Does Internet Usage Stimulate the Accumulation of Social Capital? A Panel İnvestigation for Organization of Economic Cooperation and Development Countries

Mohammad Salahuddin[1]*, Khorshed Alam[2], Lorelle Burton[3]

[1]School of Commerce, University of Southern Queensland, Toowoomba, QLD 4350, Australia, [2]School of Commerce, University of Southern Queensland, Toowoomba, QLD 4350, Australia, [3]Psychology and Counselling, University of Southern Queensland, Toowoomba, QLD 4350, Australia. *Email: salahuddin.mohammad@usq.edu.au

ABSTRACT

This study estimates the effects of the Internet and economic growth on the accumulation of social capital (measured by trust) using panel data for 19 Organization of Economic Cooperation and Development (OECD) countries for the period 1985-2012. A cross sectional dependence (CD) test is performed. Having found the cross sectional dependence, a cross-sectionally augmented IPS (CIPS) unit root test is conducted to check for stationarity of data. All the variables were found first-difference stationary. Pedroni cointegration test confirms the presence of long-run relationship among the variables. This follows the application of pooled mean group regression technique to estimate the short- and long-run association between the variables. The findings suggest a highly significant negative long-run relationship between Internet usage and social capital and a positive relationship between them in the short-run. However, both long-run and short-run coefficients are small in magnitude. Economic growth stimulates social capital both in the short- and the long-run. That the Internet reduces social capital in the long-run implies that the gains in trust obtained from online connectivity were perhaps offset by the loss in the same due to decline in frequency of offline interaction caused by increasing online engagement. Economic growth stimulates activities in markets that engage into more frequent transactions between businesses that may result in increased trust. Finally, the findings of this study do not rule out the potential of including social capital issue into the digital divide policies of these countries.

Keywords: Economic Growth, Internet Usage, Organization of Economic Cooperation and Development, Panel Data, Social Capital
JEL Classifications: C23, F43, O

1. INTRODUCTION

Internet use grew at a phenomenal speed in the Organization of Economic Cooperation and Development (OECD) countries over the last two decades (Zhang, 2013). As a general purpose technology (Cardona et al., 2013), the internet has been able to affect every sector of the economy and as such, played a significant role in transforming economies of this region (The OECD Economic Outlook, 2013). Almost all the OECD countries have invested billions of dollars for the roll out of this amazing technology (OECD Internet Outlook, 2013). But such massive expansion also resulted in various forms of social inequalities - a phenomenon commonly referred to as digital divide. Initially the concept of digital divide was meant to understand the difference between those who have access to the Internet and those who don't

(OECD, 2001). With the passage of time, various forms of other divides such as education divide, skill divide, speed divide, net generation divide and group divide (so called cyber balkanization) have been emerging.

While access divide is declining within OECD countries (OECD, 2013), it still persists between countries in the region. Nevertheless, with rapid expansion of Internet infrastructure, other forms of divide have been emerging and haunting the digital landscapes of this region. The presence of these various forms of digital divide undermines the economy-stimulating potential of the Internet (Vicente and Lopez, 2011). However, the Internet itself may be able to reduce digital divide through its potential to generate social capital (Bauernschuster et al., 2014). Charlson (2013) suggests that enhancing empowerment and social

capital through Internet network for those already burdened with disadvantage and marginalization could be a potential mean to narrow digital divide.

The World Bank (2005) defined social capital as 'the norms and networks that enable collective action. It referred to the institutions, relationships and norms that shape the quality and quantity of a society's social interactions'. Recognizing the potential of the internet to generate social capital, recent studies (Kyujin, 2013; Antoci et al., 2012; Ferreira-Lopes et al., 2012; Lippert and Spagnolo, 2011; Notley and Foth, 2008; Foth and Podkolicka, 2007; Fernback, 2005; Hopkins, 2005; Meredyth et al., 2004) on digital divide have recommended the inclusion of social capital issue into the digital divide policy of a country. Whether or not the social capital issue should be included into the digital divide policies of the OECD countries, it is important to investigate first of all, if the Internet really generates social capital in the region at macro level. While there is presence of digital divide in OECD region (Zhang, 2013) and that the Internet has the potential to generate social capital -these two factors underlie the key motivation for this investigation. This study makes a novel contribution by undertaking this investigation as it is believed that such important empirical exercise is the first of its kind for OECD region.

The rest of the paper is structured as follows: Section 2 gives a brief presentation on the concept and measurement of social capital. Section 3 provides a relevant literature review, and the methodology used in this empirical analysis is presented in Section 4. Section 5 reports the empirical results and the conclusions and policy implications of the research are given and discussed in Section 6.

2. AN OVERVIEW OF THE CONCEPT AND MEASUREMENT OF SOCIAL CAPITAL

The term "social capital" was first coined by Hanifan (Putnam 2000, p. 443) who highlighted the importance of the social structure of the people within the spheres of business and economics. The concept was later popularized by Bourdieu (1980; 1986), Coleman (1988, 1990) and Putnam (1993; 1995; 2000). Coleman (1990) defined social capital as ". social organization that constitutes social capital, facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at a higher cost".

In their seminal work, Making Democracy Work, Putnam et al. (1993) defined social capital "as the collective values of all social networks and the inclinations that arise from these networks to do things for each other." Also he viewed social capital as encompassing features such as trust, social norms and networks that can improve the efficiency of the organization of society by facilitating coordinated actions. Given this point of view, Putnam et al. (1993) used indices of civil society and political participation to measure the stock of social capital.

However, the nature of the empirical literature on the measurement of social capital is very broad. One of the most recent studies

(Righi, 2013) recommended that social capital should be measured by three main attributes: Generalized trust, the intensity of the associative links, and civic and political participation expressed in various ways. A recent meta-analysis (Westlund and Adam, 2010) covered 65 studies on social capital and social capital related issues and insisted that more than 90% of the studies used trust as the proxy variable for social capital. It is expected that higher levels of Internet use would lead to denser social networks resulting in the increased level of trust. Until the multidimensionality of the concept of social capital is resolved, trust appears to be the most ideal indicator of social capital. This is so far a major weakness of most of the social capital studies.

3. LITERATURE REVIEW

3.1. Internet Use and Social Capital: Theoretical and Empirical Perspectives

The arrival of the Internet technology resulted in a significant expansion of network communication (Wellman, 2001; Castells, 2000). Internet usage is potentially able to generate social capital through facilitating networks of relations between different people and different communities (Lippert and Spagnolo, 2011). It is recommended that through digital inclusion of the disadvantaged people in rural and regional areas, a successful digital divide policy should include social capital framework in its agenda (Notley and Foth, 2008). There has been significant increase in the use of various social network sites (SNSs) since recent times which continue to affect our social, political and economic lives (Ferreira-Lopes et al., 2012). There are at least three reasons to suspect that web-mediated social participation generates social capital (Antoci et al., 2012). Online interactions contribute to the accumulation of Internet social capital. A salient feature of this capital is that it allows asynchronous social interactions; one can benefit from another's participation through the act of communication a message or posting a photo even when the person who did this is offline. Internet social capital also benefits internet non-users by the information spill-over. It was suggested (Kyujin, 2013) that online social network services supported by ICT policy relate to social capital.

Earlier studies also (Meredyth et al., 2004; Hopkins, 2005; Fernback 2005; Foth and Podkalicka, 2007) addressed the potential of the Internet to generate social capital These studies concluded that ICT use can have a positive impact on an individual's social inclusion and on a community's collective social capital. Selwyn and Facer (2007) argue that ICT lies at the heart of most of the activities that are seen to constitute "social inclusion" - from playing an active role in one's neighborhood and community to maintaining one's personal finances.

Simpson (2005) emphasizes the interplay between physical infrastructure, soft technologies and social capital for successful implementation, widespread uptake, greater social inclusion and the sustainability of ICT initiatives. Servon (2002) perceive technology as a tool of inclusion or exclusion. She notes that technology includes certain classes of people while excluding others. DiMaggio and Hargittai (2001) argue that Internet builds social capital by enhancing the effectiveness of community-level voluntary associations.

The possible relation between the Internet and social capital was also explained in what is known as "network society thesis" (Barney, 2004; Castells, 2000). The central idea of "network society thesis" is that contemporary social, political and economic practices, institutions and relationships are organized through and around network structures (Barney, 2004; Castells, 2000). The "network society thesis" is a useful tool to understand new forms of internet use.

It is within the "network society thesis" framework that social inclusion and social capital offer policy frameworks through which the current digital divide could be bridged addressing the online needs of specific disadvantaged groups and ensuring that all citizens with online opportunities lead to the formation of social, cultural and economic capital (Notley and Foth, 2008).

In summary, the above review reveals that despite importance of Internet-social capital association from the perspectives of massive growth in Internet use and the subsequent presence of different forms of digital divide, such an association was absolutely unexplored to date for OECD region. This study fills in this research gap.

4. METHODOLOGY

4.1. Data
Annual time series data on real GDP per capita growth rate and Internet users per 100 people for the period of 1981-2013 for 19 OECD countries[1] are obtained from the World Data Bank (previously, World Development Indicators database, The World Bank, 2014). Since trust is recognized as the most prominent dimension of social capital (Fukuyama, 1995a, b; Knack and Keefer, 1997; Glaeser et al., 2000; Zak and Knack, 2001; Ng et al., 2014), the current study uses trust as the indicator for social capital. Data on trust for OECD countries were gathered from the World Values Survey (WVS, 2014) conducted in multiple waves from 1981 to 2014. Missing values of trust variable were obtained through linear interpolation of data. Trust is measured as the percentage share of people who answer that "most people can be trusted" to the WVS survey question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Trust data are available only for 19 out of 34 OECD countries. As such, 15 OECD countries are dropped from the study. The variable economic growth is taken from the growth rates in real GDP per capita (GDPC) which was measured at constant 2005 US$.

4.2. The Model
To test the hypothesis that the Internet generates trust (a proxy of social capital), we estimate an econometric model where social capital measured by trust (SC) is assumed to be a function of number of internet users per 100 people (NET) and real GDP growth rate (GDPCG). This model is based on the assumption that the Internet and economic growth stimulate trust. Higher economic growth is associated with higher level of transactions in an economy which

may work to strengthen trust among the actors in the economy which is likely to enhance the overall level of trust. Therefore, the functional form of the estimated model in this study is:

$$SC_{it} = \beta_0 + \beta_1 \, NET_{it} + \beta_2 \, GDPCGC_{it} + \varepsilon_{it} \tag{1}$$

The subscripts i and t represent the country and time respectively.

4.3. Estimation Procedures
The estimation of our model proceeded as follows: (i) A cross-sectional dependence test was conducted to detect its presence, (ii) the stationarity of data was checked by an appropriate panel unit root test (CIPS), (iii) presence of unit root enforced the Pedroni cointegration test to verify long run relationship among the variables and (iv) pooled mean group (PMG) estimation technique was applied to examine the short-run and long-run relationship among the variables.

4.3.1. Tests for unit roots
Usually in panel data, there is likelihood of the threat of cross sectional dependence across the panel. To verify its presence and to consider it in the unit root test procedures, a cross-sectional dependence (CD) test developed by Pesaran (2004) was conducted. Pesaran (2004) defined CD statistic as:

$$CD = \left[\frac{TN(N-1)}{2} \right]^{1/2} \bar{\bar{\rho}}$$

Where:

$$\bar{\bar{\rho}} = \left(\frac{2}{N(N-1)} \right) \Sigma_{i=1}^{N-1} \Sigma_{j=i+1}^{N} \hat{\rho} ij$$

In which $\hat{\rho} ij$ is the pair-wise cross-sectional correlation coefficients of residuals from the conventional augmented Dickey–Fuller regression, T and N are sample and panel sizes respectively.

Having found the cross sectional dependence across the panel, next, a cross-sectionally augmented IPS (CIPS) unit root test is performed. The test statistic provided by Pesaran (2007) was given by:

$$CIPS(N,T) = N^{-1} \sum_{i=1}^{N} t_i \, (N,T)$$

Where t_i (N, T) is the t statistic of β_i in Equation (2). The critical values of CIPS (N, T) are provided in Table 1 of Pesaran (2007).

4.3.2. Panel cointegration test
The presence of cointegrating relationship is an indication of the possibility of long-run relationship between variables as evident from the CIPS results (Table 1). This enforced conducting panel cointegration tests suggested by Pedroni (1999). The key advantage of Pedroni cointegration test over other similar tests was that it controls for country size and heterogeneity allowing for multiple regressors (as in our case). Pedroni (1997) provided

---

1   Australia, Canada, Chile, Finland, France, Germany, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and USA.

seven panel cointegration statistics for seven tests. Four of those were based on the within-dimension tests while the other three were based on the between-dimension or group statistics approach. The critical values of panel cointegration test statistics are available in Table 1 in Pedroni (1999).

4.3.3. PMG regression

One shortcoming of Pedroni tests is that these tests do not estimate for the short-run relationship (Murthy, 2007) which also has significant policy relevance. A number of alternative methods are available that estimate both short-run and long-run association between variables. These methods also estimate the speed of short-run adjustment towards the long run equilibrium.

At one extreme, the fully heterogeneous-coefficient model imposes no cross-country parameter restrictions and can be estimated on a country by country basis. When both the time series and cross sections are large, the MG estimator (Pesaran and Shin, 1996) provides consistent estimates. At the other extreme, the fully homogeneous-coefficient model, the dynamic fixed effect model imposes the restrictions that all slope and intercept coefficients be equal across countries.

This study employs an intermediate approach between these extremes, the PMG estimator technique (Pesaran et al., 1999). The justification for employing this technique is based on the expectation that social capital (measured by trust) in OECD countries is likely to be affected by the long-run homogeneous conditions while the short-run conditions may be heterogeneous depending on various factors such as, country-specific characteristics like vulnerability to domestic and external shocks (for example, recent debt crisis in Greece and financial mismanagement, different types of adjustment to the recent global financial crisis), monetary and fiscal adjustment mechanisms. Financial-market imperfections, lack of sufficient time for implementation of different Internet and digital divide policies, change in political regime, etc.).

In order to comply with the requirements for standard estimation and inference, the regression equation (Equation 1) is embedded into an ARDL (p, q) model. In error correction form, this could be written as follows:

$$\Delta(y_i)_t = \sum_{j=1}^{p-1} \gamma_j^i \Delta(y_i)_{t-j} + \sum_{j=0}^{q-1} \delta_j^i \Delta(x_i)_{t-j} + \varphi^i[(y_i)_{t-1}$$
$$- \beta_1^i(X_i)_{t-1}] + \beta_0^i + \varepsilon_{it} \qquad (2)$$

Where, Y_i and X_i are the long run values of dependent (SC) and independent variables (NET and GDPCG) respectively. y_i and x_i represent short run values. γ_j^i and δ_j^i are short run coefficients, φ^i is the error correction adjustment speed, β_1^i are homogeneous long- run coefficients, β_0^i represents country-specific fixed effects and ε_{it} is the error term.

5. ESTIMATION RESULTS

Table 2 presents descriptive statistics of all the variables. It reveals that the data were fairly dispersed around the mean. The maximum number of Internet users per 100 people is above 96 while the minimum is 0.005. The mean of the Internet users per 100 people in the OECD panel is above 36% for the whole sample period. The percentage growth in the usage rate is very skewed throughout the region. Some countries experienced very high growth in Internet usage while others lagged behind. The mean GDP growth rate was close to 2% which implies that the OECD countries were somewhat successful in outweighing the negative effect of the global financial crisis that shook the world economy during 2008-2010.

Table 1 presents the correlation matrix that shows that the correlation coefficient between all the variables is <0.5 which rules out the threat of any multicollinearity problem in the data.

The unit root results are reported in Table 3. The results show that all the series are first-difference stationary [I(1)] indicating the presence of unit root. This implies the possibility of a cointegrating relationship among the variables.

Table 4 presents results from the Pedroni cointegration test. It is evident from Table 4 that the statistical values of three out of seven tests were greater than the critical values which indicate the rejection of the null hypothesis of no cointegration at least 5% level of significance. Based on these results, it can be concluded that there is a long run cointegrating relationship among the variables.

Table 5 presents results from the PMG estimations. The findings indicate that there is a highly significant negative relationship between Internet usage and social capital in the OECD countries in the long-run. No significant association between Internet use and social capital is observed. Surprisingly but not unexpectedly, the interaction term of Internet use and social capital has highly

Table 1: Correlation matrix

Variables	GDPCG	NET	SC
GDPCG	1.0000		
NET	0.2515	1.0000	
SC	0.0356	−0.0594	1.0000

Table 2: Descriptive statistics

Variable	Mean	SD	Min	Max
GDPCG	1.952032	2.484641	−8.97498	10.23
Net use (per 100 people)	31.31645	32.71986	0.00732	95
Social capital	0.379637	0.151378	0.0603	0.7417

SD: Standard deviation

Table 3: Panel unit root test

Variables	P	CD	Levels	First differences
			CIPS[2]	CIPS
GDP (per capita) growth rate	0.451	30.30***	−1.990	−2.962***
Net use (per 100 people)	0.969	67.05***	−1.944	−2.136**
Social capital	0.971	69.20***	2.610	−6.453**

**and ***denote the level of significance at 5% and 1% level of significance

2 CIPS runs the t-test for unit roots in heterogeneous panels with cross-section dependence, proposed by Pesaran (2007)

Table 4: Pedroni residual cointegration test

Alternative hypothesis: Common AR coefficients (within-dimension)				
Tests	**Weighted**			
	Statistic	**P**	**Statistic**	**P**
Panel v-statistic	3.232815	0.0006	3.163079	0.0008
Panel rho-statistic	1.086973	0.8615	1.109565	0.8664
Panel PP-statistic	2.090357	0.9817	2.103272	0.9823
Panel ADF-statistic	−5.623627	0.0000	−5.591478	0.0000
Alternative hypothesis: Individual AR coefficients (between-dimension)				
Tests	**Statistic**	**P**		
Group rho-statistic	3.240647	0.9994		
Group PP-statistic	4.131497	1.0000		
Group ADF-statistic	−5.731875	0.0000		

Null hypothesis: No cointegration. ADF: Augmented Dickey–Fuller

Table 5: Results from PMG estimation

Dependent variable: Social capital (trust)	**PMG**	
Variable	**Coefficient**	**Standard error**
Long-run coefficients		
NET	−0.000901***	0.0003781
GDPCG	0.0720542***	0.0183252
Error correction coefficient	−0.1042585***	0.0070742
Short-run coefficients		
Δ NET	0.0005369***	0.0002196
Δ GDPCG	0.0015184**	0.0003751
Intercept	0.0254775***	0.0029357

Note: *, ** and *** indicate level of significance at 10%, 5% and 1% respectively

significant positive relationship with economic growth in both the short- and the long-run.

The short-run relationship between both Internet use and social capital with economic growth are insignificant. The error correction term i.e., ECT_{t-1} is statistically highly significant with an expected negative sign. The value of ECT_{t-1} was −0.104 which implies that the short-run deviations are corrected by around 10% in each year towards the long-run equilibrium. It further suggests that a full convergence process will take approximately 10 years to reach the stable path of equilibrium.

6. SUMMARY AND CONCLUSIONS

This study addresses the research question "Does Internet generate social capital in OECD countries?" using panel data for 19 OECD countries for the period 1985-2012. The model also includes another variable, economic growth rate in order to offset omission bias. A cross sectional dependence test (CD) is performed followed by an appropriate unit root test (CIPS) that takes into account cross sectional dependence. The unit root test reported that all the variables are first-difference stationary. Pedroni cointegration tests confirm long-run relationship between variables. PMG regression technique is employed to estimate the effects of Internet use and economic growth rate on social capital measured by trust.

The findings suggest a highly significant negative long-run relationship between Internet usage and social capital and a significant positive relationship between them in the short-run. In other words, Internet use reduces social capital in the long-run but slightly enhances it in the short-run. Economic growth is found to stimulate social capital both in the short- and the long-run.

These findings have important policy implications. The negative long-run association between Internet use and social capital does not necessarily rule out the potential of including social capital issue into the digital divide policy of these countries as there is evidence of a short-run linkage between these variables. The fact that Internet use reduces social capital is attributed to the failure of building new trust and strengthening existing trust through network connectivity facilitated by the Internet. Such failure may be due to unfavorable trade-off between online and offline connectivity. Benefits from online connectivity might have been outweighed by the loss in offline connectivity due to online engagement. Face to face interactions and transactions still seem to be more effective to build trust and strengthen existing trust. At least, this may be potentially reflected through the findings in this study especially with respect to the negative long-run association between Internet use and social capital. Also lot of cyber crimes take place through the Internet which may have negative influence on the moral and social values of a society especially in the long-run. This may also play a role to slacken the string of trust among people.

The finding of the positive significant effect of economic growth on social capital also sounds sensible and is in line with expectations. If and when an economy experiences high growth rates, it triggers the market to be more vibrant and robust. As a consequence, more investment pour into the market and it generates increasing number of transactions between businesses and between citizens of a country. Such growing numbers of transactions are likely to boost trust (social capital) among people.

Despite maximum possible efforts, this study suffers from certain limitations. First of all, a large number of OECD countries were dropped from this work due to the missing of significant amount of social capital data. Another issue is that the digital divide policies of different countries of this region differ although they are priority policies of almost all of these countries, one should not expect same policy implications of the findings of such research to each and every country of the region. Nevertheless, the heterogeneity in the structure and characteristics of the economies within the region (for example, if a comparison is made between the economy of France with that of Chile) limits the implications of such studies. It should also be noted that the estimation results are not expected to be invariant across different econometric specifications. Country specific studies and studies involving different regions within a country might perhaps be able to provide more reliable and better policy-oriented findings, since, the issue this study deals with looks more aligned to rural and regional areas within a country. Further such academic explorations are left for future.

7. ACKNOWLEDGMENT

REFERENCES

Antoci A., Sabatini, F., Sodini, M. (2012), See you on Facebook, A framework for analyzing the role of computer-mediated interaction in the evolution of social capital. The Journal of Socio-Economics, 41, 541-547.

Barney, D. (2004), The Network Society. Cambridge: Polity Press.

Bauernschuster, S., Falck, O., Woessmann, L. (2014), Surfing alone? The internet and social capital: Evidence from an unforeseeable technological mistake, Journal of Public Economics, 117, 73-89.

Bourdieu, P. (1980), The production of belief: Contribution to an economy of symbolic goods', Media. Culture and Society, 2, 261-293.

Bourdieu, P. (1986), The forms of capital. In: Richardson, J.G., editors. Handbook of Theory and Research for the Sociology of Education. Westport, CT: Greenwood Press. p242-258.

Cardona, M., Kretschmer, T., Strobel, T. (2013), ICT and productivity: Conclusions from the empirical literature. Information Economics and Policy, 25, 109-123.

Castells, M. (2000), The Rise of the Network Society. 2nd ed. Oxford: Blackwell Publishers.

Charlson, D. (2013), Bridging the digital divide: Enhancing empowerment and social capital. Journal of Social Inclusion, 3(2), 6-19.

Coleman, J.S. (1988), Social capital in the creation of human-capital. American Journal of Sociology, 94, S95-S120.

Coleman, J.S. (1990), Foundations of Social Theory. Cambridge, MA: Harvard University Press.

DiMaggio, P., Hargittai, E. (2001), 'Digital Divide to Digital Inequality: Studying Internet Use as Penetration Increases', Working Paper No. 15, Center for Arts and Cultural Policy Studies. NJ: Princeton University.

Fernback, J. (2005), Information technology, networks and community voices: Social inclusion for urban regeneration. Information Communication & Society, 8, 482-502.

Ferreira-Lopes, A., Roseta-Palma, C., Sequeira, T.N. (2012), When sociable workers pay off: Can firms internalize social capital externalities? Structural Change and Economic Dynamics, 23(2), 127-136.

Foth, M., Podkalicka, A. (2007), Communication policies for urban village connections: Beyond access? In: Papandrea, F., Armstrong, M., editors. Proceedings Communications Policy & Research Forum (CPRF), Sydney. p356-369.

Fukuyama, F. (1995a), Trust: The Social Virtues and the Creation of Prosperity. New York: The Free Press.

Fukuyama, F. (1995b), Social capital and the global economy. Foreign Affairs, 74, 89-103.

Gleaser, E., Liabson, D.I., Scheinkman, J.A., Soutter, C.L. (2000), Measuring trust. Quarterly Journal of Economics, 115, 811-846.

Hopkins, L. (2005), Making a community network sustainable: The future of the wired high rise. The Information Society, 25(5), 379-384.

Knack, S., Keefer, P. (1997), Does social capital have an economic payoff? A cross country investigation. Quarterly Journal of Economics, 112(4), 1251-1288.

Kyujin, S. (2013), After broadband ınfrastructure saturation: The ımpact of public ınvestment on rural social capital. International Journal of Communication, 7, 26-47.

Lippert, S., Spagnolo, G. (2011), Networks of relations and word-of-mouth communications. Games and Economic Behavior, 72, 202-217.

Meredyth, D., Ewing, S., Thomas, J. (2004), Neighbourhood renewal and government by community. International Journal of Cultural Policy, 10, 85-101.

Murthy, N.R.V. (2007), Panel cointegration analysis: An empirical example in cointegration for the applied economist. İn: Rao, B., editor. Cointegration for the Applied Economics. 2nd ed. New York: Palgrave Macmillan. p222-256.

Ng, A., Ibrahim, M.H., Mirakhor, A. (2014), Does trust contribute to stock market development? Economic Modelling, 52, 239-250. Doi:10.1016/j.econmod.2014.10.056.

Notley, T.M., Foth, M. (2008), Extending Australia's digital divide policy: An examination of the value of social inclusion and social capital policy frameworks. Australian Social Policy, 7, 1-23.

OECD. (2013), Economic Outlook 2013. Paris: OECD.

OECD. (2001), OECD Communications Outlook. Paris: OECD.

Pedroni, P. (1997), Panel Cointegration; Asymptotic and Finite Sample Properties of Pooled Time Series Tests, with an Application to the PPP Hypothesis: New Results, Working Paper, Indiana University, April.

Pedroni, P. (1999), Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and Statistics, 61, 653-670.

Pesaran, M.H., Shin, Y. (1996), Cointegration and speed of convergence to equilibrium. Journal of Econometrics, 17, 117-143.

Pesaran, M.H., Shin, Y., Smith, R. (1999), Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association, 94, 621-634.

Pesaran, M.H. (2004), General diagnostic tests for cross section dependence in panels. Cambridge Working Papers in Economics No. 435. University of Cambridge and CESifo Working Paper Series No. 1229.

Pesaran, M.H. (2007), A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics, 22, 265-312.

Putnam, R.D. (2000), Bowling Alone: The Collapse and Revival of American Community. New York, NY: Simon and Schuster.

Putnam, R. (1995), Bowling alone: America's declining social capital. Journal of Democracy, 6, 65-78.

Putnam, R.D. (1993), Making Democracy Work: Civic Traditions in Modern Italy. Princeton, USA: Princeton University Press. p433.

Righi, A. (2013), Measuring social capital: Official statistics initiatives in Italy. Procedia-Social and Behavioral Sciences, 72, 4-22.

Selwyn, N., Facer, K. (2007), 'Beyond the Digital Divide: Rethinking Digital Inclusion for the 21st Century. Bristol, UK: Future Lab.

Servon, L.J. (2002), Bridging the Digital Divide: Technology, Community and Public Policy. Malden, MA: Blackwell.

Simpson, L. (2005), Communication ınformatics and sustainability, Why social capital matters? The Journal of Communication Informatics, 1(2), 102-119.

Vicente, M. and Lopez, A. (2011), Assessing the regional digital divide across the European union. Telecommunication Policy, 35, 220-237.

Wellman, B. (2001), Physical place and cyber place: The rise of personalized networking. International Journal of Urban and Regional Research, 25(2), 227–252.

Westlund, H., Adam, F. (2010), Social capital and economic performance: A meta analysis of 65 studies. European Planning Studies, 18(6), 893-919.

World Bank. (2005), Community Driven Development and Social

Capital: Describing a Base-line Survey in the Philippines, Social Development Department. Washington, DC: The World Bank.

World Bank. (2014), The World Development Indicators Database (WDI). Washington, DC: The World Bank.

World Values Survey (WVS). (2014), The World Values Survey, *1981-2014*. The World Values Survey Association. Available from: http://www.worldvaluessurvey.org. [Last accessed on 2015 Sep 15].

Zak, P.J., Knack, S. (2001), Trust and growth. Economic Journal, 111, 295-321.

Zhang, T. (2013), Income disparity and digital divide: The ınternet consumption model and cross-country empirical research. Telecommunications Policy, 37, 515-529.