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Digitization, Uncertainty, and Happiness Sustainability

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Motivation and research problem

The massive use of digital technology transformed individual and social values and attitudes, affecting perceptions of uncertainty, inequalities, and subjective well-being of the individuals. Moreover, it caused the digital divide in economic, political, cultural, and social arenas (Ragnedda, 2018).

Digitalization (understood as "the adoption or increase in the use of digital or computer technology by an organization, industry, country, individuals, etc." (Brennen and Kreiss, 2016) decreases unemployment, enhances the quality of life, raises citizens' access to public services, and broadens and enlarges social capital (Parviainen et al., 2017; Mandarano et al., 2010; Meier & Reinecke, 2020; Villanueva-Mansilla et al., 2015).

Active use of social media, the Internet, and mobile phones does have an effect on happiness and mental health which is directly linked with the sustainable development of any society (Kavetsos & Koutroumpis, 2011; Graham & Nikolova, 2013; Ganju et al., 2016; Hong and Chang, 2020).

Research questions

Under the circumstances of massive digitization of social life, further questions could be raised to investigate:

1) How much access to the internet and possession of mobile phones contributes to the happiness sustainability at individual level?

2) Do the mobile penetration, usage of Interment and social media on country level affects job instability, perceptions of uncertainty, perception of the future well-being at individual level across the Globe?

3) Do the mobile penetration, usage of Internet and social media on country level have moderation effects on subjective well-being via job instability, perceptions of uncertainty and economic growth at individual level?

Goal of the study

Observe how digitization affects current and future individual's life evaluation

Determine the link between access to the Internet, and possession of mobile phones, on the one hand, and perceptions of uncertainty, life evaluations, job instability, on the other hand.

To test for moderation effects from the digitization of the society (mobile phone penetration, internet usage and social media usage) on individual life satisfaction via individual internet usage and perceptions of uncertainty and economic growth.

Previous studies showed...

Despite the incredible spread of Internet technologies, there is still limited knowledge about their effects on individuals' well-being (Castellacci & Tveito, 2018).

The existing studies on SWB were mainly focused on the GDP or economic growth as macro-level predictors (Sarracino, 2013; Mikucka et al., 2017; Powdthavee et al., 2013).

Not that many investigations discuss the impact of the digital divide and usage of ICT on individual well-being (Kavetsos and Koutroumpis, 2011; Graham and Nikolova, 2013; Pénard et al., 2013; Ganju et al., 2015).

According to Vanden Abeele (2020), the digital experience may have a long-lasting effect and may, directly and indirectly, relate to digital well-being states

Positive effects of digitization on life satisfaction and happiness

In high mobile and Internet penetration countries, the users report higher levels of life satisfaction (Kavetsos & Koutroumpis, 2011).
Online activities such as instant messaging, using emails, online entertainment, and online shopping have a significant positive impact on subjective well-being (Pénard, et al., 2013; Lissitsa and Chachashvili-Bolotin, 2016; Arampatzi, et al., 2018; Guillen-Royo, 2019; Hong and Chang, 2020; Castellacci & Schwabe, 2020).
Social media use, the intensity of Facebook usage improve life satisfaction (Valenzuela, et al., 2009; Graham and Nikolova 2013; Dogan, 2016; Gerson et al., 2016; Hwang, et al., 2019; Phu & Gow, 2019).
Internet skills indirectly have a very strong and positive effect via Internet use and belongingness on social well-being (Buchi, et al., 2018).

ICT and subjective well-being: positive results

Authors	DV	IV	Main results
Valenzuela, Park & Kee, (2009)	Life satisfaction	Intensity of Facebook Use	Intensity of Facebook use was positively associated with life satisfaction (β = .15***) and social trust (β = .05***).
Kavetsos & Koutroumpis, (2011)	Life satisfaction	Technological amenities under the possession of individual country. Mobile and broadband penetration variables.	Positive significant association with LS: fixed phones (5.8%), mobile phones (+0.7%), a CD player (4%), personal computer (3.3%.). Mobile phone (0.059***) and internet users (0.188***) in high penetration countries report higher levels of life satisfaction.
Pénard, Poussing, & Suire, (2012)	Life satisfaction and Happiness.	Internet usage	The non-use of the Internet has a negative significant impact (-0.5741***) on LS and (-0.3621*) on happiness. A positive significant relation between the rate of Internet users and happiness (0.247***).
Graham & Nikolova, (2013)	Best Possible Life, Positive hedonic well-being (smile), Negative hedonic well- being (stress/anger).	Having a landline telephone, a cellular phone, a television, access to the Internet.	Having in home: Landline (0.315***; 0.129***), Cell Phone (0.355***; 0.261***), TV (0.581***; 0.198***), Internet (0.514***; 0.231***) have positive significant relationships with BPL and Smile, but negative significant associations with Stress and Anger.
Chan, M. (2015).	Psychological and emotional well-being.	Mobile phone use	Mobile voice communication is positively related to (0.15**) psychological well-being. Mobile online and voice communication was higher related to positive affect (0.19*; 0.10*).
Dogan, (2016)	Happiness Psychological Well-being Life Satisfaction	SNS Use (Facebook and Twitter)	SNS use was significantly associated with happiness (0.61***), life satisfaction (0.91***), and psychological well-being (0.92***).
Lissitsa & Chachashvili-Bolotin, (2016)	Life satisfaction (LS).	Internet Users	Positive significant association between Internet use and life satisfaction (0.12**).
Gerson, Plagnol & Corr, (2016)	Life satisfaction (LS). Eudaimonic well-being (EWB).	Facebook Use Intensity; Facebook social comparison.	Positive significant associations between Facebook intensity (1.37**;) and LS as well as Facebook intensity (2.34***) and EWB. Negative significant associations between Facebook social comparison and both: LS (-0.22***), and EWB (-0.26***).
Ganju, Pavlou & Banker, (2016)	Well-being: Best Possible Life	ICT usage: (1) fixed telephone lines, (2) Internet users, and (3) mobile phones.	The total ICT (Low ICT=0.01324***, Medium ICT=0.01530*, High ICT=0.01489**) have a positive and significant effect on well-being.
Hwang et al., (2019)	Life satisfaction	SNS usage: Hedonic and Utilitarian.	The significant positive relationship between the utilitarian use of Facebook (β = 0.123, t = 1.729, p-value = 0.084*) and LS.
Phu & Gow, (2019)	Happiness loneliness	The Multidimensional Facebook Intensity Scale	Number of Facebook friends is positive significant predictor of subjective happiness (0.202***) and negative significant predictor of loneliness (−0.232***).
Guillen-Royo, (2019)	SWB: Life satisfaction and Happiness.	On-line shopping	Positive significant associations between frequency of online shopping and life satisfaction (0.071*) and happiness (0.270**).
Hong & Chang, (2020)	Life satisfaction (LS).	Internet Use	Positive significant association between internet connection at home (0.74**) and

Negative effects of digitization on life satisfaction and happiness

A few studies demonstrated a negative correlation or no effect at all between subjective well-being and mobile phone usage and Internet usage (SNS activities) (Aarts, et al., 2015; Chan, 2015; Buchi, et al., 2018; Arampatzi, et al., 2018).

Permanent online connection through mobile phone use did not affect subjective well-being (Lin, 2019).

The misuse (addiction to or dependence on) of social media or game playing may be associated with lower life satisfaction (Lissitsa and Chachashvili-Bolotin, 2016).

ICT and subjective well-being: negative results

Authors	DV	IV	Main results
Aarts, Peek & Wouters, (2015)	Loneliness Mental Health Inventory	Social Network Site (SNS) usage	No significant relationship between SNS usage and loneliness and mental health.
Chan, M. (2015).	Psychological and emotional well-being.	Mobile phone use	Information seeking activities were negatively related positive affect (–0.12*).
Lissitsa & Chachashvili-Bolotin, (2016)	Life satisfaction (LS).	Internet Users	No significant impact of information search, social media usage and online games on life satisfaction
Gerson, Plagnol & Corr, (2016)	Life satisfaction (LS). Eudaimonic well-being (EWB).	Facebook Use Intensity; Facebook social comparison.	Negative significant associations between Facebook social comparison and both: LS (-0.22***), and EWB (-0.26***).
Büchi, Festic, & Latzer, (2018)	Social Well-being	Internet Use Internet Skills	Internet use and Internet skills had no significant effect on social well-being. Indirect effect of Internet skills on social well-being via Internet belongingness was (0.19***).
Arampatzi, Burger & Novik, (2018)	Happiness	SNS activities	Time spent on SNSs (-0.123**) and frequent use of SNS (-0.053**) negatively affected happiness.

Note [1]. Main results in this table present only the relationship between the digitalization, ICT diffusion and SWB.
Note [2]. IV = Independent Variable; DV = Dependent Variable; *p<0.05; **p<0.01; ***p<0.001.

Data description

GALLUP WORLD POLL (GWP)

156 countries

2019 wave of data collection

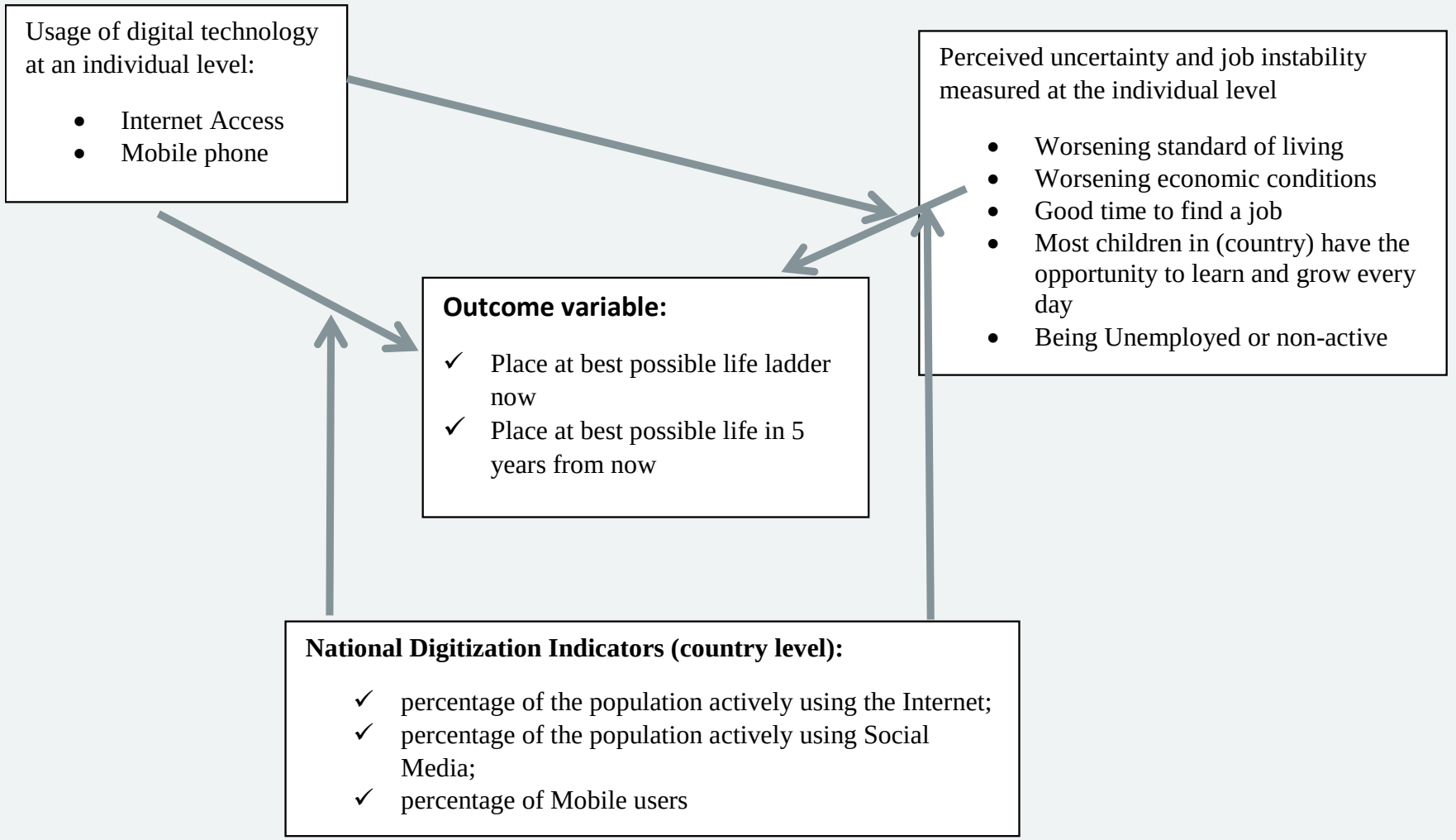
1000-3000 sample size, nationally representative

WORLD VALUE SURVEY (WVS)

World Value Survey: the recent wave of 2017-2020

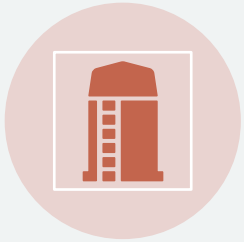
46 countries with nationally representative samples of about 1200-2500 respondents each

Conceptual framework

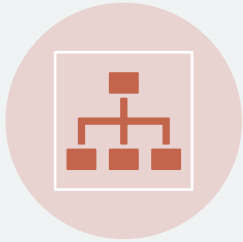


Methodology: dependent variable

Gallup world poll



Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder do you feel you personally stand at the present time?



Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. Just your best guess, on which step do you think you will stand on in the future, say about five years from now?

Gallup World POLL (INDEPENDENT PREDICTORS)

UNCERTAINTY PERCEPTIONS

INTERNET AND MOBILE PHONE USAGE

- Does your home or the place you live have access to the Internet?
- Do you have a mobile phone?
- Do you have access to Internet (via mobile phone or computer)?

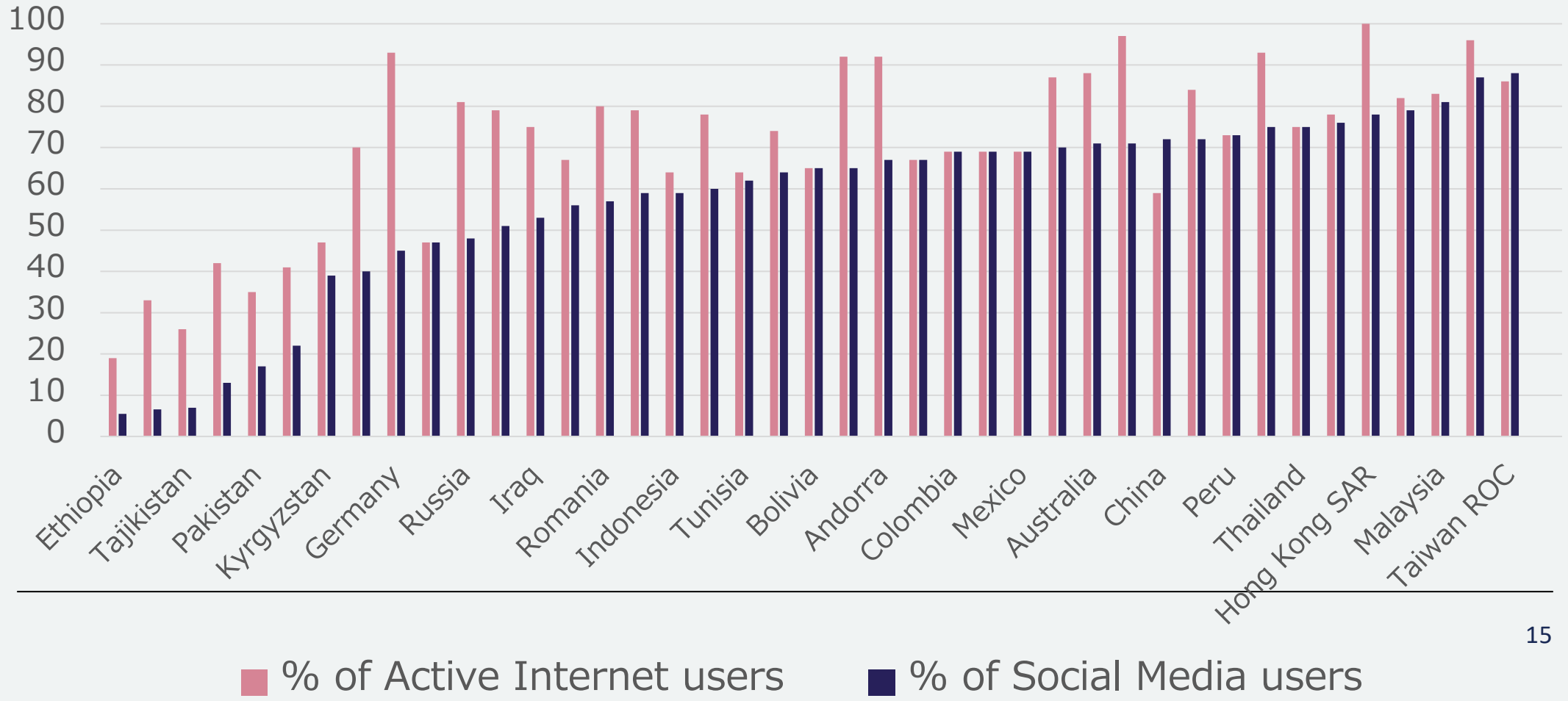
Methodology: country level variables

At the country level, three national digitalization indicators from the Digital Report 2020 were added to a) the individual data of the Gallup World Poll and b) World Value Survey:

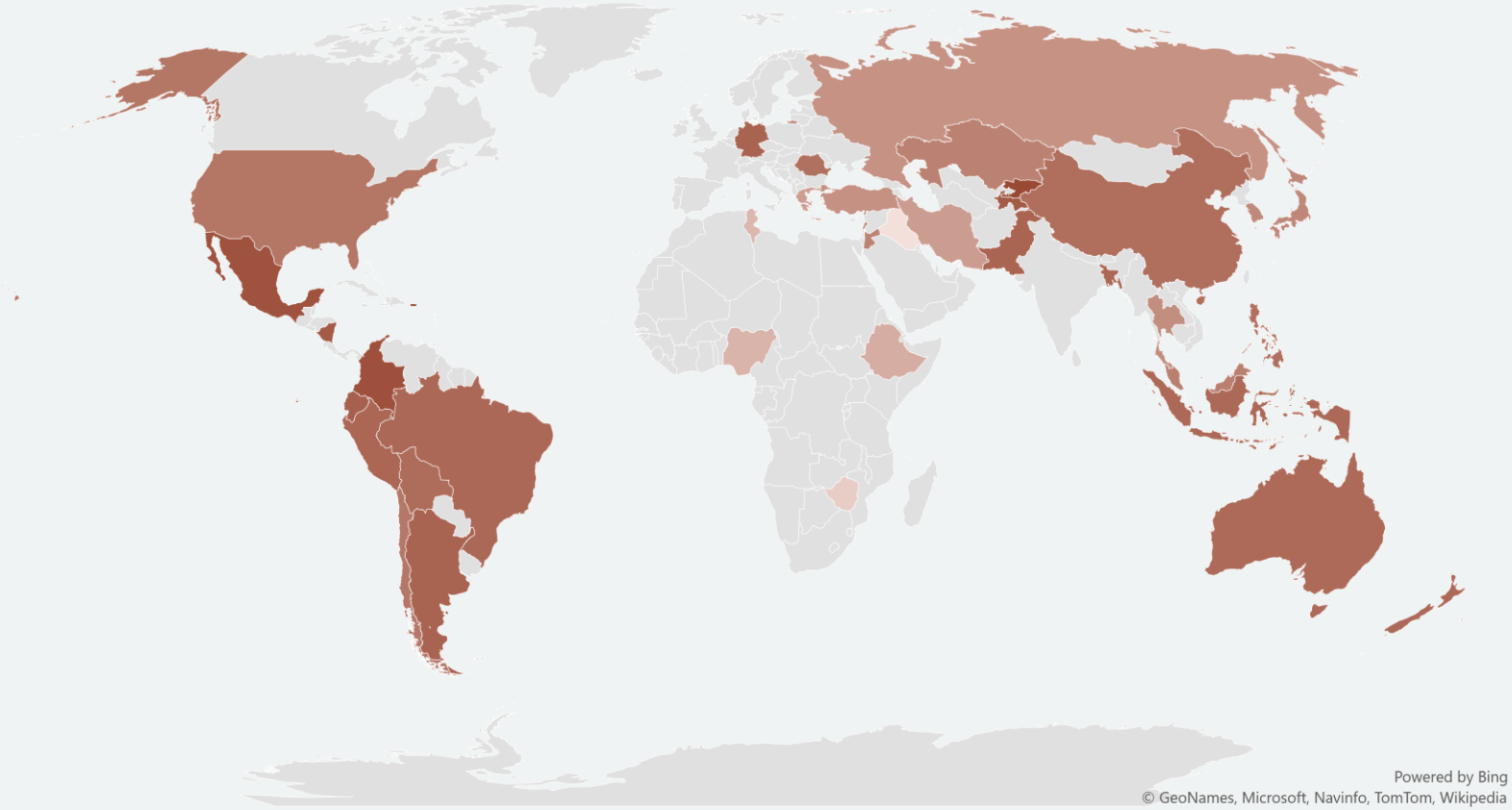
1) percentage of the population actively using the Internet;
2) percent of the population actively using social media;
3) percent of Mobile users

Digital Report 2020

In 2020 the percentage of mobile phone users exceeds 100% for most of the countries, meaning that on average each person possesses more than one mobile phone.



Life Satisfaction Level across the World, WVS data, 2017-2020



Information channels, daily used by respondents, % within countries, WVS data, 2017 - 2020

	Newspaper	Social media	Talk to friends	TV news	Mobile	Internet
Andorra	57.0	45.9	33.8	60.9	45.3	49.1
Argentina	16.9	45.3	43.5	71.8	52.2	49.0
Australia	29.6	42.9	38.6	66.8	51.9	61.8
Bangladesh	17.3	15.6	28.6	73.3	45.6	12.7
Bolivia	9.3	33.4	32.1	80.4	39.8	32.9
Brazil	23.5	51.0	53.1	68.2	57.3	55.8
Chile	18.2	45.7	40.4	63.7	46.0	47.3
China	6.9	54.3	39.5	55.6	68.6	23.1
Colombia	16.4	55.6	53.0	68.4	66.8	55.7
Ecuador	24.1	55.7	42.9	74.7	55.0	54.6
Ethiopia	3.6	22.0	32.9	42.3	50.7	17.5
Germany	47.9	25.7	38.6	73.0	42.9	51.6
Greece	7.8	38.6	30.5	64.8	30.0	49.4
Hong Kong SAR	34.5	61.2	45.0	71.6	65.8	66.9
Indonesia	12.2	38.7	45.7	77.0	43.5	32.7
Iran	4.3	61.1	29.2	63.1	58.3	53.2
Iraq	6.5	55.0	47.1	51.9	33.2	41.4
Japan	57.5	25.6	25.6	89.8	27.6	60.6
Jordan	5.7	53.3	37.4	45.6	32.9	37.3
Kazakhstan	10.5	35.2	37.3	64.2	49.1	44.7
Kyrgyzstan	4.1	49.9	50.5	67.7	62.4	60.4
Lebanon	3.8	55.3	55.8	58.6	34.4	35.3
Malaysia	35.3	70.1	52.3	57.6	73.3	73.3
Mexico	17.8	31.6	22.9	59.5	35.7	29.9
New Zealand	38.8	43.3	46.9	67.3	56.9	65.4
Nicaragua	5.8	37.4	27.4	52.2	41.1	37.8
Nigeria	14.1	32.8	63.3	41.6	59.4	29.9
Pakistan	13.3	13.0	25.9	51.2	25.2	12.1
Peru	36.5	37.0	34.3	77.0	39.7	33.6
Philippines	17.8	35.3	35.5	82.2	42.6	25.5
Puerto Rico	34.7	58.3	47.3	65.5	66.6	61.3
Romania	12.1	33.0	34.6	73.7	42.9	34.8
Russia	11.5	18.7	26.4	64.0	12.4	28.9
South Korea	12.5	15.7	38.3	79.9	68.4	55.1
Taiwan ROC	19.4	47.0	13.7	67.9	53.7	59.9
Tajikistan	10.8	17.0	26.4	60.9	36.2	24.4
Thailand	21.9	47.4	45.9	73.7	49.5	42.1
Tunisia	9.6	50.1	50.7	67.9	38.7	35.7
Turkey	24.7	65.0	43.0	78.6	68.8	65.1
United States of America	21.4	50.1	38.6	49.9	56.6	69.8
Zimbabwe	6.5	24.2	50.2	24.9	55.0	15.7

Source: Authors' calculations based on the WVS data, 2020

Findings from Gallup World Poll

Consistent stable significant positive association between current life satisfaction and individual Internet access

Perceptions of uncertainty indeed predict life evaluations. If people declared that their standards of living became worse during last year, they tend to score less on the happiness ladder.

Percentage of Internet users at the country level contributes to life satisfaction meaning that in countries with high Internet penetration people tend to evaluate their lives higher on the ladder.

Internet, uncertainty and life satisfaction

Individual access to the internet might decrease the impact of the perception of the current labor market instability on life satisfaction evaluations.

Better opportunities to obtain information on the labor market could decrease the positive association with life satisfaction.

A little less happy could be those non-active people who have mobile phones.

Internet and life satisfaction

In countries with higher percentages of Internet users the positive association between individual Internet access and life satisfaction sparkles.

While the higher percentage of mobile phone users in the countries decreases the positive impact of individual internet access on life satisfaction.

The explanation: internet access via mobile phone (like 24 hours availability on the Internet) erases the boundaries between work and family life and that might shorten the life satisfaction scores.

Internet access, in general, contributes to higher life evaluation scores

Findings from WVS on the usage of Internet and SM and happiness

The social media coverage **does significantly affect** the individual SWB in the countries.

The higher mobile phone usage in the country is associated with a **negative** impact on SWB via easier access to **emails**.

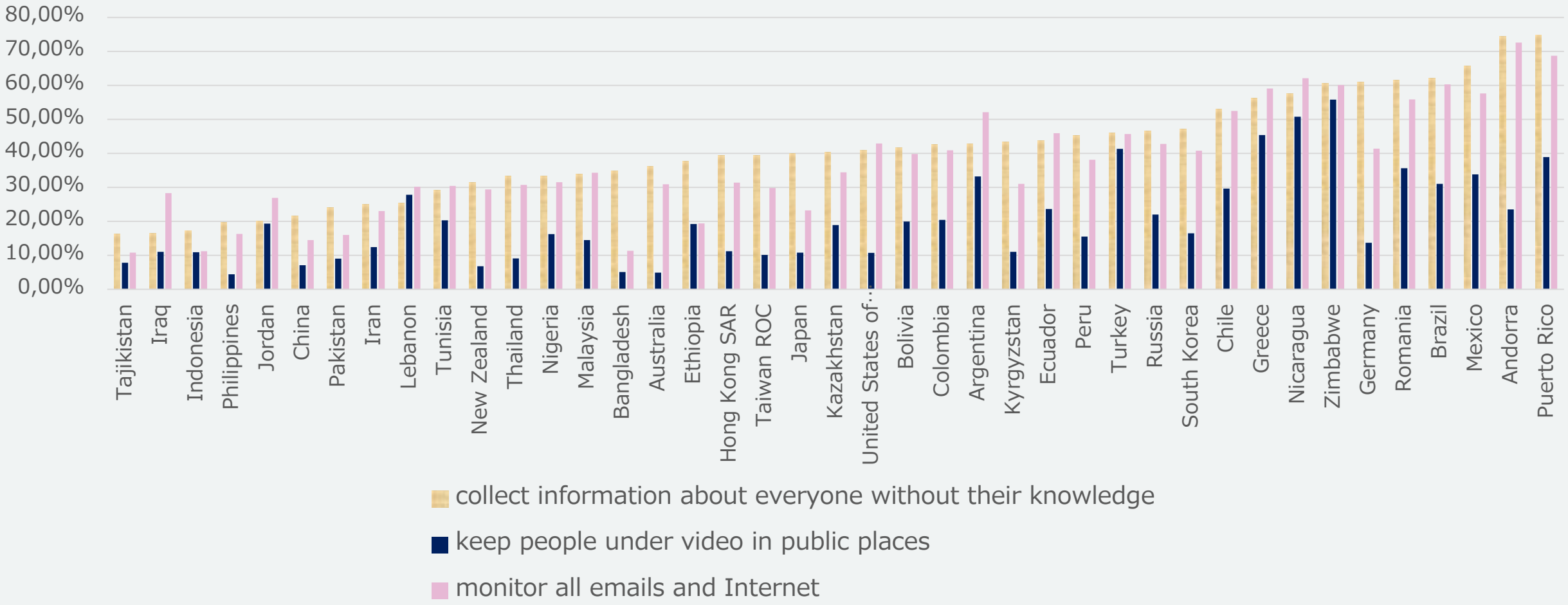
In countries with a high rate of mobile phone usage, there is a **positive** impact of using the **Internet** on individual life satisfaction.

Happiness sustainability???

Will happiness and life satisfaction be sustainable under a further expansion of digitization in our life?

Are there any challenges regarding public opinion on digitalization?

WVS (2017-2020): Percentage of those who said that the government should NOT have the right to



Thank you for your attention