. This view believes that online interaction results in reduced interaction with the family, with the friendship groups, and with the neighborhood (Quan-Haase & Wellman, 2001; Shklovski et al., 2006).

The third view assumes that the internet is only a supplement for social capital development. These circles agree that the internet is important, but not dominant, means of communication both in family relations and in friendship relations. Like other means of communication (such as telephone cable), e-mail or chat facilitated by the internet is only a supplement of social interaction to facilitate social relations. For instance, a study of Howard et al (2001) shows that e-mail is an important medium in maintaining relationships with relatives or friends, yet communication via telephone has not declined.

2.3. Previous Research

In the Indonesian context, there have been many studies that discuss the role of social capital on the economy. Putnam et al (1993), in their book, considers "*arisan* (Indonesian Rotating Savings and Credit Association)" activities as one form of social capital, where *arisan* put forward the principles of mutual cooperation, kinship, trust, and norms that are applied in a society. Research on the role of social capital on household welfare in Indonesia has also been carried out by Grootaert (1999) in three provinces, namely Jambi, Central Java, and East Nusa Tenggara. The results showed that the role of social capital in improving welfare is almost the same as the role of human capital. Households with high social capital have higher per capita expenditure, more physical assets and savings, and better access to credit. Grootaert's (1999) research has been followed by several studies related to the role of social capital in improving social welfare and poverty reduction in Indonesia (Balady, 2018; Nasution, 2016; Vipriyanti, 2007; Yamin & Dartanto, 2016). Another study by Suryanggono & Ismalina (2013) has utilized SUSENAS 2009 data to prove the influence of social capital on the economic growth of provinces in Indonesia. Meanwhile, Halimatussadiah (2013) examined the role of social capital in collective community action, especially in environmental issues. The results showed that social capital significantly affected individual contributions to collective action.

A research specifically focused on the influence of the internet on social capital was conducted by Siraj (2018). The study attempted to see how the internet affects the social capital of urban youth in Pakistan. The results found that the use of the internet has significantly reduced the use of telephone cable and face-to-face communication, expanded the gap between individuals, reduced family gatherings, and alleviated the participation in social activities. But on the other hand, the internet also plays a role in helping users to connect with distant relatives, old friends, and make new friends. In the Indonesian context, research related to the influence of the internet on social capital was conducted by Priatama et al (2020). They conducted research related to social interactions among Indonesian youth, particularly in remote areas in 330 villages in Probolinggo regency of East Java province. The results showed that the internet has strengthened social capital of the users. However, the internet was monitored to reduce the sense of ownership of their village, especially demonstrated by the lack of villagers' willingness to remain a native villager. The better access to information and networks obtained by a village youth the higher chances for them to move out the village when they see better opportunities elsewhere. However, the study cannot be generalized to national level regarding the influence of the internet on social capital as they only highlighted the social interaction of the youth in rural areas.

3. Method

3.1. Data and Variables

The main independent variable in this study is the use of the internet by the community. This study also includes several control variables that are hypothesized to affect social capital. Meanwhile, the dependent variable in this study is the social capital index which is composed of four dimensions, namely: 1) Dimension of collective and participatory actions; 2) Dimension of social cohesion and inclusion; 3) Dimension of trust and solidarity; 4) Dimension of groups and networks. These four dimensions are composed of indicators selected from the IFLS questionnaire. Each dimension has a certain contribution on the social capital. The contribution of each indicator is determined based on the distribution of data using a statistical method to extract the factor, namely Factor Analysis with Principal Component Analysis (PCA). Each index is measured by using a weighted average index of all related indicators, then the index of each dimension is determined using the following formula:

$$Z = \frac{\text{Observable Score} - \text{Minimum Score}}{\text{Maximum Score} - \text{Minimum Score}} \times 100 \dots\dots\dots (1)$$

After measuring the index of each dimension of social capital, the social capital index is calculated for each individual. The index of individual social capital is calculated using the weighted average of all indexes of the social capital dimensions that is calculated by using equation (1). Meanwhile, the weight (w_j) for each dimension is also calculated by using the Principal Component Analysis. The social capital index for the i^{th} individual is calculated using the following equation:

$$SCI_i = \sum_{j=1}^4 w_j Z_{ij} \dots\dots\dots (2)$$

Where:

- SCI_i = Social Capital Index of the i^{th} individu
- w_j = Weight of the j^{th} social capital dimension
- Z_{ij} = the j^{th} social capital dimension index for the i^{th} individu

3.2. Specification of Research Variables

The specifications of the research variables can be seen in the Table 1.

Table 1. Variable specification

Variable	Variable Specification	
<i>Dependent variable</i>		
Social Capital Index (SCI)	Measured based on 16 variables (indicators) with each indicator having a weight calculated by Principal Component Analysis.	
<i>Main variable</i>		
Internet User (INT)	Dummy internet usage by individuals; 1 for individuals using the internet, and 0 for others	
<i>Control Variable</i>		
Individual	Age (AGE)	Age of the individual
Characteristics	Sex (SEX)	Dummy Sex; 1 for male, and 0 for the other
	Job Status (JOB)	Dummy job status, 1 if working, 0 if not working / others.
	Education (EDU)	1 if studying less than 7 years (not attending school, kindergarten, elementary school or equivalent), 2 if studying 7 to 12 years (SLTP, SLTA or equivalent), 3 if studying for more than 12 years (D1, D2, D3, S1, S2, S3 or equivalent)

	Variable	Variable Specification
	Marital status (MAR)	Dummy marital status, 1 if married, and 0 if not married/ others.
	Level of Welfare (WEALTH)	The compiled welfare level index is measured from several indicators related to the respondents' assessment of the welfare conditions of each.
	Level of happiness (HAPPY)	The compiled index of happiness level is measured from several indicators related to respondents' assessment of their happiness and satisfaction.
	Handphone Ownership (HP)	Handphone ownership dummy, 1 if the individual has a handphone, and 0 for the other
Regional Characteristics	Urban/Rural (URAL)	Urban/rural dummy; 1 if located in an urban setting, and 0 for others
	Signal Strength (SIGN)	The number of BTS per 1 million population in one province (BTS Density)

3.3. Empirical Model

This study proposes the following models to estimate the effect of the internet on the social capital:

- a. Model I. It only includes the use of the internet as the main independent variable:

$$SCI_i = \beta_0 + \beta_1 INT_i + e \dots\dots\dots (3)$$

- b. Model II. It includes the variable in model I and other variables: education, gender, age, marital status, job, happiness level and welfare level as control variables:

$$SCI_i = \beta_0 + \beta_1 INT_i + \beta_2 EDU_i + \beta_3 SEX_i + \beta_4 AGE_i + \beta_5 MAR_i + \beta_6 JOB_i + \beta_7 HAPPY_i + \beta_8 WEALTH_i + e \dots\dots\dots (4)$$

- c. Model III. It includes all the variables in model II and additional variables: region, signal strength, and hand phone ownership as control variables:

$$SCI_i = \beta_0 + \beta_1 INT_i + \beta_2 EDU_i + \beta_3 SEX_i + \beta_4 AGE_i + \beta_5 MAR_i + \beta_6 JOB_i + \beta_7 HAPPY_i + \beta_8 WEALTH_i + \beta_9 URAL_i + \beta_{10} SIGN_i + \beta_{11} HP_i + e \dots\dots\dots (5)$$

Based on previous research on the effect of the internet on social capital that has been carried out by Siraj (2018) and Priatama et al. (2020), this study intends to find out more about the extent to which the internet influences social capital in Indonesian society based on the level of education (low, middle and high education) and region (urban/rural). Thus, three research hypotheses are proposed as follows:

- a. Effect of internet use on social capital:
 - H₀ : The use of the internet has no significant effect on social capital
 - H₁ : The use of the internet has a significant effect on social capital
- b. Effect of the use of the internet on social capital based on the level of education
 - H₀ : The use of the internet has no significant effect on social capital for every level of education
 - H₂ : The use of the internet has a significant effect on social capital for every level of education
- c. Effect of internet use on social capital based on region (Urban / Rural)
 - H₀ : The use of the internet has no significant effect on social capital in both urban and rural areas
 - H₃ : The use of the internet has a significant effect on social capital in both urban and rural areas.

4. Results and Discussions

4.1. Descriptive Statistics

Table 2 displays descriptive statistics of the variables used in the estimation process. Socio-demographic characteristics consist of age, gender, profession, education, marital status, mobile phone ownership, internet use, wealth, and happiness level. Meanwhile, regional characteristics consist of urban/rural areas and Signal Strength/BTS Density which indicates the number of BTS per 1 million population per province. Respondents are mostly at productive age group and female. The respondents are also dominated by those who work in the informal sector, attained middle level of education, own mobile phone, are happy, more prosperous, and live in urban areas. The study collects a total of 22,361 samples, 6,394 of which are internet users. The internet use group is dominated by male, younger-aged, middle level of education-attaining, mobile phone-owning, urban resident, and economically more prosperous respondents.

Table 2. Descriptive statistics

Variable	All		Internet User		Non-internet User		Source
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
<i>Socio-Demographic Characteristics</i>							
Age	38.84	13.14	30.78	9.3	42.07	13.07	IFLS-5 (2014). reprocessed
Gender	0.42	0.49	0.52	0.5	0.42	0.49	
Job Status	0.75	0.43	0.76	0.42	0.75	0.43	
Education	1.81	0.66	2.28	0.55	1.62	0.61	
Marital status	0.87	0.34	0.79	0.41	0.89	0.30	
HP Ownership	0.72	0.45	0.98	0.14	0.62	0.49	
Internet use	0.29	0.45	1	0	0	0	
Level of wealth	47.98	15.9	55	13.76	45.17	15.83	
Level of happiness	51.03	14.22	57.22	12.35	48.55	14.17	
<i>Regional Characteristics</i>							
Urban/Rural	0.58	0.49	0.74	0.44	0.52	0.5	IFLS-5 (2014). reprocessed MCI (2014). reprocessed
Signal Strength	777	341.4	833.2	387.6	754.5	318.3	
<i>Social Capital</i>							
Social Capital Index (SCI)	59.15	8.42	58.53	9.32	59.39	8.02	Authors' calculation
Total Observation	22,361		6,394		15,967		

Note: Signal strength is represented by BTS Density (The number of BTS per 1 million population in one province)

4.2. Descriptive Analysis of Internet Usage

Table 3 presents the percentage of internet usage grouped by overall respondents, length or level of education (low, secondary, higher education), and region (urban/rural).

Table 3. Percentage of internet adoption based on education and region

	All	Internet User	Non-internet User
<i>Duration of Education</i>			
< 7 years	33.7%	5.1%	45.1%
7 – 12 years	52.1%	62.0%	48.1%
> 12 years	14.2%	32.9%	6.7%
Total	100%	100%	100%

	All	Internet User	Non-internet User
<i>Regional</i>			
Rural	41.5%	26.1%	47.7%
Urban	58.5%	73.9%	52.3%
Total	100%	100%	100%

Source: IFLS-5, reprocessed

Concerning the educational level of respondents, the highest percentage of internet adopter are those with a length of education of over 12 years, which is equivalent to those who have received Diploma level or beyond (S1, S2, S3). The lowest percentage of adoption is in the group with less than 7 years of education or elementary school level and its equivalents. This result is quite reasonable considering that those with higher education tend to have the necessary knowledge in operating the internet. The adoption of information and communication technology based on educational variables is in line with research that states that educational level influence people’s behaviour in adopting a technology (Leung & Wei, 1998).

In terms of regional characteristics, it can be seen that urban areas have a greater percentage of internet users than rural areas. This is due to the fact that the availability of better ICT infrastructure in urban areas is also related to awareness and digital literacy levels of urban communities which are higher compared to rural communities.

4.3. Descriptive Analysis of the Social Capital Index

4.3.1. Dimensions Forming the Social Capital Index

Table 4 displays the index dimensions creating the social capital index for the condition of internet users and not internet users.

Table 4: Dimensions of social capital index

Dimension	Overall		Internet User		Non-internet User	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dimension of collective actions and participatory Index	65.18	16.83	67.64	17.22	64.20	16.58
Dimension of social cohesion and inclusion Index	66.54	14.42	65.73	14.80	66.86	14.25
Dimension of trust and solidarity Index	47.80	13.49	49.87	12.51	46.97	13.78
Dimension of groups and networks index	59.75	21.50	52.35	25.29	62.72	18.99

a. Dimension of collective actions and participatory index

From Table 4 it can be seen that internet users have a higher index of collective and participatory action dimension compared to non-internet users, in other words, the internet use has a positive correlation with an increase of the index of the collective and participatory actions dimension.

b. Dimension of social cohesion and inclusion index

Dimension of social cohesion and inclusion is related to a sense of security in the community. The measurement results show that internet users have lower index values of social cohesion and inclusion dimensions than non-internet users. In other words, the use of the internet has a negative correlation with the increase of the index of social cohesion and inclusion dimension.

c. Dimension of trust and solidarity index

The dimension of trust and solidarity includes trust and tolerance for neighbours of different religions/creeds or ethnic groups. The measurement results show that internet users have a higher index

of trust and solidarity dimension when compared to non-internet users. In other words, the use of the internet has a positive correlation with an increase in the index of dimension of trust and solidarity.

d. Dimension of group and network index

The measurement results show that the level of community participation in participating in community activities in the surrounding environment is getting lower. We can further see that internet users have a lower index of group and network dimension compared to non-internet users. In other words, the internet use has a negative correlation with the increase in the index of group and network dimension. This reinforces the notion that current advances in information and communication technology make people less interested in participating in community gatherings or meetings. They prefer to channel their aspirations online, for example through social media such as Facebook, Twitter, and YouTube. Besides, they also tend to carry out a community discussion via *WhatsApp* group facilities that is relatively cheaper and can be carried out anytime and anywhere as long as it they have internet connection.

4.3.2. Social Capital Index based on Education, Region, and Internet Usage

The average social capital index of the whole sample is 59.15. If we separate internet users from non-internet users, we can see that internet users have an average social capital index of 58.53, which is lower than the average non-internet social capital index of 59.39. This condition will be confirmed by using regression analysis in the next section to see whether internet usage is indeed significantly negatively correlated to the social capital index.

Table 5. Recap of social capital index based on internet usage

	Overall SCI	SCI of Internet Users	SCI of Non-internet User
<i>Duration of Education</i>			
<7 years	58.94	57.46	59.00
7 - 12 years	58.88	57.39	59.65
> 12 years	60.62	60.85	60.15
<i>Regions</i>			
Urban	58.68	58.36	58.87
Rural	59.80	59.03	59.97

Sources: IFLS-5, reprocessed

In accordance with the research objectives, the next section will provide a more detail explanation on the social capital index of internet users and non-internet users based on educational level and their territorial location.

a. Social capital index based on education

Based on the length of education attained, a person with high education category (> 12 years) has a social capital index that is significantly higher than someone with a low or secondary level category of education. The study reveals an interesting finding that respondents with high education who are internet users have higher social capital index than non-internet users. In contrast, for respondents with low or secondary education category, social capital index of internet users is lower than non-internet users. Internet users with high education (> 12 years) have relatively advanced thinking, are wiser, and make most use the internet for something productive.

b. Social capital index based on region

Based on regional characteristics, people in rural areas have a higher social capital index than urban communities. Local culture's norms and values which are generally upheld by rural communities are considered to play an important role in the high index of social capital in rural areas. The attitudes of mutual trust and high tolerance to neighbours are adapted more by rural communities than urban communities. Likewise, a higher sense of security in rural areas, as well as community activities that

are still routinely carried out by most rural communities contributed to the index of social capital index of rural communities so that it is higher than the index of urban social capital. Furthermore, when viewed from the internet usage by urban and rural communities, the measurement results show that the social capital index of internet users both in urban and rural areas show lower index values when compared to non-internet users.

4.4. Empirical Result: OLS Estimation

OLS method is used to examine the effect of internet use variables (INT) and other control variables such as education (EDU), urban/rural areas (URAL), Age (AGE), gender (SEX), Job Status (JOB), Marital Status (MAR), mobile phone ownership (HP), signal strength (SIGN), welfare level (WEALTH) and happiness level (HAPPY), to the dependent variable social capital index (SCI). To test the consistency of the influence of the internet on social capital, this study compares the results of with and without control variables as presented in Table 6. The Table shows that the association between internet and social capital index are consistently negative in entire model specifications. The addition of control variables to the analysis increases the value of the coefficient of determination (*adj R²*), which indicates that the inclusion of control variables improves the estimated results.

The analysis also tests the effect of the independent variables on each of the four dimensional indexes of the social capital index, namely 1) the index of social cohesion and inclusion dimensions (IN_COHESION); 2) the index of trust and solidarity dimension (IN_TRUST); 3) the index of collective and participatory action dimensions (IN_ACT); and 4) the index of group and network dimension (IN_GROUP). The results are presented in the Table 7.

As described in the hypotheses, this study only provides a more detailed discussion to the variables of internet use, education, and regional characteristics to see how these variables affect the social capital index.

4.4.1. The Effect of the Use of the Internet on Social Capital

In general, the use of the internet has a significant negative correlation to the social capital index, indicating that internet users tend to have lower social capital than non-internet users. More clear illustration on the significance of the internet usage variable on the four-dimensional indexes of social capital is shown in Table 7.

Internet use has a significant positive correlation to the index of trust and solidarity dimensions (IN_TRUST) and the index of collective and participatory actions dimension (IN_ACT). This implies that the internet is able to increase mutual trust, solidarity, and community tolerance among different religions, beliefs, and ethnicities. The internet use also encourages collective and participatory actions. For instance, fund raising for natural disaster relief is carried out through online platform such as social media (Facebook, Twitter, YouTube, etc.), messaging applications (WhatsApp, Line, Telegram, etc.), and fundraising applications (kitabisa.com, rapid response, indo-volunteer, etc.).

On the other hand, internet use has a significant negative correlation to the index of groups and networks dimension (IN_GROUP). This implies that the use of the internet can potentially reduce the level of participation in groups and community activities. This happens because many face-to-face meetings can be replaced by online meetings by utilizing Whatsapp Group or Video Conference application, for instance. Likewise, patrols and *siskamling* (environmental security systems) can now be replaced by 24-hour non-stop CCTV cameras. This finding supports a study by Quan-Haase & Wellman (2001) and Shklovski(2006) which state that online interactions result in reduced interactions in the family, friendship groups, or close neighbors.

The results also show that the use of the internet does not have a significant correlation on the dimensions of social cohesion and inclusion (IN_COHESION). In other words, the use of internet causes social cohesiveness of the community to be maintained. For example, someone feels safe in the environment or feels secure when walking alone at night. However, the proliferation of negative information, hoaxes, expressions of hatred, terrorism, radicalism, and crime must still be monitored as they have potentials to reduce security, and trigger disintegration in the community.

Table 6. Comparison of estimated results with and without control variables

	SCI	SCI	SCI	SCI	SCI	SCI	SCI	SCI	SCI	SCI	SCI
INT	-0.861***	-1.606***	-1.436***	-1.355***	-0.365*	-0.605***	-0.571***	-0.0352	-0.181	-0.322*	-0.322*
EDU		1.126***	1.265***	1.285***	1.481***	1.486***	1.377***	1.215***	1.072***	0.993***	0.996***
URAL			-1.215***	-0.889***	-1.140***	-1.078***	-0.951***	-0.897***	-0.976***	-1.009***	-1.015***
SIGN				-0.00209***	-0.00210***	-0.00210***	-0.00205***	-0.00195***	-0.00197***	-0.00196***	-0.00196***
AGE					0.0943***	0.0859***	0.0813***	0.0873***	0.0978***	0.0984***	0.100***
SEX						1.388***	0.453***	0.348**	0.193	0.303*	0.312*
JOB							2.981***	2.697***	2.686***	2.699***	2.697***
MAR								3.469***	3.399***	3.382***	3.308***
HP									1.068***	0.971***	0.962***
WEAL										0.0233***	-0.0969***
HAPP											0.138***
_cons	59.39***	57.57***	57.98***	59.36***	55.21***	54.94***	53.36***	50.41***	49.73***	48.81***	47.55***
	(936.34)	(352.46)	(346.86)	(299.59)	(185.00)	(184.52)	(174.23)	(147.57)	(142.03)	(128.70)	(113.50)
N	22361	22361	22361	22361	22361	22361	22361	22361	22361	22361	22361
adj. R ²	0.002	0.008	0.013	0.020	0.038	0.044	0.064	0.083	0.085	0.087	0.089

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Tabel 7. Comparison of the estimated social capital index and the index of the social capital dimensions

	SCI	IN_COHESION	IN_TRUST	IN_ACT	IN_GROUP
INT	-0.322*	-0.372	1.602***	1.401***	-4.766***
EDU	0.996***	-0.489**	1.642***	1.574***	1.188***
URAL	-1.015***	-0.488*	0.195	0.863***	-5.307***
SIGN	-0.00196***	-0.000774**	0.00270**	-0.00185***	-0.00983***
AGE	0.100***	0.0924***	0.00518	0.0305**	0.315***
SEX	0.312*	6.301***	1.331***	-5.760***	-1.412***
JOB	2.697***	1.643***	0.275	3.464***	6.408***
MAR	3.308***	-0.314	0.963***	3.443***	10.54***
HP	0.962***	-1.018***	1.090***	3.079***	0.774*
WEALTH	-0.0969***	-0.301***	0.174***	-0.204***	-0.120**
HAPPY	0.138***	0.399***	-0.244***	0.352***	0.131**
_cons	47.55***	55.83***	43.60***	48.30***	42.65***
<i>N</i>	22361	22361	22361	22361	22361
adj. <i>R</i> ²	0.089	0.075	0.030	0.071	0.169

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.4.2. The Effect of Education on Social Capital

In general, samples' level of education is positively and significantly correlated to their social capital. It means that the higher the samples' level of education, the higher their social capital index. When examining the effect of education on each dimension of the social capital, it can be seen that education is positively correlated to the index of collective and participatory action dimension (IN_ACT), trust and solidarity dimension (IN_TRUST), and groups and networks dimension (IN_GROUP), but negatively correlated to the index of social cohesion and inclusion dimension (IN_COHESION). It means that the samples with higher level of education will have wiser pattern of thinking, higher sense of mutual trust, higher tolerance and social life. Additionally, their friendship and network will become more extensive so that it will provide more opportunities for someone to be active in social gatherings and organization.

However, why does education actually have a significant negative correlation to cohesion and inclusion index? The dimension of social cohesion and inclusion is related to one's vigilance and feeling of security in the community. For example, the feeling safe when walking alone in an area at night. The higher the level of one's education, in general, the more logic they will put considering every action, thus, affecting the feelings of worry, insecurity and alertness. This is in line with research by (Coplan et al., 2012) that found a correlation between anxiety and intelligence (IQ). The results showed that those who were diagnosed with anxiety disorders tended to have higher IQ levels.

To see the difference in the influence of the independent variable on the social capital index at 3 levels of education, namely low education level (<7 years), medium (7-12 years) and high (> 12 years), a separate regression is carried out. Table 8 presents the estimated results.

Table 8. Recap of OLS results based on education level

Variable	Low education SCI	Secondary education SCI	Higher education SCI
INT	-1.622**	-0.632***	1.187**
URAL	-0.908***	-1.096***	-1.916***
AGE	0.0231**	0.160***	0.114***
SEX	1.151***	0.552**	0.590
JOB	0.927***	1.260***	0.799**
MAR	-0.377***	0.164	0.318
HP	0.113	1.554***	3.628***
WEALTH	-0.0894***	-0.137***	-0.132**
HAPPY	0.130***	0.185***	0.165**
SIGN	-0.00231***	-0.00221***	-0.00129**
_cons	56.93***	49.73***	50.77***
<i>N</i>	7528	11653	3180
adj. <i>R</i> ²	0.043	0.094	0.048

t statistics in parentheses

* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Based on Table 8, it can be seen that all independent variables significantly influence social capital indexes. Independent variables of education, age, occupation, mobile phone ownership, and level of happiness have a significant positive correlation with social capital index. Meanwhile, the independent variables of internet use, gender, marital status, urban/rural areas, signal quality (BTS Density), and the level of welfare have significant negative correlations to the index of social capital. How these independent variables affect the social capital index can be more detailly observed by examining the effect of these independent variables on the dimensions of social capital as listed in Table 8.

The estimated results show that for low and secondary education levels, the use of internet (INT) has a significant negative correlation with social capital. In contrast, the internet use by those with higher education has significant positive correlation with social capital. These findings show that the use of internet by those with higher education will be able to increase their social capital compared to those with low or middle education. This is reasonable because people with higher education in general will use the internet more wisely, that is only for something useful and more productive. Meanwhile, regional characteristics (Urban/Rural) have a significant negative correlation with social capital for all levels of education, meaning that in general social capital in rural communities is higher when compared to in urban communities.

4.4.3. The Effect of Regional Characteristic on Social Capital

In general, regions (urban/rural) have a significant negative correlation to the social capital index, meaning that people in urban areas tend to have lower social capital when compared to that of the rural communities. Communities in rural areas in general have closer and deeper relationships. The kinship system and kinship groups still play an important role in rural communities (Soekanto, 1999). In addition, it is believed that rural communities remain upholding norms and values of local culture that play an important role in the higher index of social capital in rural areas.

If we look at the effect of regions on each dimension of the social capital (see Table 9), it can be seen that the regional characteristics are significantly and positively correlated to the index of collective and participatory actions dimension (IN_ACT), indicating that the collective and participatory actions, such as fundraising or social assistance for natural disasters, is higher in urban than in rural. This can happen because generally the economic ability of urban communities is better when compared to rural areas.

On the other hand, regions are negatively correlated significantly to the group and network dimension index (IN_GROUP), social cohesion and inclusion dimension index (IN_COHESION). These imply that that many rural communities maintain their active participation in several activities of community meetings and gatherings, such as social security, patrols, Village meetings, *Karangtaruna* (youth organization), and others compared to urban communities who are relatively busier with their work-related matters. The sense of security of a community is higher in rural areas than in urban areas. A person generally feels more secure of walking alone at night in rural areas compared to in cities that are usually more prone to crime. In addition, territorial characteristics do not have a significant correlation with the index of dimensions of trust and solidarity (IN_TRUST). This indicates that both rural and urban communities have relatively the same mutual trust, solidarity and tolerance between religious communities, beliefs , or ethnicities.

To closely examine each independent variable effect on the social capital index in urban and rural areas, two regressions are performed for urban and rural areas separately. Table 9 presents the results that show how far the difference in the two areas.

The estimated results show that for rural areas, all independent variables have a significant effect on the social capital index. Meanwhile, for urban areas, the internet use (INT) does not appear to have a significant effect on the social capital index. This occurs since the internet access in urban areas is far more equitable when compared to rural areas.

4.4.4. The Effect of the Interaction of Internet Variables with Education Variables and Internet Variables with Regional Variables on Social Capital

To observe the effect of interactions between variables of internet use with education and interactions between internet use and regions (urban/rural), this study includes the interaction of the variables into the analysis. The results are presented in the Table 10.

Table 9. Recap of OLS results by urban and rural area

Variable	Rural SCI	Urban SCI
INT	-0.618*	-0.0534
EDU	0.831***	1.020***
SIGN	-0.000134	-0.00225***
AGE	0.0765***	0.119***
SEX	0.787***	-0.0179
JOB	2.766***	2.660***
MAR	3.795***	2.981***
HP	0.737***	1.135***
WEALTH	-0.0998***	-0.0919***
HAPPY	0.150***	0.126***
_cons	46.53***	46.56***
<i>N</i>	9288	13073
adj. <i>R</i> ²	0.047	0.071

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10. Recap of comparison of estimated results without and with interaction effects

Independent Variable	Social Capital Index (SCI)		
	No Interaction Effect	Interaction between the Internet and Education	Interaction between the Internet and Region
INT	-0.322*	-2.517***	-0.427
EDU	0.996***	0.738***	0.997***
URAL	-1.015***	-1.001***	-1.051***
SIGN	-0.00196***	-0.00194***	-0.00196***
AGE	0.100***	0.0965***	0.100***
SEX	0.312*	0.350**	0.312*
JOB	2.697***	2.663***	2.695***
MAR	3.308***	3.271***	3.305***
HP	0.962***	1.010***	0.964***
WEALTH	-0.0969***	-0.0978***	-0.0969***
HAPPY	0.138***	0.138***	0.138***
INT*EDU		1.012***	
INT*URAL			0.151
_cons	47.55*** (118.50)	48.16*** (116.98)	47.57*** (118.32)
<i>N</i>	22361	22361	22361
adj. <i>R</i> ²	0.089	0.090	0.089

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Based on Table 11, it can be seen that by adding interaction variables between internet use variables (INT) with education variables (EDU) and interaction of internet use variables (INT) with urban/rural area variables (URAL), the effect of internet use on social capital (SCI) remains significant and negative, with a greater value of *Adj R*² than without the interaction effect. The interaction of internet use with educational variables (INT*EDU) which has a significant positive correlation to social capital shows that internet users with higher education will have a greater influence on social capital. Meanwhile, the interaction of internet usage with regional variables (INT*URAL) is not significant, implying that differences in internet users in rural and urban areas do not significantly affect social capital.

5. Conclusion

5.1. Conclusion

This study examines the effect of internet use on social life that is measured by the social capital index. The study is in line with the phenomenon of the internet in the community which is often considered to bring us closer to those who are far away, but separate us from those who are close.

Our study finds out that in general, the use of the internet has a significant negative correlation with social capital. In other words, the use of the internet will decrease the social capital index. The negative correlation is mainly caused by one of the social capital dimensions, namely the index of the group and network dimension. This dimension is one of the four dimensions of social capital that is significantly and negatively affected by the internet usage variable but has a major contribution to reducing the overall social capital index. This result is supported by the fact that today, community participation in community groups/activities is considered to be decreasing. Thus, it is thought to reduce social capital index, especially the index of group and network dimension.

The next finding is that in general, areas (urban/rural) have a negative correlation with social capital. In other words, the social capital of rural communities is higher than that of urban communities. Further analysis related to the use of the internet in each region category shows that internet use has a negative correlation to the social capital index of rural communities. In other words, the use of the internet can reduce the social capital of rural communities. Meanwhile, the internet use has no significant effect on the social capital index of urban community.

The last finding is that in general, samples' educational level has significantly and positively associated their social capital. The higher the respondents' educational attainment, the higher their social capital index. Likewise, internet users' educational level has empirically a significant positive correlation with social capital. Internet users with higher education have a higher social capital index than internet users with lower education.

5.2. Recommendation

The influence of the internet which is important for the economic and social life of the people makes the focus of the policy in increasing the distribution of internet penetration throughout the country become a priority program of the government. Data from the Ministry of Communication and Informatics shows an increase in the distribution of internet access development to remote areas of the country including disadvantaged, outermost, and frontier regions. However, ICT infrastructure development needs to be improved as the development is often not balanced with the development of human resources, so the utilization of the internet access provision program is still considered to be insufficient. The development of communication and information technology infrastructure carried out by the government should be followed by the development of human resources (digital literacy). Indonesian people are expected to have better readiness in accepting new technologies and to respond to the fast flow of incoming information, especially with the increasingly rampant negative information, hoaxes, speech hatred, terrorism, radicalism and cybercrime. The role of government is needed to educate the public about how to use the internet in a healthy, safe and wise manner. The readiness of human resources determines whether the internet will have a positive or negative impact on social capital, which in turn will contribute to national development.

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