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Does the Internet make people happier?

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Abstract

As people are spending more time online, it is important to evaluate the impact of Internet use on individual well-being. Internet use yields direct utility and economic returns (e.g. better job, higher productivity) that may increase life satisfaction. But the Internet might also have detrimental effects (addiction, social isolation, e.g.). This paper empirically examines the relation between Internet use and subjective well-being. Using Luxemburgish data from a European social survey, we find evidence that non users are less satisfied in their life than Internet users. This result holds when we control for socio-demographic characteristics, social capital, values and beliefs, and health and income. Moreover, the positive influence of Internet use is stronger for low income and young individuals. These findings suggest that public policy aiming to reduce the digital divide are socially desirable..

Keywords: Internet, happiness, well-being, digital divide, social capital, social values.

JEL classification codes: A12; D12; D6, H4, L86, Z13

1   Introduction

Given the increasingly prominent role the Internet plays in people's daily life, understanding its influence on individual well-being is crucial. But, this question has received limited attention from scholars. This paper aims to fill this gap by examining whether Internet use increases or decreases life satisfaction.

Several arguments are in favor of a positive influence of the Internet. First, the Internet gives access to a wide range of applications and services that provide direct or indirect benefits (Hong, 2007). Many online services are related to entertainment or leisure activities (music, video games …) that are a source of enjoyment. Thanks to the Internet, people can also save time or money: they can get better deals, they can search and process information more efficiently, etc. By relaxing their budget or time constraints, the Internet should allow individuals to reach higher level of utility that directly participates in increasing well-being. Goolsbee and Klenow (2006) estimated the yearly value per consumer derived from Internet access to $3,000.

Another reason to support the positive effect of Internet use on happiness is the fact that many Internet applications (social networking, emailing, blogging, etc.) have the characteristics of a relational good (i.e. a good that is enjoyed only when it is shared with friends or family members, Uhlaner (1989)). As happiness increases with the consumption of relational goods (Bruni and Stanca, 2008; Gui and Stanca, 2010), Internet use could have a positive effect on happiness if it rises the time dedicated to relational activities. In the same vein, the Internet is a means of building and maintaining social relations or social capital (Franzen, 2003; Penard and Poussing, 2010; Shklovski, Kiesler and Kraut, 2006)). Individuals can complement their face-to-face interactions with their family and friends thanks to emailing, instant messaging, or with social networking sites. They can also interact online with people they have never met physically and make new "virtual friends". But most of the time, there is a relational continuum between online and offline social interactions (Ellison et al., 2007). By improving and expanding social capital, online activities can indirectly generate more well-being as social capital is known as a main influential factor of happiness (Helliwell, 2003). However, Lee et al. (2011) find that Internet communication has no significant effect on the perceived quality of life contrary to face-to-

face communication (with friends and family members). They conclude that computer-based communication cannot replace traditional sociability.

Another reason to presume a positive relation between Internet use and happiness is that nowadays having access to the Internet is perceived as a norm in developed countries. Non Internet users could feel ostracized or socially excluded even if they do not feel the desire to adopt the Internet.

However, Internet use might also have detrimental effects. Kraut et al. (2002) find that Internet use increases social interactions with friends and kin only for people rich in social capital. For people who have few friends, Internet use tends to strengthen social isolation. The time spent online can reduce the time available for face-to-face interaction (Nie, Hillygus and Erbring, 2002) and have the same negative impact on happiness as watching TV (Frey, Benesch and Stutzer, 2007). The Internet might also create addictive behavior (gambling, online gaming, pornography, e.g.) and be detrimental to mental health (Li and Chung, 2006).

Few studies have investigated the impact of the Internet on happiness. Kavetsos and Koutroumpis (2010) analyze the impact of information technology on subjective well-being, using a pooled cross-sectional data set of European countries. They find that having a cell phone or an Internet connection at home is associated with higher levels of well-being. Living in a country with a high rate of mobile and Internet users improves life satisfaction as well. Using a survey of 7 000 retired persons, Ford and Ford (2009) show that Internet use by elderly Americans leads to about a 20% reduction in depression; in other words, the Internet increases their mental well-being.[1] However, these two studies have serious limitations. Ford and Ford (2009) consider a very specific population (retired people), whereas Kavetsos and Koutroumpis (2010) investigate the relation between households' Internet adoption and individual happiness without measuring the intensity of Internet use. The estimated effect can be biased by the fact that some individuals can have Internet access at home without using it whereas other can use the Internet without being connected at home.

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[1] See also the report published by BCS (The Chartered Institute for IT by Trajectory Partnership) and entitled "The Information Dividend: Why IT makes you 'happier'". This study shows that Internet use has a positive impact on happiness. Moreover, people with lower incomes or with fewer educational qualifications and women appear to benefit more from access to the Internet. This finding is based on the Word Value Surveys (35 000 respondents living in developed and developing countries).

The objective of this article is to empirically examine how Internet use affects life satisfaction. The originality is to combine country-level data and individual-level data (using the Luxemburgish data of the European Value Survey) to provide complementary evidence on the relation between Internet use and subjective well-being. Cross-country comparisons show that Internet penetration rate is positively correlated with the declared level of happiness even when we control for the level of income and health. However, the relation is no more significant when the level of trust is introduced. To go further, we investigate the effect of Internet use on life satisfaction at the individual level using Luxemburgish data from the European Social Survey. We find evidence that non users are less satisfied in their life than Internet users. This result holds when we control for socio-demographic characteristics, social capital, values and beliefs, health and income. However, our findings are weakened by potential endogeneity issues.

Our research has theoretical and policy implications. First, our paper is related to the literature on happiness. This literature aims to explain why some countries are happier than other countries or what make people more satisfied with life. Research on happiness has made progress in identifying the determinants of happiness (Blanchflower and Oswald, 2004; Dolan Peasgood and Whife, 2008; Helliwell, 2006; Ferrer-i Carbonell and Frijters, 2004; Frey and Stutzer, 2002, 2010; Oswald, 1997). The main predictors of happiness are health, employment status, marital status, social capital, income and education. In other words, poor health, separation, unemployment and lack of social contact are strongly associated with low well-being. This paper suggests that the Internet has now become a key driver of well-being.

Our paper is also related to the literature on the digital divide (Di Maggio et alii, 2004; Goldfarb and Prince, 2008; Prieger and Hu, 2008; Drouard, 2011). Our research question is critical because if the time spent online is a source of happiness, then Internet users could increase their subjective well-being compared to Internet non-users. As high income individuals tend to be happier than low income people, then the digital divide may increase existing inequalities. Promoting or generalizing Internet usage in all population groups could be an effective policy to reduce social and economic inequalities and equalize well-being.

The remainder of the paper is as follows. The next section presents cross-country comparisons of the relation between happiness and Internet penetration using a sample of European countries. Section 3 reviews the literature on the determinants of happiness and lays out the empirical strategy. Section 4 describes data and the methodology. Section 5 presents the estimation results. The last section concludes

2 Happiness and Internet use: Cross-country evidence

The diffusion of the Internet is widespread in developed countries, even if some disparities still exist. Figure 1 displays Internet penetration rates among European Countries: North-European countries form the leading group while Eastern and South-European countries are lagging (source Eurostat, 2008). Do we observe similar differences in the level of happiness between European countries? To know whether countries with the highest Internet diffusion are also the happiest, we use data from the European Social survey[2], and more specifically the following question: *"Taking all things together, how happy would you say you are?"*. Individuals have to answer on a scale from 0 (extremely unhappy) to 10 (extremely happy). Figure 2 displays the average level of happiness in different European countries in 2008.
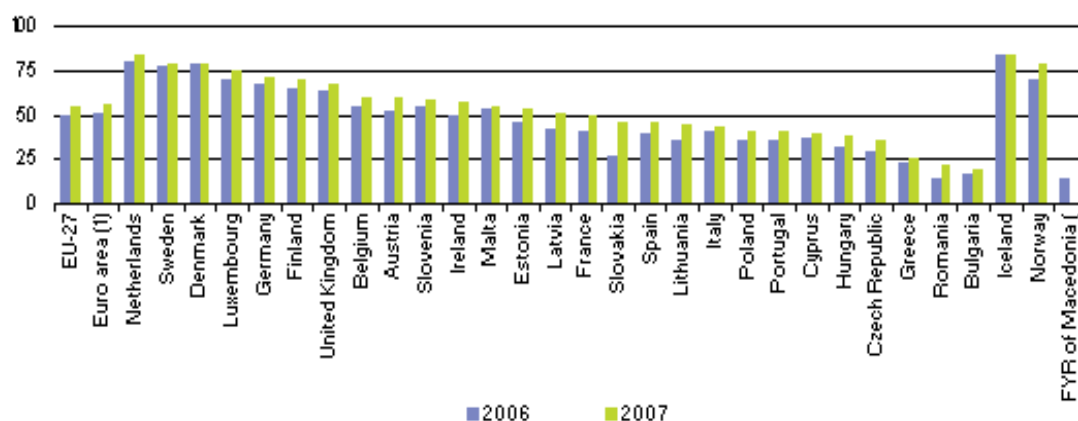
(1) EA-12 in 2006; EA-13 in 2007.
(2) Not available for 2007.
Source: Eurostat (tsiir040)

Figure 1 – Households Internet access (Eurostat, 2008)

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[2] This survey is regularly conducted in 45 European countries (with a periodicity of two years). In each country, about 1200–2800 people are interviewed.
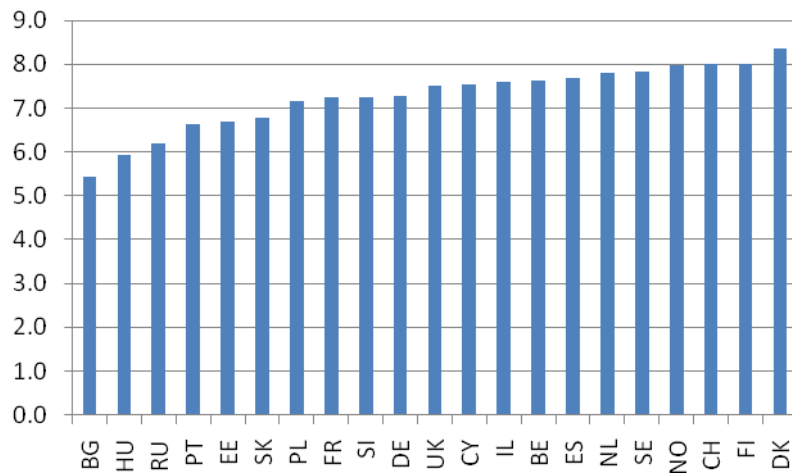
**Figure 2 - Average level of happiness in European countries
(Data from European Social Survey, 2008, except Israel: national Data, 2008)[3]**

Northern European countries (Denmark, Finland, Norway and Sweden) stay ahead with the highest declared levels of happiness, while Eastern European countries (Bulgaria, Hungaria and Russia) bring up the rear. Figure 3 plots the level of happiness and the penetration rate of internet of users[4] for this sample of European countries. This shows a clear positive relation with a correlation coefficient equal to 0.45. The more advanced countries in Internet adoption are also characterized by a higher level of happiness. This is particularly obvious for the Northern countries (Denmark, Finland, Norway, the Netherlands, and Sweden). Even if correlation does not mean causality, these preliminary results encourage us to go further and uncover the effects behind this relation.

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[3] Note: BG=Bulgaria, HU=Hungary, RU=Russia, PT=Portugal, EE=Estonia, SK=Slovakia PL=Poland, FR=France, SI=Slovenia, CY=Cyprus, BE=Belgium, IL=Israel, ES=Spain, NL=The Netherlands, NO=Norway, CH=Switzerland, FI=Finland, DK=Deustchland, SE=Sweden.

4 The penetration rate of Internet users comes from Euromonitor International Database, 2008.
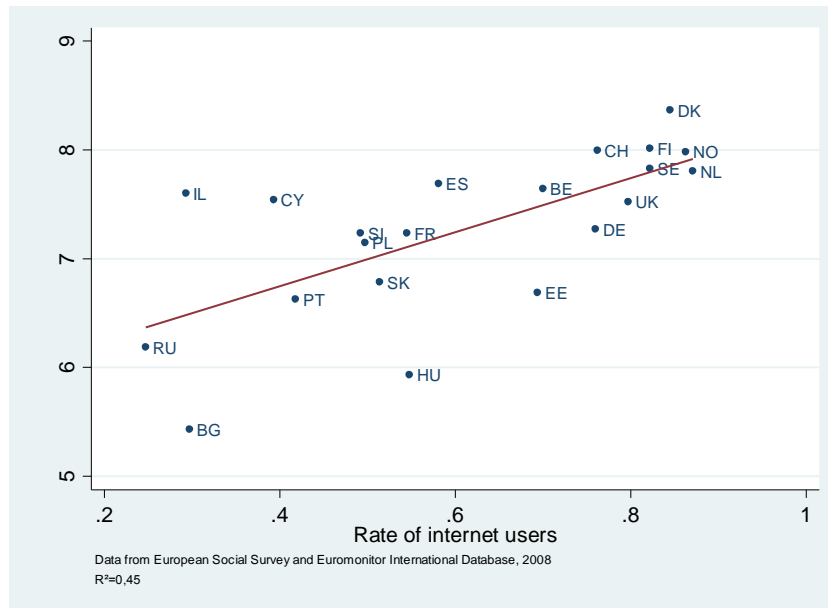
Figure 3 - Relationship between the level of happiness and the penetration rate of Internet users among the European countries

Turning back to the literature on happiness, several reasons can be put forward to explain the positive correlation between Internet diffusion and well-being. First, information technologies can generate productivity gains. Even if the magnitude of these gains has been largely debated (Gordon, 2003; Onliner and Sichel, 2000), there is no doubt that for any country, a higher diffusion of IT contributes to economic growth and indirectly makes people happier as the average income per capita increases. However, the relation between IT and happiness could be spurious because a richer country is characterized by better living conditions, leading to a higher level of subjective well-being. Meantime, a richer country tends to invest more in digital infrastructure and provides widespread broadband access to its citizens who are subsequently encouraged to use the Internet more.

Besides, the Easterlin paradox suggests that the relation between income and well-being is not clear-cut. Easterlin (1995) underlines that the level of life satisfaction has remained quite stable in most developed countries for the last three decades whereas GDP per capita has tremendously increased[5]. Empirical studies show that

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[5] The Easterlin paradox can be explained by the notion of relative income. People take care of their relative income rather than their absolute income (Clark and Oswald, 1996; Easterlin, 2001; Kingdon and Knight, 2007). They tend to be happier if their income has increased proportionally more than the income of their reference group or their close neighbors. For instance if their income increases by 10%, and all people in the neighborhood experience the same increase, they will not feel happier.

average income per capita is only a significant determinant of happiness when comparing developed countries and developing countries (Stevenson and Wolfers, 2008). But, among developed countries, the main determinants of happiness are not economic factors like growth rate, unemployment or inflation, but rather social factors and especially the level of social capital[6] (Bornskov, 2003; Helliwell, 2003; Dolan et al., 2008; Bruni and Stanca, 2008, Sarracino, 2010). For instance, Bjornskov (2003) finds that trust and civic participation (standard measures of social capital) are powerful factors in explaining why some countries are happier than others. The role of social capital is dual: in low-income countries, its role is mainly instrumental by reducing transaction costs and enabling more economic stability, whereas in high-income countries, social capital plays a utilitarian role by providing more social cohesion (Knack and Keefer, 1997). In the same vein, Helliwell and Putnam (2004) find that country-level social capital and trust increase life satisfaction and reduce the level of suicide. As the Internet is now a widespread means to building and maintaining social capital, Internet use could also have an indirect effect on happiness through social capital.

Figure 4 displays the relationship between the penetration rate of Internet users and the level of trust for our sample of European countries. We obtain a positive relation with a correlation coefficient of 0.67. Without presuming any causal relation, it can be argued that a higher level of social trust in a country facilitates Internet usage like online commerce and social networking sites, as people should feel less afraid of interacting with merchants or other persons by the means of the Internet, even if they have never personally met them (Ba and Pavlou, 2002).

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[6] Social capital refers to the individual's collection of social ties that provide access to resources, information or assistance and from which one can derive market and non-market benefits (better social status, better educational and professional achievement, more happiness, etc.) (Glaeser et alii, 2002 ; Pénard and Poussing, 2010). At a community or country level, social capital refers to the degree of trust and informal values or norms shared among citizens or community members that permit them to cooperate easily with one another (Putnam, 2000).
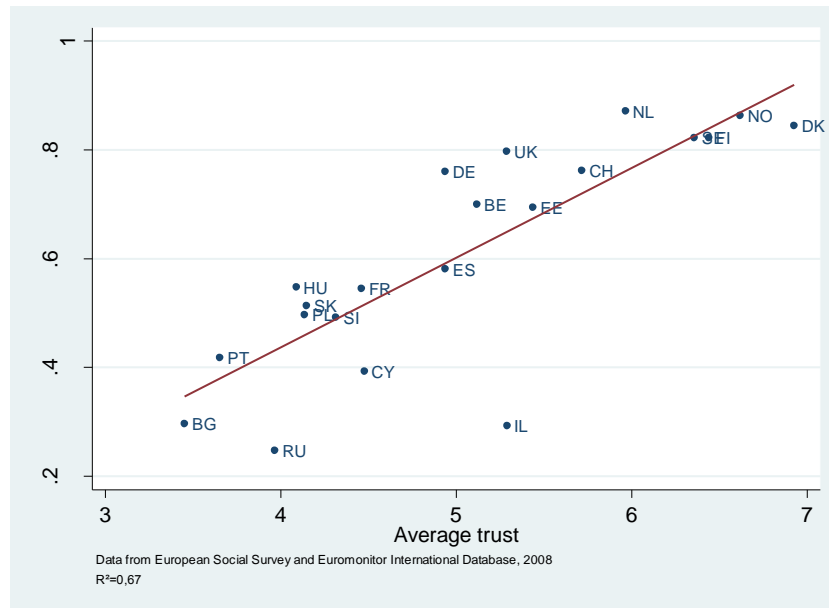
Figure 4 – Relationship between average trust and the rate of internet users and among European countries

To better evaluate the relationship between Internet diffusion and happiness, we ran several linear regressions using four waves of the European Social Survey (ESS) (2002/2003, 2004/2005, 2006/2007, 2008/2009).[7] In a first step, we only introduce the rate of Internet users as an explanatory variable of Happiness. Then, we add the logarithm of GDP per capita[8] (to control for the income effect). Then, we introduce a measure of healthiness that usually is a strong determinant of happiness (Dolan, Peasgood and White, 2008), and finally we add the level of trust in others.

Regressions are estimated using robust standard errors to correct for non-normality of the residuals. Table 1 shows a significant positive relation between the rate of Internet users and happiness. This relation persists even after controlling for income and health. However Internet penetration no longer has a significant effect on happiness when the level of trust is added. This suggests that the impact of Internet diffusion on happiness has a lot of similarities with the impact of trust. It seems to indicate that the Internet has no direct effect on country's well-being but is probably influential through the channel of social capital by modifying the nature and intensity

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[7] ESS Round 1-4: European Social Survey Round 4 Data (2008). Data file edition 2.9. European Social Survey Round 3 Data (2006). Data file edition 3.9. European Social Survey Round 2 Data (2004). Data file edition 3.1. European Social Survey Round 1 Data (2002). Data file edition 6.1. Norwegian Social Science Data Services, Norway – Data Archive and distributor of ESS data.
8 Data on GDP per capita come from the World Bank (estimated in US $ constant 2005).

of social ties. However, these conclusions have to be considered very cautiously because they are based on aggregate country-level measures of social trust and Internet diffusion. Besides, the measure of Internet use is very rough and does not distinguish between heavy and light Internet users, an issue which could weaken the robustness of our estimations.

<div align="center">INSERT TABLE 1</div>

In the remaining sections of the paper, we investigate the relation between social capital, Internet use, and happiness at an individual level to better disentangle the direct and indirect effects of Internet use. This approach allows us to take into account the intensity of Internet use and to control for more factors, as well as checking for endogeneity problems.

3 Data and methodology

3.1 Description of the data

We use the Luxemburgish part of the "European Value Survey" (EVS) to examine the relationship between happiness and Internet use. The EVS aims to provide insights into the ideas, beliefs, preferences, attitudes, values, and opinions of European citizens. We were allowed to add some questions about Internet use (intensity of Internet use, motives and individual benefits of the Internet) to the Luxemburgish survey. Unfortunately, it was not possible to replicate these questions in the EVS of other European countries. Nonetheless, the focus on Luxemburg is interesting for our research question because Luxemburg is a small European country with a highly heterogeneous population in terms of values, culture and social capital: 40 % of the population are immigrants (see Sarracino (2011) for a detailed analysis of the relationship between social capital and well-being in Luxemburg).

The Luxemburgish EVS was conducted in face-to-face interviews from June to December, 2008.[9] The eligible respondents were individuals who reside in Luxem-

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[9] Multiple languages were used to conduct the survey interviews: Luxemburgish, French, German, Portuguese, English. The 120 interviewers received specific training for this survey. The duration of interviews was between 2 and 3 hours.

burg and are at least 18-years-old. A stratified sample was extracted from the registration file of Social Security. 1,610 valid interviews were obtained, but only 1,332 questionnaires were complete for the purpose of our study.[10] Table 2 presents the summary statistics for the variables used in our econometric analyses. The mean age of our respondents is 42.7 (the minimum age is 19 and the maximum age is 89) and the sample is equally distributed between male and female. Most of them (64.0%) are married or live with a partner. 33.9% of the respondents have a pre-high school level, 36.2% a High school level, 14.3% a Bachelor degree and 15.6% more than a bachelor degree. 54.1% have a full time salaried job (at least 30 hours a week) or are self-employed.

<div align="center">INSERT TABLE 2</div>

Regarding the Internet part of the survey, 77.5% have used the Internet over the last three months (in 2008). 75.9% have been using the Internet for more than 4 years. On average, 37.9% of the respondents are online several times per day, 22.2% once a day and 17.1% at least once a month (but not every day)[11].

Now, we present the dependent and independent variables used in our econometric study.

3.2   Dependent variables

The European Value Survey provides two measures of subjective well-being. First, EVS asks individuals whether in general they feel satisfied with their life or not. They have to answer from 1 (very dissatisfied) to 10 (very satisfied). Figure 5 shows that the distribution of the responses is highly concentrated in the top of the scale (values of 8, 9 and 10) with an average value of 7.8. It indicates that Luxemburgish people feel rather satisfied with their life.

EVS also asks individuals how happy they are (not at all happy, not very happy, quite happy, very happy). 37.5% of the individuals feel very happy, 57% quite happy and only 5.5% are not very happy or not at all happy.

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[10] To improve the representativeness of the 1610 respondents, a sample-balancing step was performed. The weighting procedure uses additional information about gender, age and professional status in the Luxemburgish population.
[11] 56% of the Internet users have purchased or ordered goods and services over the last three months. 54.9% of them used an instant message system, and 50.5% used social networking services.

As the distribution of answers for life satisfaction is strongly skewed, we re-code this variable to have meaningful ordinal values. We created a variable denoted "Life satisfaction" that is equal to 1 when the original satisfaction is between 1 and 6, to 2 when individuals choose 7 or 8 and to 3 for a life satisfaction of 9 or 10. We use the three-level life satisfaction as our main dependent variable. The variable "HAPPINESS" takes also three values: 1 when the individuals are not very happy or not at all happy, 2 when they are quite happy, and 3 when they are very happy.
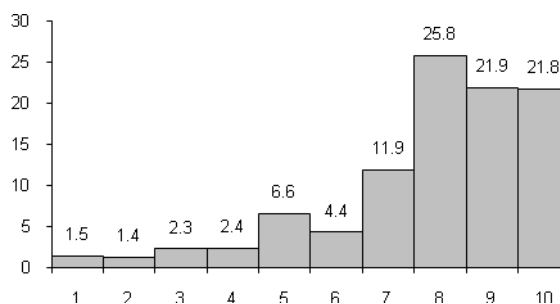
Figure 5: Distribution of life satisfaction (EVS Luxembourg, 2008)

3.3   Independent variables

Our variable of interest is the intensity of Internet use measured by four dummies: *Onlineday+* if the individual uses the Internet several times per day (37.9%), *OnlineDay* if the individual uses the Internet only once per day (22.2%), *OnlineMonth* if the individual is seldom connected (17.1%), and *NoInternet* if the individual never uses the Internet (22.5%).

We also introduce socio-demographic variables: gender, age (and age squared to control for non-linear effects of age on subjective well-being), marital status (living with a partner), education (primary, secondary, tertiary level) and occupational status (a full-time job[12]).

Previous works have found a U-shaped curve between well-being and age: happiness tends to decrease until it reaches a minimum level around 40 years, and then increases with age (Blanchflower and Oslwald, 2004). Regarding gender, wom-

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[12] It can be a salaried job or a self-employed job.

en seem to report higher happiness, but this result is not very robust (Alesina et al 2004). Being single (especially recently separated or divorced) should decrease happiness (Helliwell, 2003). Having a full time job should increase life satisfaction as many studies found that unemployment is negatively correlated with well-being (Frey and Stutzer, 2002, Helliwell, 2003, Clark and Oswald, 1994). Finally, the effect of education is not clear and not significant in most empirical studies when controlling for health and income (Blanchflower et al. 2004).

A second set of variables concerns sociability. We first create a *Membership score* to measure the participation in voluntary organizations. We add one unit to the membership score when the individual belongs to at least one association in each of the following categories (*i) Trade unions, ii) Sporting clubs, iii) Youth clubs iv) Religious or church organisations, v) Associations for educational or cultural activities, vi) Political parties or groups, vii) Associations for local community actions (job, housing, etc.), viii) Charities ix) Association for Third world development or human rights, x) Association for Conservation, ecology or animal rights, xi) Association for women rights xii) Professional associations, xiii) Peace movement, xiv) Organisations concerned with health, xv) Association for foreigners*). A similar method is used to calculate a *Volunteer score*, based on the number of organization in which the individual volunteers. On average, each individual belongs to 2.3 voluntary organizations and volunteers in 1.6 associations.

We also calculate a sociability score based on the intensity of social interaction (or communication) with friends, workmates (out of office hours), members of the same church, and people belonging to the same associations[13]. The score of sociability is equal to 5.4 on average.

Based on previous studies, we can expect a positive relationship between well-being and community involvement (membership or volunteering) (Pichler 2006, Helliwell 2003). Sociability (i.e. contacts with family and friends) should also be positively correlated with happiness (Becchetti, Pelloni and Rossetti, 2008).

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[13] The sociability score is calculated by adding 3 points if the individual has meeting with his/her friends every week, 2 points if these meetings are only once or two times a month and 1 point if it is only few times per year (and zero otherwise). We do the same thing for the three other social groups. Hence, the highest possible value for the sociability score is 12.

A third set of variables concerns values and attitudes. We control for trust in the other and in the institutions. Trust in the other is based on the following question: "do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?" People must choose on a 10-point scale from 1 (Most people would try to take advantage of me) to 10 (Most people would try to be fair). Trust in the institution is a score that measures the confidence in 8 institutions: press, trade unions, police, parliament, government, justice, political parties and public or civil services. For each institution, the score takes the value 0 if the individual has no or little confidence, 1 for a certain level of confidence and 2 for a strong confidence. The score reaches its maximum at 16, but on average is equal to 5.6.

We introduce a binary variable that equals 1 if the individual believes in god. We also take into account the feeling of freedom and control. People were asked how much freedom of choice and control they have over the way their life turns out (on a 10 point scale with 1 for no control to 10 for a great deal of control). This variable allows us to distinguish people who attribute the outcome of their actions to internal factors such as skills and efforts and those who tend to attribute it to external factors like fate and destiny. We have also a measure of ideological preferences on income distribution. People were asked whether they agree that incomes should be more equal or there should be greater incentives for individual effort (a scale from 1 to 10).

We expect belief in God and church attendance to have a positive effect on life satisfaction (Helliwell 2003). Stronger religious beliefs may give people more confidence in their future and act as a buffer against stress and life accident (Clark and Lelkes, 2005). Moreover, social trust has substantial positive effects on well-being and is associated with a lower probability of suicide (Helliwell and Putnam, 2004, Bjornskov, 2007). Political perceptions can also matter for happiness. Conservatives tend to be happier than liberals because the latter are very sensitive to inequality. They feel unsatisfied or frustrated by the existing social and political system and would prefer less income disparity whereas conservatives are satisfied with status quo (Napier and Jost, 2008). Finally, people who believe that they have a greater control or freedom over their choices tend to be happier (Verme, 2009).

Finally, we have a subjective measure for health and income satisfaction with a seven point scale (1 for very unsatisfied to 7 for very satisfied). The majority of the

population declares a high level of health and income satisfaction (62.8% have cho-sen the level 6 and 48.3% the level 7). Obviously, income and health satisfaction should increase the overall life satisfaction as they are among the main factors influencing well-being. Many studies consistently show a strong relationship between life satisfaction and both physical and psychological (or mental) health.

3.4 Econometric model

We estimate the determinants of life satisfaction and happiness with ordered logit models. In an ordered logit model, there is an observed ordinal variable, Y (here, the declared level of life satisfaction or happiness that can take three values 1, 2 or 3). Y is a function of another unmeasured variable, Y^*. The value of this continuous latent variable Y^* determines what the observed ordinal variable Y equals depending on two thresholds (or cut-off terms) c_1 and c_2.

$$\begin{cases} Y_i = 1 & if \quad Y_i^* \leq c_1 \\ Y_i = 2 & if \quad c_1 < Y_i^* \leq c_2 \\ Y_i = 3 & if \quad Y_i^* > c_2 \end{cases}$$

with $Y_i^* = \sum_{j=1}^{J} X_{ji} \beta_j + \varepsilon_i$ where X_j is the explanatory variables and ε_i is the random error term. Based on the cut-off terms, we can determine the probability that Y will take on a particular value:

$$\Pr(Y = 1) = \frac{1}{1 + \exp(c_1 - \sum_{j=1}^{J} X_{ji} \beta_j)}$$

$$\Pr(Y = 2) = \frac{1}{1 + \exp(c_2 - \sum_{j=1}^{J} X_{ji} \beta_j)} - \frac{1}{1 + \exp(c_1 - \sum_{j=1}^{J} X_{ji} \beta_j)}$$

$$\Pr(Y = 3) = 1 - \frac{1}{1 + \exp(c_2 - \sum_{j=1}^{J} X_{ji} \beta_j)}$$

Given F the cumulative (logistic) distribution function, the loglikelihood function is given by:

$$\ln L(\beta, c | Y, X) = \sum_{i=1}^{N} \sum_{s=1}^{3} \ln \left[F(c_s - X\beta) - F(c_{s-1} - X\beta) \right]$$

The maximum likelihood method is used to estimate the model. In the next section, we present and comment the econometric results.

4 Results and robustness checks

4.1 Results

First, we discuss the results for the model of Life Satisfaction with a three-level scale (Table 2).[14] When we only introduce the intensity of Internet use and control for the socio-demographic characteristics, we find that the non-use of the Internet has a significant negative impact on life satisfaction. However, among the Internet users, there is no significant difference between the heavy and light users. This suggests that being deprived of Internet access (i.e. being on the wrong side of the digital divide) has a detrimental effect on the well-being. As expected, living with a partner and having a full time job increases life satisfaction. Life satisfaction also decreases with age, but at a decreasing rate. Finally, education and gender have no effect.

INSERT TABLE 3

In column 2, we introduce the variables related to social capital (sociability and community involvement). Belonging to voluntary organizations and volunteering have no impact on well-being. But, having frequent contacts with friends or acquaintances increases life satisfaction. In column 3, we add the set of explanatory variables related to individual values and beliefs. People who trust the other or the institutions more, and thus have more control on their life, feel more satisfied. These findings are consistent with previous studies (Verme, 2009, Helliwell, 2003). Moreover, individuals who have strong preferences for equal income are less likely to be satisfied with their life. This is in line with Napier and Jost (2008), who found that liberals, who are sensitive to poverty and social inequality, tend to be less happy than conservatives. Finally, belief in god does not affect life satisfaction.

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[14] In the appendix, Table 7 presents the estimation for Life satisfaction on a 10-point scale. Results are quite similar to those displayed in Table 3.

Column 4 introduces two additional factors that are strong predictors of well-being in previous studies: health and income. They have the expected positive sign and are highly significant. Individuals who declare to be healthy and have comfortable income are also very satisfied with their life. When we control for income and health, it reduces the negative impact of no Internet use on life satisfaction. However, this decrease does not nullify the impact, which still remains significant. This confirms our intuition that the digital divide affects life satisfaction. Interestingly, the level of education becomes significant when we take into account the level of income. People with the highest degree of education (Master/phD) tend to declare lower global satisfaction for the same level of income and health.

It is often argued that Internet use could have differentiated benefits depending on age, gender or other features. To test this idea, we introduce interaction variables between Internet use and the following variables (age, partner, gender, sociability and income). First, we find a negative estimated coefficient for ONLINE*AGE, meaning that the positive impact of Internet use on life satisfaction is higher for youngest generations (also called the digital natives) and decreases with age. Similarly, ONLINE*INCOME has a negative and significant coefficient. People with lower income seem to get higher benefits from using the Internet. Such a result is a strong argument to promote Internet access in a low-income population. We also find that using the Internet intensively (several times every day) is a significant source of satisfaction when all other things remain equal. This could justify public intervention to encourage more intensive use of the Internet.

We run similar regressions using Happiness as the dependent variable. In the literature on subjective well-being, it is sometimes argued that life satisfaction is a long term measure of well-being, whereas happiness is a short term measure. Even if this distinction is not so clear, it can be helpful to compare the results between Table 3 and Table 4.

INSERT TABLE 4

We find that Internet use has a positive impact on happiness: people that do not use the Internet tend to be less happy that the Internet users (whatever the time they spend online), but this impact is weakly significant (at 10% when we only control for socio-demographic variables). A possible interpretation could be that Internet use has

more long term than short term effects (more impact on life satisfaction than on happiness).

For the other variables, the effects are comparable to what we found for life satisfaction. Individuals that live with a partner, are young, healthy, and have a comfortable income are happier. Similarly, happiness is positively related to trust and freedom, but negatively related to fairness. Interaction variables with Internet use have no significant effects.

4.2 Robustness Checks

We can presume some endogeneity problems between Internet use and well-being. It is possible that omitted variables in the estimated models influence both the intensity of Internet use and well-being, or that people who are more satisfied with their life are more likely to use the Internet (inverse causality). For these reasons, we use instrumental variables to control for the endogeneity of Internet use. We first estimate the probability to have used the Internet over the last three months. Our instrument is the diffusion of the Internet among friends and family (whether most or few friends and family members use the Internet). We have reasons to believe that this variable is not correlated with the error term in the model of life satisfaction. For instance, Agarwal, Animesh and Prasad (2009) found that widespread Internet use among people who live in proximity has a direct effect on an individual's propensity to go online. Similarly, Goldfarb (2006) and Goolsbee and Zitrain (1999) provide evidence of peer effects in Internet use.

We first estimate an ordered logit model on the intensity of Internet use (with four levels – never, several times per month, once a day, several times per day). The explanatory variables are gender, age, occupational status, education, sociability, membership and volunteer. The two instrumental variables are Internet use among friends and family. Table 5 shows that people are more likely to spend time online when they are more educated and highly sociable and their friends and family are highly connected.

<center>INSERT TABLE 5 AND TABLE 6</center>

<center>17</center>

In the second stage, we estimate the ordered logit model of life satisfaction using the predicted value of online intensity (using the first stage logit model). Table 6 displays the results. We find that socio-demographic variables, social capital, and personal values and beliefs have the same influence on life satisfaction. However, Internet use has no more impact on well-being when we use instrumental variables for the Internet. This result suggests that the relationship between Internet use and life satisfaction is not clear-cut and is mediated through other variables.[15] However, our finding supports the fact that the digital divide causes dissatisfaction and that the gains of Internet use differ by age and income. But additional data are required to provide more robust tests and evidence in other countries.

5   Discussion and conclusion

In this article, we have studied the impact of Internet use on subjective well-being. First, we find evidence from country level data that the diffusion of the Internet in a country is positively correlated with the well-being of the population. But when we ran a regression of happiness on Internet penetration, GDP per capita, social capital and health, the Internet is no more significant. Our results suggest that the influence of the Internet on happiness is not direct, but passes through *non market interactions*.

To provide further evidence, we have focused our analysis on a specific country (Luxemburg) and used the EVS data to which we had the opportunity to add questions on the time spent online. This unique set of data allows us to examine more rigorously the causal relation between Internet use and subjective well-being. Our findings indicate that the first level of the digital divide (whether people use the Internet or not) generates more inequality in life satisfaction than the second level of the digital divide (between light and heavy Internet users). The marginal effect on well-being of spending an additional hour online is not significant. Moreover, Internet use is more influential on life satisfaction than on happiness, suggesting that digital use has long-term effects.

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[15] We run similar two-stage estimations using happiness and (non recoded) life satisfaction as dependant variables. The results are displayed in tables 7 and 8 (in appendix). In both cases, Internet use has no significant effect on well-being.

Finally, we find that the benefits of using the Internet are higher for low income people and the younger generation. These findings have clear implications. Policy that promotes digital literacy at school and in poor neighborhoods is welfare-enhancing and could maximize well-being in society as a whole.

Our research has several limitations. Our data in the second part of the article are cross-sectional and limited to one European country (Luxemburg). Further analyses have to be developed using more appropriate data (time-series and cross-country data) to have more robust measures of the short-term and long-term effects of Internet use on well-being. It would also be interesting to understand which kinds of online use have positive or negative effects on life satisfaction (communication, information search, online games, etc.). But, this paper is a first stone in this promising avenue to understand the interplay between digital use and well-being.

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Table 1: Cross-country regression on the determinants of happiness

Dependant variable Average happiness	1	2	3	4
Constant	6.15	-4.10	-1.53	-2.06
	(0.156)***	(1.42)**	(1.46)	(1.21)*
Rate of internet users	2.24	0.66	0.78	-0.254
	(0.247)***	(0.291)*	(0.241)**	(0.258)
Log GDP per Capita		1.09	0.512	0.544
		(0.150)***	(0.184)**	(0.147)***
Average health			1.15	0.825
			(0.193)***	(0.182)***
Average trust				0.330
				(0.06)***
R²	0,45	0,68	0,79	0,85
Observations	91	91	91	91

Note: Robust standard errors are given in parentheses. *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 2: Description and summary statistics of the variables

Variable	Description	Mean (Standard error)
HAPPINESS	All things consider would you say that you are: not very happy/not at all happy (=1), quite happy (=2), very happy (=3)	2.251 (0.748)
LIFE SATISFACTION1-10	All things considered, how satisfied are you with your life as a whole these days? Values from 1 (dissatisfied) to 10 (satisfied).	7.851 (2.036)
LIFE SATISFACTION	Value=1 when Life Satisfaction1-10 is between 1 and 6, = 2 when Life Satisfaction1-10 is equal to 7 or 8 and =3 when Life Satisfaction1-10 is equal to 9 or 10.	2.320 (0.572)
ONLINEDAY+	Use the Internet several times per day	0.379 (0.485)
ONLINEDAY	Use the Internet once a day	0.222 (0.416)
ONLINEMONTH	Use the Internet at least once a month (but not every day)	0.171 (0.376)
NOINTERNET	Has never used the Internet over the past 3 months	0.225 (0.418)
ONLINEINTENSE	Intensity of Internet use; Take value 0 if No Internet use, 1 if Internet use at least once a month, 2 if one a day and 3 if several times a day	2.486 (1.567)
AGE	Age of the respondent (from 19 to 89)	42.693 (17.107)
AGE2	Age squared	2115.184 (1643.369)
PARTNER	Married or with a partner	0.640 (0.480)
GENDER	Male	0.506 (0.500)
PRIMARY EDUCATION	Primary or first stage of basic education	0.339 (0.473)
SECONDARY EDUCATION	Upper secondary education (High school level)	0.361 (0.480)
TERTIARY EDUCATION STAGE 1	The first stage of Tertiary education (University License or Bachelor)	0.142 (0.349)
TERTIARY EDUCATION STAGE 2	The second stage of Tertiary education (Master, Doctorate)	0.156 (0.363)
FULLTIMEJOB	Has a full time salaried job (at least 30 hours a week) or is self employed (binary)	0.541 (0.498)
MEMBERSHIP	Membership in voluntary organisations (number)	2.316 (1.880)
VOLUNTEER	Volunteer in organisations (number)	1.593 (1.932)
SOCIABILITY	Intensity of meeting with friends, fellow workers, people attending the same church, clubs and associations	5.436 (2.369)
TRUSTOTHER	Trust in others (do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair? Takes value from 1 (Most people would try to take advantage of me) to 10 (Most people would try to be fair)	6.072 (2.263)
GOD	Believes in God	0.620 (0.485)
FREEDOM	Freedom of choice and control you feel you have over the way your life turns out. Some people feel they have completely free choice and control over their lives, and other people feel that what they do has no real effect on what happens to them. Takes value from 1 (no freedom of choice) to 10 (a great deal of freedom).	6.840 (2.301)

Variable	Description	Mean (Standard error)
FAIRNESS	Preference for equal incomes. Takes value 1 (There should be greater incentives for individual effort) to 10 (Incomes should be made more equal)	4.636 (2.658)
TRUSTINSTITUTION	Measure of confidence in institutions (press, trade union, police, parliament, government, justice, political parties, civil service).	5.626 (3.350)
HEALTH	Satisfaction level regarding health (are you satisfied with your health?). Takes value from 1 (Very unsatisfied) to 7 (Very satisfied).	5.563 (1.532)
INCOME	Satisfaction level regarding income (are you satisfied with your income?). Takes value from 1 (Very unsatisfied) to 7 (Very satisfied).	5.068 (1.725)
ONLINE*AGE	Interaction between ONLINEINTENSE and AGE	66.707 (53.767)
ONLINE*PARTNER	Interaction between ONLINEINTENSE and PARTNER	1.055 (1.250)
ONLINE*GENDER	Interaction between ONLINEINTENSE and GENDER	0.946 (1.276)
ONLINE*SOCIABILITY	Interaction between ONLINEINTENSE and SOCIABILITY	10.328 (8.528)
ONLINE*INCOME	Interaction between ONLINEINTENSE and INCOME	8.948 (7.007)
FRIENDINTERNET	Most of my friends use the Internet	0.849 (0.357)
FAMILYINTERNET	Most of family members use the Internet	0.843 (0.363)

Table 3: The determinants of life satisfaction (ordered logit model)

Dependant variable: LIFE SATISFACTION					
	1	2	3	4	5
ONLINEDAY+	0.0342	0.0254	-0.0828	-0.0130	1.0515**
	(0.1601)	(0.1612)	(0.1665)	(0.1702)	(0.4778)
ONLINEDAY	-0.1442	-0.1806	-0.2306	-0.1757	0.3440
	(0.1675)	(0.1684)	(0.1731)	(0.1770)	(0.2835)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.5741***	-0.4746***	-0.5089***	-0.3962**	-1.1281***
	(0.1836)	(0.1853)	(0.1928)	(0.1974)	(0.3348)
AGE	-0.0581***	-0.0617***	-0.0521**	-0.0430**	-0.00699
	(0.0198)	(0.0200)	(0.0208)	(0.0213)	(0.0253)
AGESQUARED	0.000799***	0.000836***	0.000714***	0.000603***	0.000362
	(0.000211)	(0.000213)	(0.000222)	(0.000226)	(0.000242)
PARTNER	0.4019***	0.4642***	0.4327***	0.3023**	0.1386
	(0.1200)	(0.1210)	(0.1255)	(0.1297)	(0.2342)
GENDER	0.1409	0.0847	0.1537	0.1724	0.3933*
	(0.1098)	(0.1111)	(0.1157)	(0.1188)	(0.2118)
PRIMARY EDUCATION	-0.00455	0.0395	0.0793	0.1320	0.1271
	(0.1300)	(0.1312)	(0.1366)	(0.1400)	(0.1404)
SECONDARY EDUCATION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.1724	0.0922	0.1063	0.0142	0.0135
	(0.1679)	(0.1691)	(0.1755)	(0.1798)	(0.1805)
TERTIARY EDUCATION STAGE 2	-0.1446	-0.1270	-0.2737	-0.3844**	-0.3554**
	(0.1687)	(0.1699)	(0.1749)	(0.1787)	(0.1790)
FULLTIMEJOB	0.2132*	0.2044	0.1594	0.0185	0.00663
	(0.1240)	(0.1249)	(0.1286)	(0.1324)	(0.1339)
MEMBERSHIP		0.0541	0.0332	0.0322	0.0303
		(0.0392)	(0.0409)	(0.0413)	(0.0414)
VOLUNTEER		0.0487	0.0621	0.0626	0.0643
		(0.0402)	(0.0416)	(0.0421)	(0.0424)
SOCIABILITY		0.0658***	0.0552**	0.0438*	0.0571
		(0.0250)	(0.0258)	(0.0264)	(0.0440)
TRUSTOTHER			0.1013***	0.0623**	0.0584**
			(0.0253)	(0.0262)	(0.0265)
GOD			-0.0773	-0.0664	-0.0640
			(0.1154)	(0.1183)	(0.1186)
FREEDOM			0.2659***	0.2357***	0.2336***
			(0.0249)	(0.0255)	(0.0256)
FAIRNESS			-0.0506**	-0.0441**	-0.0500**
			(0.0205)	(0.0210)	(0.0213)
TRUSTINSTITUTION			0.0581***	0.0554***	0.0571***
			(0.0168)	(0.0173)	(0.0174)
HEALTH				0.3153***	0.3241***
				(0.0401)	(0.0404)
INCOME				0.2017***	0.2554***
				(0.0357)	(0.0593)
ONLINE*AGE					-0.00884**
					(0.00363)

Dependant variable: LIFE SATISFACTION					
	1	2	3	4	5
ONLINE*PARTNER					0.0987
					(0.1075)
ONLINE*GENDER					-0.1140
					(0.0969)
ONLINE*SOCIABILITY					-0.00954
					(0.0209)
ONLINE*INCOME					-0.0296***
					(0.0284)
CUT3	0.2273	-0.2845	-2.8274***	-5.2162***	-5.9888***
	(0.4128)	(0.4413)	(0.5276)	(0.5900)	(0.6530)
CUT2	2.0192***	1.5328***	-0.8073	-3.0354***	-3.7947***
	(0.4164)	(0.4431)	(0.5214)	(0.5762)	(0.6382)
Observations	1332	1332	1332	1332	1332
-2 Log L	2716.252	2691.952	2511.888	2385.203	2375.540
% of values predicted correctly	59.6	61.9	70.7	74.8	75.0

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 4: The determinants of happiness (ordered logit model)

Dependant variable: HAPPINESS					
	1	2	3	4	5
ONLINEDAY+	0.1693	0.1676	0.0955	0.1547	0.7894
	(0.1691)	(0.1699)	(0.1737)	(0.1760)	(0.4930)
ONLINEDAY	-0.0840	-0.0998	-0.1369	-0.1025	0.2067
	(0.1783)	(0.1790)	(0.1822)	(0.1849)	(0.2939)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.3621*	-0.3000	-0.3322*	-0.2221	-0.6825**
	(0.1952)	(0.1970)	(0.2017)	(0.2043)	(0.3456)
AGE	-0.0844***	-0.0861***	-0.0780***	-0.0654***	-0.0462*
	(0.0207)	(0.0209)	(0.0212)	(0.0216)	(0.0259)
AGESQUARED	0.000862***	0.000879***	0.000757***	0.000615***	0.000499**
	(0.000217)	(0.000219)	(0.000222)	(0.000226)	(0.000243)
PARTNER	0.8184***	0.8515***	0.8228***	0.7273***	0.9017***
	(0.1318)	(0.1328)	(0.1353)	(0.1378)	(0.2443)
GENDER	-0.2189*	-0.2565**	-0.2586**	-0.2709**	-0.0985
	(0.1173)	(0.1187)	(0.1220)	(0.1241)	(0.2168)
PRIMARY EDUCATION	-0.0266	-0.00495	0.0232	0.0655	0.0666
	(0.1393)	(0.1403)	(0.1434)	(0.1457)	(0.1459)
SECONDARY EDUCA-TION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.2880	0.2473	0.2176	0.1546	0.1542
	(0.1757)	(0.1767)	(0.1818)	(0.1842)	(0.1849)
TERTIARY EDUCATION STAGE 2	-0.0376	-0.0188	-0.1328	-0.2364	-0.2266
	(0.1793)	(0.1801)	(0.1837)	(0.1869)	(0.1875)
FULLTIMEJOB	0.2451*	0.2379*	0.2117	0.1145	0.1169
	(0.1329)	(0.1338)	(0.1362)	(0.1390)	(0.1405)
MEMBERSHIP		-0.00496	-0.0142	-0.0149	-0.0167
		(0.0407)	(0.0416)	(0.0423)	(0.0424)
VOLUNTEER		0.0743*	0.0828*	0.0800*	0.0852**
		(0.0416)	(0.0425)	(0.0432)	(0.0434)
SOCIABILITY		0.0338	0.0196***	0.00959	0.0235
		(0.0266)	(0.0272)	(0.0276)	(0.0454)
TRUSTOTHER			0.1166***	0.0829***	0.0802***
			(0.0268)	(0.0273)	(0.0276)
GOD			0.0281	0.0262	0.0197
			(0.1214)	(0.1233)	(0.1237)
FREEDOM			0.1105***	0.0760***	0.0750***
			(0.0257)	(0.0262)	(0.0263)
FAIRNESS			-0.0548**	-0.0450**	-0.0504**
			(0.0216)	(0.0219)	(0.0221)
TRUSTINSTITUTION			0.0690***	0.0666***	0.0680***
			(0.0176)	(0.0179)	(0.0180)
HEALTH				0.3094***	0.3113***
				(0.0439)	(0.0441)
INCOME				0.1363***	0.1266**
				(0.0383)	(0.0619)
ONLINE*AGE					-0.00490
					(0.00373)
ONLINE*PARTNER					-0.0878
					(0.1118)
ONLINE*GENDER					-0.0970
					(0.1003)
ONLINE*SOCIABILITY					-0.00998
					(0.0217)
ONLINE*INCOME					0.00710
					(0.0295)
Observations	1332	1332	1332	1332	1332
-2 Log L	2193.671	2184.261	2105.869	2019.172	2015.047
% of values predicted correctly	60.8	61.6	66.9	71.0	71.0

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 5: The determinant of Internet use (ordered logit model)

Dependant variable: ONLINEINTENSE	
AGE	-0.00970
	(0.0213)
AGESQUARED	-0.00031
	(0.000229)
PARTNER	-0.1356
	(0.1296)
GENDER	0.4967***
	(0.1167)
PRIMARY EDUCATION	-0.6670***
	(0.1321)
SECONDARY EDUCATION	REF.
TERTIARY EDUCATION STAGE 1	0.7009***
	(0.1694)
TERTIARY EDUCATION STAGE 2	1.7588***
	(0.1940)
FRIENDINTERNET	1.8119***
	(0.2050)
FAMILYINTERNET	0.9183***
	(0.1663)
FULLTIMEJOB	-0.0231
	(0.1290)
MEMBERSHIP	-0.0352
	(0.0407)
VOLUNTEER	-0.0109
	(0.0410)
SOCIABILITY	0.1030***
	(0.0263)
Observations	1332
-2 Log L	2830.076
% of values correctly predicted	79.1

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 6: The determinants of life satisfaction (ordered logit model with instrumental variables)

Dependant variable: LIFE SATISFACTION (IV)					Coefficient (standard error)
ONLINEDAY+	0.1750 (0.2242)	0.0839 (0.2275)	0.1213 (0.2349)	0.0208 (0.2402)	0.00203 (0.2417)
ONLINEDAY	-0.0544 (0.2355)	-0.0786 (0.2375)	0.0539 (0.2454)	0.0792 (0.2523)	0.0557 (0.2533)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.3273 (0.2109)	-0.2152 (0.2131)	-0.1376 (0.2203)	-0.0727 (0.2261)	-0.0680 (0.2314)
AGE	-0.0539*** (0.0207)	-0.0595*** (0.0208)	-0.0506** (0.0216)	-0.0448** (0.0221)	-0.0353 (0.0244)
AGESQUARED	0.000760*** (0.000216)	0.000804*** (0.000218)	0.000689*** (0.000227)	0.000597*** (0.000232)	0.000531** (0.000242)
PARTNER	0.4046*** (0.1198)	0.4664*** (0.1208)	0.4381*** (0.1253)	0.3041** (0.1295)	0.0455 (0.2299)
GENDER	0.1029 (0.1119)	0.0703 (0.1127)	0.1310 (0.1174)	0.1751 (0.1205)	0.3039 (0.2092)
PRIMARY EDUCATION	0.0417 (0.1421)	0.0505 (0.1435)	0.0984 (0.1489)	0.1091 (0.1529)	0.1196 (0.1535)
SECONDARY EDUCA-TION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.1503 (0.1740)	0.1020 (0.1750)	0.1151 (0.1813)	0.0582 (0.1855)	0.0384 (0.1869)
TERTIARY EDUCATION STAGE 2	-0.1508 (0.1748)	-0.0987 (0.1763)	-0.2592 (0.1813)	-0.3155 (0.1847)	-0.3414* (0.1896)
FULLTIMEJOB	0.2095* (0.1239)	0.2030 (0.1248)	0.1603 (0.1286)	0.0217 (0.1325)	0.00382 (0.1337)
MEMBERSHIP		0.0553 (0.0394)	0.0327 (0.0410)	0.0290 (0.0414)	0.0296 (0.0414)
VOLUNTEER		0.0480 (0.0402)	0.0644 (0.0417)	0.0663 (0.0422)	0.0652 (0.0424)
SOCIABILITY		0.0674*** (0.0254)	0.0561** (0.0262)	0.0479* (0.0268)	0.0217 (0.0402)
TRUSTOTHER			0.1030*** (0.0253)	0.0642** (0.0262)	0.0660** (0.0263)
GOD			-0.0758 (0.1155)	-0.0719 (0.1184)	-0.0613 (0.1188)
FREEDOM			0.2660*** (0.0249)	0.2357*** (0.0255)	0.2340*** (0.0256)
FAIRNESS			-0.0544*** (0.0204)	-0.0475** (0.0210)	-0.0467** (0.0211)
TRUSTINSTITUTION			0.0544*** (0.0167)	0.0528*** (0.0172)	0.0517*** (0.0173)
HEALTH				0.3176*** (0.0402)	0.3217*** (0.0404)
INCOME				0.2033*** (0.0357)	0.1992*** (0.0539)
ONLINE*AGE					-0.00216 (0.00291)
ONLINE*PARTNER					0.1405 (0.1061)
ONLINE*GENDER					-0.0703 (0.0955)
ONLINE*SOCIABILITY					0.0136 (0.0176)
ONLINE*INCOME					0.00198 (0.0250)
Observations	1332	1332	1332	1332	1332
-2 Log L	2723.968	2699.255	2518.483	2390.103	2387.089
% of values correctly predic-ted	58.9	61.3	70.4	74.7	74.7

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

APPENDIX

Table 7: The determinants of life satisfaction (ordered logit model)

Dependant variable: LIFE SATISFACTION1-10					
	1	2	3	4	5
ONLINEDAY+	0.0154 (0.1497)	0.0102 (0.1502)	-0.0750 (0.1519)	0.00249 (0.1526)	1.3091*** (0.4227)
ONLINEDAY	-0.1543 (0.1573)	-0.1864 (0.1577)	-0.2029 (0.1589)	-0.1453 (0.1597)	0.5080** (0.2521)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.4883*** (0.1717)	-0.3873** (0.1729)	-0.4083** (0.1756)	-0.2769 (0.1768)	-1.0318*** (0.2961)
AGE	-0.0652*** (0.0183)	-0.0688*** (0.0185)	-0.0611*** (0.0187)	-0.0526*** (0.0188)	-0.0299 (0.0225)
AGESQUARED	0.000883*** (0.000194)	0.000922*** (0.000195)	0.000815*** (0.000198)	0.000708*** (0.000199)	0.000562*** (0.000213)
PARTNER	0.4529*** (0.1133)	0.5031*** (0.1139)	0.4987*** (0.1154)	0.3553*** (0.1167)	0.4751** (0.2064)
GENDER	0.1411 (0.1031)	0.0890 (0.1039)	0.1318 (0.1059)	0.1325 (0.1067)	0.1854 (0.1875)
PRIMARY EDUCATION	0.0258 (0.1223)	0.0661 (0.1230)	0.1172 (0.1249)	0.1588 (0.1257)	0.1653 (0.1259)
SECONDARY EDUCATION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.1063 (0.1562)	0.0407 (0.1569)	0.0539 (0.1593)	-0.0188 (0.1603)	-0.0125 (0.1608)
TERTIARY EDUCATION STAGE 2	-0.1361 (0.1584)	-0.1097 (0.1589)	-0.2274 (0.1607)	-0.3503** (0.1618)	-0.3240** (0.1621)
FULLTIMEJOB	0.2182* (0.1167)	0.2126* (0.1172)	0.1942* (0.1182)	0.0670 (0.1195)	0.0768 (0.1206)
MEMBERSHIP		0.0402 (0.0361)	0.00684 (0.0366)	0.0131 (0.0367)	0.0110 (0.0367)
VOLUNTEER		0.0528 (0.0370)	0.0767** (0.0375)	0.0677* (0.0376)	0.0701* (0.0378)
SOCIABILITY		0.0567** (0.0234)	0.0452* (0.0236)	0.0338 (0.0237)	0.0770** (0.0392)
TRUSTOTHER			0.0958*** (0.0232)	0.0552** (0.0236)	0.0498** (0.0238)
GOD			-0.0612 (0.1057)	-0.0580 (0.1064)	-0.0663 (0.1066)
FREEDOM			0.2936*** (0.0231)	0.2570 (0.0232)	0.2537*** (0.0233)
FAIRNESS			-0.0489*** (0.0187)	-0.0411** (0.0189)	-0.0464** (0.0190)
TRUSTINSTITUTION			0.0516*** (0.0153)	0.0443*** (0.0154)	0.0470*** (0.0155)
HEALTH				0.3384*** (0.0365)	0.3394*** (0.0367)
INCOME				0.2083*** (0.0326)	0.2996*** (0.0526)
ONLINE*AGE					-0.00558* (0.00324)
ONLINE*PARTNER					-0.0470 (0.0954)
ONLINE*GENDER					-0.0250 (0.0865)
ONLINE*SOCIABILITY					-0.0252 (0.0187)
ONLINE*INCOME					-0.0499** (0.0251)
Observations	1332	1332	1332	1332	1332
-2 Log L	4941.668	4919.528	4699.219	4540.074	4529.420
% of values correctly predicted	58.3	59.9	68.0	71.8	72.0

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 8: The determinants of happiness (ordered logit model with instrumental variables)

Dependant variable: HAPPINESS (IV)					
	1	2	3	4	5
ONLINEDAY+	-0.2328 (0.2378)	-0.3178 (0.2410)	-0.3043 (0.2465)	-0.4234* (0.2515)	-0.4489* (0.2540)
ONLINEDAY	-0.3320 (0.2522)	-0.3460 (0.2537)	-0.2933 (0.2588)	-0.3180 (0.2636)	-0.3474 (0.2652)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.1227 (0.2240)	-0.0460 (0.2260)	0.0346 (0.2311)	0.0881 (0.2353)	0.1664 (0.2414)
AGE	-0.0876*** (0.0216)	-0.0909*** (0.0217)	-0.0826*** (0.0221)	-0.0729*** (0.0225)	-0.0734*** (0.0249)
AGESQUARED	0.000834*** (0.000223)	0.000859*** (0.000224)	0.000728*** (0.000228)	0.000603*** (0.000232)	0.000624** (0.000243)
PARTNER	0.7962*** (0.1315)	0.8364*** (0.1326)	0.8145*** (0.1353)	0.7136*** (0.1378)	0.7914*** (0.2410)
GENDER	-0.1663 (0.1195)	-0.1940 (0.1203)	-0.2018 (0.1238)	-0.1892 (0.1258)	-0.0932 (0.2162)
PRIMARY EDUCATION	-0.1575 (0.1520)	-0.1653 (0.1535)	-0.1381 (0.1568)	-0.1398 (0.1595)	-0.1147 (0.1603)
SECONDARY EDUCATION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.3978** (0.1825)	0.3809** (0.1836)	0.3521* (0.1882)	0.3249* (0.1911)	0.2838 (0.1925)
TERTIARY EDUCATION STAGE 2	0.1240 (0.1862)	0.1751 (0.1876)	0.0492 (0.1910)	-0.00484 (0.1941)	-0.0936 (0.1989)
FULLTIMEJOB	0.2583* (0.1330)	0.2492* (0.1338)	0.2273* (0.1363)	0.1337 (0.1391)	0.1249 (0.1405)
MEMBERSHIP		-0.00668 (0.0408)	-0.0153 (0.0417)	-0.0177 (0.0424)	-0.0163 (0.0425)
VOLUNTEER		0.0742* (0.0418)	0.0830* (0.0426)	0.0805* (0.0433)	0.0827* (0.0435)
SOCIABILITY		0.0503* (0.0270)	0.0370 (0.0276)	0.0298 (0.0280)	0.0156 (0.0419)
TRUSTOTHER			0.1209* (0.0268)	0.0873*** (0.0273)	0.0902*** (0.0275)
GOD			-0.00771 (0.1217)	-0.0152 (0.1237)	-0.00018 (0.1242)
FREEDOM			0.1096*** (0.0257)	0.0748** (0.0262)	0.0738*** (0.0263)
FAIRNESS			-0.0581*** (0.0216)	-0.0479** (0.0219)	-0.0461** (0.0221)
TRUSTINSTITUTION			0.0669*** (0.0175)	0.0654*** (0.0178)	0.0640*** (0.0179)
HEALTH				0.3174*** (0.0440)	0.3192*** (0.0442)
INCOME				0.1368*** (0.0382)	0.0876 (0.0573)
ONLINE*AGE					0.000073 (0.00298)
ONLINE*PARTNER					-0.0394 (0.1105)
ONLINE*GENDER					-0.0637 (0.0995)
ONLINE*SOCIABILITY					0.00555 (0.0184)
ONLINE*INCOME					0.0293 (0.0264)
Observations	1332	1332	1332	1332	1332
-2 Log L	2200.492	2188.440	2108.777	2018.690	2013.614
% of values correctly predicted	60.2	61.5	66.9	71.2	71.4

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%

Table 9: The determinants of life satisfaction (ordered logit model with instrumental variables)

Dependant variable: LIFE SATISFACTION1-10 (IV)					
ONLINEDAY+	0.2013	0.1168	0.1731	0.0798	0.0722
	(0.2104)	(0.2127)	(0.2149)	(0.2164)	(0.2178)
ONLINEDAY	-0.1286	-0.1634	-0.0945	-0.1243	-0.1335
	(0.2216)	(0.2226)	(0.2245)	(0.2259)	(0.2267)
ONLINEMONTH	REF.	REF.	REF.	REF.	REF.
NOINTERNET	-0.3274*	-0.2302	-0.1453	-0.0755	-0.0616
	(0.1982)	(0.1995)	(0.2014)	(0.2029)	(0.2077)
AGE	-0.0591***	-0.0642***	-0.0552***	-0.0487**	-0.0528**
	(0.0191)	(0.0192)	(0.0194)	(0.0195)	(0.0215)
AGESQUARED	0.000842***	0.000883***	0.000764***	0.000665***	0.000688***
	(0.000199)	(0.000200)	(0.000203)	(0.000204)	(0.000212)
PARTNER	0.4563***	0.5038***	0.5004***	0.3519***	0.3511*
	(0.1132)	(0.1138)	(0.1154)	(0.1166)	(0.2043)
GENDER	0.0987	0.0684	0.0971	0.1199	0.1051
	(0.1052)	(0.1056)	(0.1076)	(0.1084)	(0.1867)
PRIMARY EDUCATION	0.1003	0.1108	0.1682	0.1672	0.1727
	(0.1337)	(0.1347)	(0.1365)	(0.1373)	(0.1378)
SECONDARY EDUCATION	REF.	REF.	REF.	REF.	REF.
TERTIARY EDUCATION STAGE 1	0.0573	0.0210	0.0258	-0.0207	-0.0221
	(0.1620)	(0.1626)	(0.1647)	(0.1657)	(0.1667)
TERTIARY EDUCATION STAGE 2	-0.1835	-0.1281	-0.2735	-0.3528**	-0.3590**
	(0.1645)	(0.1653)	(0.1670)	(0.1679)	(0.1719)
FULLTIMEJOB	0.2119µ	0.2088*	0.1909	0.0663	0.0707
	(0.1168)	(0.1173)	(0.1182)	(0.1195)	(0.1206)
MEMBERSHIP		0.0443	0.0112	0.0163	0.0171
		(0.0362)	(0.0367)	(0.0368)	(0.0368)
VOLUNTEER		0.0487	0.0734*	0.0648*	0.0621
		(0.0371)	(0.0376)	(0.0377)	(0.0379)
SOCIABILITY		0.0557**	0.0441*	0.0356	0.0277
		(0.0238)	(0.0240)	(0.0241)	(0.0361)
TRUSTOTHER			0.0957***	0.0552**	0.0551**
			(0.0232)	(0.0236)	(0.0236)
GOD			-0.0569	-0.0605	-0.0598
			(0.1059)	(0.1066)	(0.1069)
FREEDOM			0.2941***	0.2570***	0.2571***
			(0.0231)	(0.0233)	(0.0233)
FAIRNESS			-0.0522***	-0.0437**	-0.0424**
			(0.0187)	(0.0188)	(0.0189)
TRUSTINSTITUTION			0.0485***	0.0423***	0.0427***
			(0.0152)	(0.0153)	(0.0154)
HEALTH				0.3398***	0.3385***
				(0.0366)	(0.0368)
INCOME				0.2090***	0.2340***
				(0.0326)	(0.0487)
ONLINE*AGE					0.00134
					(0.00255)
ONLINE*PARTNER					0.00167
					(0.0947)
ONLINE*GENDER					0.00759
					(0.0856)
ONLINE*SOCIABILITY					0.00462
					(0.0158)
ONLINE*INCOME					-0.0141
					(0.0224)
Observations	1332	1332	1332	1332	1332
-2 Log L	4944.556	4922.991	4702.331	4542.479	4541.985
% of values correctly predicted	58.1	59.6	67.8	71.9	71.9

Note: *** coefficients significant at 1%, ** significant at 5%, * significant at 10%