

Refining Indicators for Measuring Social Capital Index

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The current study aims at identifying, validating and refining indicators for measuring social capital index by using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). These analyses were used to validate indicators in measuring social capital index. The indicators used for the analyses was based on several past empirical research that has been identified to have three main constructs: (1) understanding, cooperation and reciprocity, (2) norms and values, and (3) trust. A screening process was carried out to select the most relevant items. It was then verified by sociological and educational experts. The final list of indicators then was used as an instrument for collecting response from 166 participants in Malaysia. Data collected was analysed using Exploratory Factor Analysis and Confirmatory Factor Analysis. Results showed that only 23 indicators from three constructs are valid and reliable to be used. Results also suggest there are four new constructs emerged for measuring social capital index. All of the 23 indicators have been identified and rearranged into four new constructs that are (1) collective action, (2) identification and confidence, (3) beliefs and (4) trust. These indicators are valid and need to be given attention in measuring social capital index.

Key words: *validity, exploratory factor analysis, confirmatory factor analysis, reliability analysis, social capital index.*

Introduction

Current research on social wellbeing in various countries has been moved from socio-economic, prosperity and poverty of community towards socio-networking and socio-relationships of people that make them happy and well. This highlights the importance of researching the social capital index of people in many countries. One of prominent

institutions that is focusing on measuring people's wellbeing by taking into account social capital index is The Legatum Prosperity Index. In 2018, the Legatum Prosperity Index ranked Malaysia in 27th place in the social capital index. The ranking was based on the measurement of socio-networking of people in Malaysia including the strength of personal relationships, social network support, social norms and civic participation. Put simply, it is dependent on the quality of social interactions (Mohd Mahzan Awang, et.al, 2014). These indicators are used by the Legatum Institute to measure the level of social capital index in the countries that participated. It is important to highlight that there are many social capital elements coined by scholars. However, it seems to be a lack of verification and validation analyses carried out systematically. Therefore, the current study aims at identifying and validating the social capital indicators.

Concept of Social Capital

The concept of social capital has been discussed in many sociological research and economic studies worldwide. Despite various definitions of social capital, the main premise remains the same which is that social capital is the network of the relationship and resources that enforces the community to solve the problem collectively (Nia Imani Fields, 2017). The concept of social capital has a close connection with the concept of effects and consequences of social relations and human interactions and also it has a link with the forms of human relationships as well as social structure. This means that the concept of social capital is not something new. Durkheim, Marx, and Weber discussed this concept hundreds years ago and it has been continually discussed by recent scholars including Bourdieu, Coleman and Putnam. Putnam (1995) defines social capital as the characteristics of social institutions, that have characteristics as follows: networks, norms, and beliefs, that facilitate the co-ordination and co-operation for the sake of common interest. The common elements of social capitals include interpersonal relationships, shared sense of identity, shared understanding, shared norms, shared values, trust, co-operation and reciprocity. Durston (1999) defines social capital as a set of norms, institutions and organisations that promote trust and co-operation among persons in communities, and also in wider society. Ostrom and Ahn (2003) stated that, social capital is an individual's trait that enhances their ability to solve problems by taking action collectively, which has multiple forms of social capital, namely trustworthiness, networks and institutional context. An individual's contribution made in terms of time, efforts and expenditure, to promote cooperation with others (Oxoby, 2009) has helped the infusion of values to create unity (Anita Abu Hassan, et. al, 2014). Thus, it is not weird to assume social capital as the resources that are available to the members of social group (Berkmann & Kawachi, 2000; Framke, E. et.al, 2019; Wind & Villalonga-Olives, 2019). Thus, the need to build a firm understanding among community is important to understand the effect of social support (Mohd Mahzan Awang, et.al. 2014).

Social capital could work through various channels either inward looking networks or outward-looking networks (Putnam, 2000; Mohd Mahzan, 2013). This information states that the concept of social capital has a wide range of elements including trust, reciprocity, information and co-operation associated with social networks. These elements will create values for the people who have social connections and relationships (Bourdieu, 1986; Coleman, 1988; Putnam, 2000; Mohd Mahzan et.al, 2013). Social capital is a resource that is seen as an investment in getting new resources. Resources are something that can be used, saved or invested and is referred to as capital. According to Morrow (1999), social capital is an event that occurs repeatedly and becomes a daily practice that provides a hint and a useful understanding of social capital in the daily life. Social capital is referring to the dependence of communities on one another for the sake of progress or sustainability in the community. Social capital can be seen in a scope of activities where people work together in partnership with local communities (Hersugondo, H. et.al, 2019). Thus, local community's engagement and support are fundamental socio-cultural elements to improve the social network (Abdul Razaq Ahmad & Mohd Mahzan Awang, 2016). It will be a norm of self-created values and cultures known as cultural capital.

The dependence of an organisation's quality on how communities, economies, and politics provide support for child development is seen to play an important role in the everyday life of a society. Bourdieu (1986) explains that a group's social capital strength is based on the quantity or quality of the established network of relationships, and along with that, a large amount of economic capital and cultural capital are owned by the group. Therefore, it is not surprising that the debate on social capital is the focus of research and development of ideas on social capital to be the names of some of the works of great thinkers such as Robert D Putnam (1993,1995), Francis Fukuyama (1992, 1995, 1999, 2000), Pierre Bourdieu (1983, 1989), James Coleman (1998) and others.

Common Indicators of Social Capital Index

In measuring social capital index, the common indicators as coined by Putnam (2000) are (i) networks, (ii) norms, and (iii) beliefs, which facilitate coordination and cooperation for common interests. Social capital index according to Putnam (2000) is an important factor that will effectively provide a function to social groups that have interpersonal relationships, including: (i) Shared Sense of Identity, (ii) A Shared Understanding, (iii) Shared Norms, (iv) Shared Values, (v) Trust, (vii) Cooperation, and (vii) Reciprocity. According to Portes and Landolt (1996), social capital indicator index can be measured by looking at cases, social capital could be a barrier to individual actions and preferences and hinder others from accessing resources. Putnam's Social Capital theory (2000) highlighted the importance of two constructs of social capital that are bonding social capital and bridging social capital.

Bonding social capital refers to the relationships within groups, groups or communities that share the same characteristics of various aspects, such as demographics, attitudes, information and resources obtained. Bonding social capital is linked to people based on a sense of common identity such as family, close friends and people who share our culture or ethnicity. Meanwhile, bridging social capital is the relationships across geographical, social, cultural and economic lines providing access to important resources, introducing new ideas, people and a way of life. Thus, bridging social capital links beyond a shared sense of identity, for instance to distant friends, colleagues and associates. The World bank (2000/01) has added another construct in measuring social capital index that is linking social capital. Linking social capital is a "...norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalized power or authority gradients in society". This means that linking social capital is linking various resources that are able to be linked between/within people or groups locally and globally. This type of connection is thought to enable production of higher levels of innovative work behaviour (Sugeng Wahyudi, et.al, 2019) which can contribute to greater productivity (Putu Agus Indrawan & Andriani E. Lay, 2019).

Objective

The current study aims at identifying, validating and refining indicators for measuring social capital index by using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Methodology

The current study utilises the survey research design. It has three main stages:

Stage 1: Identifying Social Capital Indicators

In order to identify social capital indicators, a reference has been made based on Putnam's work (2000), where he used three main constructs of social capital namely, i) Understanding, Co-operation and Reciprocity, ii) Norms and values and iii) Trust.

Table 1: Social capital framework

Constructs	Components	Explanation
Understanding, Cooperation and Reciprocity	Ability to understand, helping others and the feel of return on expectation.	Capable to understand to the role playing in the group Capable to give hands to the members in need. Committed to do the mission given by the group/institutions to achieve goal. Ready to listen to others' point of view.
Norms and values	Ability to respect the values and norms in groups or institutions.	Capable to respect the norms/rules in group/institutions.
Trust	The trust of the public in activities of institutions.	Capable to trust members in terms of economics resources.

Source: Adapted and modified from Putnam (2000)

Putnam also has identified seven indicators of social capital that are (i) Shared Sense of Identity, (ii) A Shared Understanding, (iii) Shared Norms, (iv) Shared Values, (v) Trust, (vi) Cooperation, and (vii) Reciprocity. These constructs and indicators were reviewed and agreed upon by three experts in sociology and educational studies. All the indicators were included as items in instruments. It should be noted that all the items were written in dual language as it is aimed at all Malaysians, since Malaysia was known for their multi-ethnic races. Thus, in order to ensure the accuracy of all items, all items were checked by language experts. Overall, the components of social capital were used as instruments.

Stage 3: Survey

A survey was carried out involving 166 Malaysians using a random sampling technique. This technique is appropriate to be used as the respondents have an equal chance of being selected as a sample without any bias judgement. Although there are ongoing debates regarding an appropriate sample size to validate new instruments, Johansson and Brooks (2010) suggest that "...30 representative participants from the population of interest is a reasonable minimum recommendation for a pilot study where the purpose is preliminary survey or scale development". Indeed, Malhotra (2007) suggest that 15 - 30 participants is sufficient for identifying the validity scores and reliability of a new instrument. Based on those recommendations, 166 Malaysian respondents were randomly chosen for the current study. As the current study aims at validating the indicators for measuring social capital index, results from this stage are significant for measuring social capital index.

Stage 4: Data Analysis

Data that had been gathered from the survey were then were analysed using SPSS focusing on the use of Exploratory Factor Analysis and Confirmatory Factor Analysis.

Results

Factor Analysis

A factor analysis was carried out to test the identified indicators for measuring social capital index. In order to analyse the valid items for each component, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity have been carried out. Kaiser-Meyer-Olkin (KMO) and Bartlett's test of Sphericity were conducted to exploratory factor analysis. Table 2 shows that KMO test resulted in a value of 0.923. This value was above the cut-off level of 0.5 as stated in Tabachnick and Fidell (2001), indicating that the sample was adequate enough to test factor analysis.

Table 3 shows that there are four components (constructs) for measuring social capital index. Results show that there are 10 items are measuring various components. The following items are found to be in various groups: C3_3, C3_4, C3_5, C3_6, D5, E1, E2, E3, E4, and E6. This indicates that the item is not valid to measure the construct (component). Indeed, the r values for most items are weak. In order to ensure the items are mainly measuring the constructs, only the items that are grouped in one component/group are supposed to be considered. In order to carry out exploratory factor analysis, the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity have been carried out for the second time.

Table 2: KMO and Bartlett's Test for all items

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.923
Bartlett's Test of Sphericity	Approx. Chi-Square df Sig.	3788.236 406 .000

Table 3: Pattern matrix for all items

Items	Components/Constructs			
	1	2	3	4
C1_1	0.972			
C1_2	0.895			
C1_3	0.895			
C1_4	0.871			
C1_5	0.861			

C1_6	0.860			
C1_7	0.848			
C2_1	0.828			
C2_2	0.814			
C2_3	0.814			
C2_4	0.813			
C2_5	0.761			
C3_1	0.738			
C3_2	0.663			
C3_3	0.655			0.314
C3_4	0.642			0.251
C3_5	0.505		0.343	
D1		0.842	-0.227	
D2		0.822		
D3	0.240	0.755		
D4		0.750		
D5		0.705	0.288	
D6			0.899	
E1			0.764	0.357
E2	0.310		0.722	
E3	0.233		0.556	
E4	0.387		0.472	
E5				0.737
E6				0.648

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Data Reduction

Data reduction is required to ensure the most relevant items for each component (construct) of social capital index. Table 4 shows the results of Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of sphericity after the data reduction. All 10 items are removed from the list as it measures various constructs/components. After data reductions, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of sphericity were again conducted to exploratory factor analysis. Results showed that the KMO test is 0.898 indicating that the sample was adequate to test factor analysis.

Table 4: KMO and Barlett's Test after data reduction

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.924
Bartlett's Test of Sphericity	Approx. Chi-Square df Sig.	3049.220 253 .000

Table 5: Pattern matrix after data reduction

Items	Components/constructs			
	1	2	3	4
C1_1	0.957			
C1_2	0.908			
C1_3	0.893			
C1_4	0.880			
C1_5	0.875			
C1_6	0.862			
C1_7	0.857			
C2_1	0.845			
C2_2	0.838			
C2_3	0.811			
C2_4	0.775			
C2_5	0.749			
C3_1	0.667			
C3_2	0.666			
C3_3	0.580			
D1		0.950		
D2		0.798		
D3		0.649		
D4		0.528		
E1			0.890	
E2			0.827	
E3			0.741	
E5				0.863

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 5 shows that although there are for four constructs of social capital index based on the pattern Matrix, there is only one indicator for construct 4. This means that the fourth

construct requires further research in order to get a sufficient indicator for a new construct. Results demonstrated that are 23 items and four constructs are found to be valid for measuring social capital index. In order to check the reliability of all items, two statistical analyses were carried out that are Item-total correlation and Inter-item correlation.

Reliability Analysis

Table 6 shows that all the items are statistically correlated where the values for overall Cronbach's Alpha is 0.946. Detailed analysis on item-total correlation revealed that all the items are statistically correlated where the minimum value for Cronbach's Alpha if Item Deleted is 0.941 and the highest value are 0.954. According to George and Mallery (2003), Cronbach's alpha coefficients of less than 0.60 are considered low and unacceptable, between 0.60 and 0.80 are acceptable and above 0.80 are considered good. Generally, the value used is the Cronbach's alpha value above 0.60 and is considered to have a good reliability index.

Table 6: Item-total correlation

Item	Scale mean if item deleted	Scale variance if item deleted	Correlated item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
C1_1	87.1304	151.427	0.753	.	0.942
C1_2	87.1304	150.964	0.785	.	0.942
C1_3	87.2050	149.914	0.825	.	0.941
C1_4	87.1491	150.853	0.769	.	0.942
C1_5	87.0807	150.275	0.815	.	0.941
C1_6	87.1366	150.119	0.834	.	0.941
C1_7	87.1429	151.836	0.798	.	0.942
C2_1	87.1801	152.024	0.747	.	0.942
C2_2	87.3043	152.776	0.677	.	0.943
C2_3	87.1988	153.060	0.755	.	0.942
C2_4	87.2112	151.718	0.813	.	0.942
C2_5	87.4099	149.331	0.677	.	0.943
C3_1	87.2112	151.818	0.807	.	0.942
C3_2	87.2981	152.298	0.736	.	0.942
C3_3	87.2795	151.915	0.699	.	0.943
D1	87.3043	155.651	0.534	.	0.945
D2	87.2547	153.591	0.501	.	0.946
D3	87.1491	153.928	0.719	.	0.943
D4	87.2795	153.203	0.706	.	0.943
E1	87.7640	164.231	0.058	.	0.954

E2	87.5342	158.988	0.304	.	0.949
E3	87.3478	155.641	0.547	.	0.945
E5	87.6273	157.548	0.362	.	0.948

Table 7 shows that all items are significantly correlated related. This means that the items are reliable to be used in measuring social capital.s

Table 7: Inter-correlation matrix

	C1_1	C1_2	C1_3	C1_4	C1_5	C1_6	C1_7	C2_1	C2_2	C2_3	C2_4	C2_5	C3_1	C3_2	C3_3	D1	D2	D3	D4	E1	E2	E3	E5	
C1_1	1.00																							
C1_2	.825	1.00																						
C1_3	.747	.812	1.00																					
C1_4	.654	.662	.754	1.00																				
C1_5	.752	.701	.735	.848	1.00																			
C1_6	.722	.700	.757	.809	.861	1.00																		
C1_7	.670	.708	.780	.692	.756	.828	1.00																	
C2_1	.605	.611	.637	.577	.660	.715	.701	1.00																
C2_2	.555	.561	.496	.468	.532	.543	.518	.549	1.00															
C2_3	.639	.645	.617	.587	.679	.593	.600	.653	.722	1.00														
C2_4	.636	.655	.728	.657	.708	.688	.713	.725	.641	.705	1.00													
C2_5	.493	.559	.626	.586	.642	.677	.631	.618	.476	.554	.731	1.00												
C3_1	.647	.674	.687	.678	.718	.709	.690	.638	.537	.717	.701	.622	1.00											
C3_2	.549	.565	.607	.555	.624	.607	.638	.573	.580	.654	.626	.523	.611	1.00										
C3_3	.470	.540	.600	.552	.594	.626	.589	.617	.577	.554	.662	.579	.621	.574	1.00									
C3_4	.300	.371	.346	.322	.363	.343	.366	.395	.406	.383	.425	.327	.394	.405	.415	1.00								
D1	.320	.338	.377	.360	.336	.410	.330	.378	.346	.401	.331	.289	.302	.321	.328	.582	1.00							
D2	.553	.536	.604	.558	.589	.662	.590	.580	.436	.534	.572	.488	.608	.534	.494	.495	.604	1.00						
D3	.529	.575	.611	.539	.532	.629	.584	.491	.444	.474	.495	.409	.585	.560	.442	.530	.495	.685	1.00					
D4	.060	.063	.072	0.01	0.40	.006	.026	.016	.170	.086	.076	.034	-.003	.062	.117	.215	.017	.007	.091	1.00				
E1	.226	.204	.196	.215	.163	.210	.177	.180	.191	.187	.195	.114	.213	.253	.154	.259	.284	.232	.276	-.071	1.00			
E2	.353	.397	.416	.344	.372	.387	.402	.346	.382	.323	.415	.237	.394	.389	.364	.325	.411	.457	.456	.045	.570	1.00		
E3	.222	.257	.361	.297	.247	.238	.224	.203	.235	.237	.280	.234	.296	.295	.236	.183	.187	.186	.330	-.070	.447	.543	1.00	

*Significant at the level 0.05 (note: the values in the table are referred to r values)

Discussion

Analysis from this study suggests that are only 23 items (indicators) that are valid for measuring social capital. All the 23 items (indicators) are grouped into four new constructs. We conclude that four new constructs emerged from the data (that have to be considered based on the current study) are: (1) Collective Action, (2) Identification and Confidence, (3) Internal Trust and (4) External Trust. Detailed items (indicators) under these four new constructs are as follows:

Construct 1: Collective Action

- C1_1 - Ability to respect group's or institutions' rules
- C1_2 - Ability to understand a group's goal.
- C1_3 - Committed to do activities with a group to achieve a goal.
- C1_4 - Ability to carry out a task.
- C1_5 - Ability to understand the role in institutions.
- C1_6 - Ability to fulfil group's need.
- C1_7 - Ability to understand others' point of view
- C2_1 - Ability to cooperate with others.
- C2_2 - Willingness to give a hand to members' in need.
- C2_3 - Ability to take action together with a group to achieve a goal.
- C2_4 - Positive attitudes in groups' cooperation.
- C2_5 - Ability to manage activity to achieve a goal.
- C3_1 - Helping the members' in need.
- C3_2 - Return on expectation.
- C3_3 - Ability to join group's activity.

Construct 2: Identification and Confidence

- D1 - Ability to understand groups' principles.
- D2 - Proud with the groups' symbol.
- D3 - Ability to adapt to groups' rules.
- D4 - Confidence to point out own points of view.

Construct 3: Internal Trust

- E1 - The need to be alert with people at surrounding.
- E2 - Ability to trust people.
- E3 - Negative attitude in terms of lending some money.

Construct 4: External Trust

- E5 - Positive attitude in trusting everyone.

These indicators were seen to support the study of social capital in Malaysia where it was found that the contributors to social capital are as follows: participation in community activities, proactivity in the social context, neighbourhood connections, multi-racial tolerance, a sense of trust and protection, and life values (Najib Ahmad Marzuki, et.al. 2014).



The current study has contributed to the study of social capital by highlighting the importance of collective action, identification and confidence, beliefs and trust.

Conclusion

Overall, the results from this analysis indicate that the elements of social capital theory proposed by Putnam (1995) is valid but the constructs and indicators require new cluster arrangements. This is due to the statistical analysis results from the current study showing that the indicators are gathered in four new constructs. Indeed, 15 items are found to be gathered in the new construct namely Collective Action. It may be fair to state that the indicators included in the instruments from this study are suitable to be used for measuring the social capital index. As the current study focuses mainly on understanding, cooperation, reciprocity, norms and values and trust, then the future research on this topic has to consider the domains of all major components stated by Putnam (1995): shared sense of identity, a shared understanding, shared norms, shared values, trust, cooperation, and reciprocity. Qualitative studies may also helpful in identifying new constructs and items for measuring social capital index.

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Author's Contribution and Ethics

The indicators introduced in this paper are based on data collected in Malaysia. The indicators presented in this paper are useful to be used in developing instruments for measuring social capital index. It may be fair to state the participants were voluntarily involved in this project. There is no major ethical issue from this paper.



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Appendix

Social Capital Inventory

Part A: Demographic of Respondents

- Gender ● Age ● Ethnicity ● Religion ● Employment Status ● Academic Background

Part C: Understanding, Cooperation and Reciprocity

C1: Understanding

- C1_1 understand the rules set out at the institution / group / association ● C1_2 clear with the direction of group / association ● C1_3 committed to ensure the activities of groups / association can be achieved successfully ● C1_4 carry out well the assignment on the basis of the responsibility ● C1_5 understand the role in the institution ● C1_6 work to meet the needs of the group / association ● C1_7 understand the ideas raised by other group members during the discussion.

C2: Cooperation

- C2_1 contribute time to community projects ● C2_2 members of the community are willing to help if needed ● C2_3 undertaking joint action to achieve the goals of the group / association. ● C2_4 work together in the activities of the group / association ● C2_5 managing some of the activities in enhancing members' co-operation



C3: Reciprocity

- C3_1 often assisted by experts in groups / associations as I assist them
- C3_2 easy to get help from a friend when need it.
- C3_3 manage activities that benefit friends in groups / associations
- C3_4 joined the group / association to get a reward / benefit
- C3_5 emphasize the concept of mutual help in ensuring the goals of my group / association are achieved

Part D: Norms and Values

- D1 the group / association has clear rules or principles
- D2 The group / association I join has its own symbol / symbol
- D3 customize my behavior with the rules or principles of the group / association I join.
- D4 feel free to speak if I do not agree with what others have agreed upon
- D5 multiculturalism makes life better
- D6 took the initiative to do what to do without being asked by anyone at work place,

Part E: Trust

- E1 alert or someone is likely to take advantage of you.
- E2 Most people in this community can be trusted
- E3 Most members of this community, do not trust each other in terms of loans and borrow money.
- E4 believe in public and private institutions
- E5 Generally, I feel that most people can be trusted.
- E6 could rely on my colleagues to carry out my duties.