Global Expansion of Cryptocurrencies:

The Effect of Digital Readiness of Economies

Abstract

Since the invention of bitcoin shortly after 2008 financial crisis, cryptocurrency markets have increasingly become the center of attention in global economy. While the data suggests that cryptocurrency markets are expanding around the world, few studies explore why different countries own different shares of this rapidly expanding global market. Drawing on insights from the resource-based view and information economics perspective, this paper examines the effect of the digital readiness of an economy, as an emerging topic, on the expansion of cryptocurrencies in different countries. We argue that having a more digitally advanced economy positively influences the acceptance and adoption of a cryptocurrencies in a country. Using a sample of 128 country observations in 2020, we find support for our theory. We empirically test the link between home country digital readiness and the success of cryptocurrencies expansion into that country. This study contributes to international information technology management literature as well as international fintech literature and enhances our knowledge of comparative research on global adoption of cryptocurrencies.

Keywords

Cryptocurrency, Digital Economy, Crypto Adoption, Policy, Fintech.

1 INTRODUCTION

The increasing importance of cryptocurrencies in the twenty-first century is a reality that can be easily observed in numbers. Particularly, the pace of expansion of cryptocurrencies around the world in different economies has become a focus in financial markets. However, there are many underexplored areas in this field that still need to be studied. One important underexplored area is factors influencing global expansion of cryptocurrencies. Cryptocurrency as an innovation, that was introduced shortly after 2008 financial crisis, focuses on facilitating the financial transactions and aims to help the high growth for economies and protecting the overall wealth of society by being an alternative to fiat money. Cryptocurrency technology is expected to help citizens and firms around the world, so they be able to expand their transactions across borders and compete in global markets. Given the benefits that cryptocurrencies have for economic development and national prosperity, governments and public agencies have realized the importance of providing the necessary infrastructures to support and encourage this useful type of financial technology.

As of now there are hundreds of new cryptocurrencies being traded in the market however, a few of them such as Bitcoin or Ethereum dominate majority of the market capitalization. The Bitcoin market operates via a peer-to-peer network, called Blockchain, that allows online trading and payments to be made without the interference of a central system such as central banks. Among the cryptocurrencies, Bitcoin is the most popular cryptocurrency when it comes to trading and usage, and Ethereum is the second important cryptocurrency market. Cryptocurrencies have become an emerging area of study for academics and researchers as well as investors for several reasons. They are considered to be useful for risk management (Selmi, Mensi, Hammoudeh, and Bouoiyour, 2018) as well as showing a good history of prediction of large and frequent shocks to the market (Dyhrberg, 2016a, Dyhrberg, 2016b). In addition to that, some studies such as the one done by Urquhart (2016) shows that Bitcoin can play a positive role in enhancing the market efficiency. Moreover, there other studies that show the existence of long memory in the price dynamics of the Bitcoin market (Jiang, Nie, and Ruan,

2018; Tiwari, Jana, Das, and Roubaud, 2018).

Despite the key role of national context in preparing the environment for cryptocurrencies, the reason why some countries are more advanced in creating that environment is not well-understood neither in the international IT management nor in the international fintech literature. As a result of this gap along with the call for more research on the role of home country institutions in crypto market and more detailed research on the impact of digitalization of economy in general, we examine the following research question: *"Does digital readiness of an economy influence the global crypto adoption?"*. Given the importance of crypto markets for economies (Subramaniam and Chakraborty 2020) and growing attention to the digitalization of economies (Afonasova et al., 2019), the intersection of these two topics can be of interest to scholars of both international fintech and international information technology management fields.

Advances in information technology and the digital economy are expected to lead to higher economic prosperity in most countries (Brynjolfsson and McAfee, 2012). However, the results of this rising driving force of the economy are unexplored. We build upon Resource-Based View (RBV) and Information Economics (IE) and argue that digitalization boosts the global crypto adoption. Digital readiness turns into a necessary competitive resource that influences the success of crypto markets. It facilitates spread of information and provides a more advanced infrastructure to promote cryptocurrency activities. Moreover, digitalization improves information availability, provides average citizens and market participants with more complete information (Allen, 1990; Stigler, 1961) and creates a better interaction between the supply and demand side of cryptocurrencies.

This study has several contributions. This is the first study that explores the effect of digitalization on global expansion and adoption of cryptocurrencies. This comparative study contributes to the ongoing debate about the role of the policymaking and advances the literature of global fintech by identifying how the increasing role of information technology has turned digital readiness to an important factor for global crypto adoption. It also extends the institutional perspectives literature by focusing on a relatively novel aspect (i.e., digital

readiness of economies). Moreover, this study augments our knowledge of international fintech by providing insight into the cross-national differences in crypto markets.

2 | THEORY AND HYPOTHESES

Rising interest in crypto markets (Subramaniam and Chakraborty 2020) highlights the need for comparative studies to investigate the conditions that encourage global crypto adoption. The cryptocurrency market has achieved widespread attention since the introduction of Bitcoins in 2008 (Nakamoto 2008). The number of altcoins has surged from a single cryptocurrency in July 2010 to more than 2500 cryptocurrencies in early 2020. As figure 1 shows the market value of cryptocurrencies has increased from what it used to be (a $1 billion in 2013) to more than $1 trillion in 2021 (Coinmarketcap global charts, 2021). One feature that distinguishes this new emerging market is the fact that the cryptocurrency market is decentralized and unregulated, which is the exact opposite of fiat currencies. Yet, cryptocurrencies are relatively young, highly volatile, and considered to be a highly risky asset class.

[Insert Figure 1 about here]

Meanwhile, in recent years, digitalization has unleashed surging waves of fast changes through economies across the world (Maiti and Kayal, 2017). Emerging economies such as China and India are also pushing themselves to go through these changes to help rebuild their economies (e.g., Chaudhuri and Kumar, 2015). In this paper, we add to this stream of research by arguing that as communication and information flows are becoming more critical for economies, market participants will be more influenced by the sophistication of digital readiness. We examine the direct influence of digital readiness of an economy on global crypto adoption. Figure 2 shows the conceptual model of our study.

2.1 | **Digital Readiness**

Digitalization as a form of institutional arrangement has received significant interest in recent years (Afonasova et al., 2019). In the current state of the global economy, there are tremendous waves of technology and digitalization that are already not only changing the way we do business but also changing our lifestyle. The capability of an economy to exploit digital opportunities referred to as digitalization of economies (Rachinger et al., 2019) has turned into a disruptive force that is significantly shifting the tone in many sectors and industries such as media, transportation, and banking. (OECD, 2015; World Bank, 2016). Several parts of the global economy are under the influence of advances made in information and communications technologies (ICTs) (Tapscott, 1997). According to the World Economic Forum (WEF) forecast, 60 percent of the global economy will be digitized by the year 2022. The advances in information technology and the digital economy are expected to ultimately lead to higher economic prosperity in most countries (Brynjolfsson and McAfee, 2012), which necessities studying the effect of this rising driving force of the twenty-first century economy on cryptocurrency adoption.

It is widely accepted that internet and communication technologies play a critical role in the livelihood of an economy (Bruno et al., 2010; Cruz- Jesus et al., 2012; Figueres-Olsen and Paua, 2003; Milenkovic et al., 2016; Sarkar, 2012). Many scholars in the literature have studied the effect of ICT on macro-environmental factors such as growth rate of the economy and socio-economy (Cardona et al., 2013; Dodgson et al., 2011; Dimelis and Papaioannou, 2011; Hobday et al., 2012; Patanakul and Pinto, 2014). Moreover, as digitalization is becoming increasingly more influential in economies and their competitiveness some metrics have been developed to measure the digital readiness of an economy. One of the most comprehensive metrics was developed by WEF in early 2000s. Their digital readiness construct, which was later continued by *Portulans Institute,* includes four major dimensions as follow: a) technology b) people c) governance and d) the overall impact of ICT on economy and society.

2.2 | **Digital Readiness and global expansion of cryptocurrencies**

Global crypto adoption is the extent to which resident of a country have moved the

biggest share of their financial activities to cryptocurrencies. We argue that the degree that a nation is ready and equipped for digitalization may impact the cryptocurrency adoption in that nation. Digital readiness can improve the process of exchange between the creator and the receiver of crypto currency as well as subsequent transactions that can happen later in order to use the cryptocurrencies for other purchases. In fact, digital readiness is at the core of this process. Therefore, diffusion of a cryptocurrency depends on the ability of both the creator to sell it to the market (supply side) and the receiver to adopt the cryptocurrency for his/her daily life. Digitalization can contribute to both sides and eases the interaction between the agents. There are two major reasons why digital readiness is an effective facilitating vehicle when it comes to the global crypto adoption.

First, from the supply side digitalization not only facilitates the creation of new cryptocurrency and provides a more advanced infrastructure and technical assistance to improve crypto promotion, but also helps the creator of cryptocurrency produce more digitally relevant platforms. The digital economy is becoming increasingly a bigger part of the economy. According to a WEF report more than half of the world economy will be digitized by the year 2022 (WEF, 2018). This means that more than half of the products and services created or exchanged in economy will be tied to the digital economy. According to the resource-based view, success and failure of firms depend on their access to resources (Barney, 1991). In the current digitally surrounded environment having access to more digitally relevant resources can lead to more innovative crypto products, which will turn into a necessary competitive resource that will influence the crypto adoption in a country. Firms such as Google, Amazon, Microsoft, and UBER are just a few examples that remind us how giant companies are extensively tied to the digital world. According to Bloomberg data, in 2020, seven out of the top 10 publicly traded companies in the world with the largest market capitalization were high-tech companies such as Apple and Microsoft. In such an intensely high-tech and digitally tied economy, cryptocurrency creators not only need to have access to better laws, regulation and government support for digital products and services, but also need to have access to better digital infrastructure, and a higher rate of penetration for the usage of internet, digital devices, and digital products. A suitable infrastructure can help them to provide more digitally tied ideas and complementary

products.

Second, from the demand side, digitalization results in more requests for using cryptocurrencies for daily lives. Digitalization enhances information availability and the facilities that must be provided for cryptocurrency users to let them have more complete information about the ways they can be applied toward commercial ends. According to information economics, originally inspired by Hayek (1945), information and information systems affect economic decisions. Information can impact strategies in significant ways (Etemad, 2019). Individuals are more likely to assess opportunities positively when the cost of getting information is low. Imperfect information creates uncertainty and barriers on the demand side. In another word, awareness of new technology and lower levels of uncertainty are found to be influential in the demand for technology transfer (Caiazza, 2016; Geroski, 1990). In an economy with better digital readiness due to less information asymmetry (as a result of better infrastructure and usage of internet and ICT) (Reddy and Reinartz, 2017), crypto adopters will have better access to complementary platforms in which they can utilize their crypto assets. To have a better rate of crypto adoption the users should be provided with better ICT facilities to gain access to more complete information and to suffer less from information asymmetry. This good access can be gained through better availability of the internet, and more comprehensive online and connected systems to keep the crypto adopters tuned with new crypto innovations.

The influence of digitalization on both supply and demand sides and easing the interaction between these sides account for the facilitating effect of digitalization on crypto adotion. Thus, we propose:

Hypothesis (H1) *There is a positive relationship between the digital readiness of an economy and global cryptocurrency adoption.*

H1a) *There is a positive relationship between the technology component of digital readiness of an economy and global cryptocurrency adoption.*
H1b) *There is a positive relationship between the people component of digital readiness of an economy and global cryptocurrency adoption.*

H1c) *There is a positive relationship between the governance component of digital readiness of an economy and global cryptocurrency adoption.*

H1d) *There is a positive relationship between the impact component of digital readiness of an economy and global cryptocurrency adoption.*

3 | DATA AND METHODS

We examine the global crypto adoption index for about 128 countries in 2020. The data for global crypto adoption index is collected from an annual report named "Geography of Cryptocurrency Report", which is a widely used dataset created by "Chainanalysis", a blockchain tracking firm, and provides a preliminary, but strong, indication that different factors influence global expansion of cryptocurrencies. We obtained other variables from *the World Bank*, *Portulans Institute*, and *Hofstede Insights*, as they are commonly used databases in the literature of international business and information technology management. Our datasets provide country-level data for digital readiness of economies and the extent to which the cryptocurrencies are being expanded globally.

3.1 | Dependent variable

We used one dependent variable to test our hypotheses. To capture the extent to which the cryptocurrencies are being expanded globally, we used "*The 2020 Geography of Cryptocurrency report"*, from the Chainanalysis dataset. According to the definition provided by Chainanalysis, *Global Crypto Adoption* is the extent to which cryptocurrencies are used by both individuals and firms in different countries and it's a continuous variable that varies between 0 and 1. Global crypto adoption index is composed of four metrics as follow:

The underlying concepts behind global crypto adoption index

On-chain cryptocurrency value received, weighted by purchasing power parity (PPP) per capita.

A –

B – On-chain retail value transferred, weighted by (PPP) per capita.

C – Number of on-chain cryptocurrency deposits, weighted by number of internet users.

D – Peer to peer (P2P) exchange trade volume, weighted by (PPP) per capita and number of internet users.

3.2 | Independent variables

We used Digital Readiness as the independent variable in this study to test our hypotheses. Digital Readiness provides a comprehensive measure of the level of digitalization in an economy (Please see Appendix A for a detailed explanation). It was measured using four sub-indexes, with 10 pillars and 54 individual indicators (Bilbao-Osorio et al., 2013). As a weighting procedure the arithmetic mean was used to calculate pillars and sub-indexes and the digital readiness score as well (Bashir, 2013; Bilbao-Osorio et al., 2013). We used this variable to test Hypothesis 1.

Moreover, to make sure about the validity and solidness of our results for hypothesis 1 we tested the model separately with each of the sub-indexes of digital readiness which are as follow (*H1a: Technology sub-index, H1b: People sub-index, H1c: Governance sub-index, H1d: Impact sub-index).*

We collected the above data from the Portulans Institute which after 2018 took the responsibility of forming this database. Before that it was World Economic Forum who was in charge of generating the annual report every year.

3.3 | Control variables

For control variables, we tried to predict the factors that might impact the global crypto adoption. These controls include some economic and cultural attributes of countries, as well as the calendar year fixed effects.

To control for country effects, we included seven variables. We control for a country's size and individual wealth using gross domestic product (GDP), GDP per capita, and GDP growth as environmental variables that are indicators of the local economic conditions of the

nations in which the policy is implemented (Munari et al., 2016). We obtained this data from the World Bank database. GDP and GDP per capita both could be proxies for the financial development of a country. In some studies, market growth is seen as an indicator of market attractiveness, which is expected to lead to enhanced resource commitment in a country (e.g., Brouthers, 2002; Chang and Rosenzweig, 2001). One of the factors that could explain trends in the economic health of a country, and becomes specifically relevant in developing and underdeveloped countries, is inflation rate (negative or positive). This variable can indicate economic optimism that might affect the behavior of firms and individuals in the society. Therefore, we record the historical inflation rate in 2019.

Last but not least, we won't forget the critical role of culture on economic activities including openness to a new type of investment such as cryptocurrencies (Hayton et al., 2002; Freytag and Thurik 2007; Ma and Todorovic 2012). To control for cultural factors, we use Hofstede's measures (1980, 2010) extracted from Hofstede Insights database and based on the four orthogonal dimensions including individualism, uncertainty avoidance index, power distance index, and masculinity.

[Insert Figure 3 about here]

3.4 | Methods

In this study, we test our model using global crypto adoption index as a continuous dependent variable. As it's a single year observation we used multivariate regression for analysis.

4 | RESULTS

4.1 | Descriptive statistics

Table 1 illustrates descriptive statistics and correlations. As shown in the table the global

crypto adoption score for 2020 for different countries varies from 0 to 1 and the mean is 0.13. In 2020 the best global crypto adoption score belongs to Ukraine with 1 out of 1 score and then to Russia with 0.931. United States with the score of 0.627 is ranked number 6 as one of the countries with highest score for global crypto adoption. The mean score for digital readiness for countries in the sample period for 2020 is 49.49 while the score varies from 14.8 to 82.75. Fig. 3 shows the top 10 countries with the highest overall digital readiness scores in 2020 (Sweden, Denmark, Singapore, Netherlands, Switzerland, Finland, Norway, US, Germany, UK).

[Insert Table 1 about here]

Table 1 represents descriptive statistics and correlations for the full dataset used in our analysis. As Table 1 shows, some of the independent and/or control variables are highly correlated. Many of these correlations were to be expected. For instance, Digital Readiness scores are linked to Digital Readiness sub-indexes. Similarly, it is expected that countries with higher GDP and GDP per capita have more resources to invest in their infrastructures and have higher digital readiness scores. Interestingly, GDP per capita, and digital readiness score are highly correlated. To ensure that multicollinearity was not a concern, we ran the collinearity diagnostics and reviewed the variance inflation factor (VIF) scores for our main model. The highest VIF score was between the Digital Readiness Technology sub-index and GDP per capita (4.022). In general, VIF scores below 10 are not considered problematic for multicollinearity (Cohen et al., 2003: 423).

4.2 | Main results

Table 2 presents the results of our tests of the effect of the Digital Readiness Index (and its sub-indexes) on the global crypto adoption. While model 1 only includes the control variables, Models 2, 3, 4, and 5 introduce the effect of four major digital readiness sub-indexes and test them respectively. The coefficient of each sub-index in each one of these models is strongly significant, suggesting that Technology component of the digital economy, human capital of digital economy, governance of digital economy, and finally the ultimate impact of ICT

on society and economy of a country as the 4 sub-indexes that build up digital readiness construct do affect the global crypto adoption. We also find strong overall support for H1 by obtaining a significant coefficient for overall digital readiness score in model 6, showing that overall digital readiness score also does have a positive influence on the global crypto adoption.

[Insert Table 2 about here]

5 | DISCUSSION

This study emphasizes on the importance of digital readiness of economies in determining the success of countries for global crypto adoption. This is one of the first studies to bring the concept of digital readiness to the global crypto markets. While we do not directly hypothesize about the impact of other external factors on global crypto adoption (such as the size of the economy or market growth), we include them as controls in our models.

According to a review of international business and institutional perspectives literature and by a concurrent investigation into supply and demand sides, we built a hypothesis about the effect of digital readiness on the global crypto adoption and argued why this effect might exist and be substantial. Results support this main hypothesis and confirm a relationship for each sub-index of digital readiness as well. This finding suggests that digital readiness is a significant factor affecting the global crypto adoption, which gives more power to cryptocurrency market participants to not only succeed domestically but also be able to expand globally. Our data provide support that all sub-indexes of the digital economy including technology, the people, governance, and impact, are associated with the global crypto adoption.

5.1 | Policy and Practical Contribution

The rise of interest in the cryptocurrency markets have been vast in recent years. The potential benefits and possible harms of global expansion of cryptocurrencies have sparked political interest in the matter, leading political players to develop policies to promote or discourage this financial technology. According to the Porter Diamond Theory of National Advantage, governments can operate as catalysts to enhance a country's competitive advantage in the global environment. Our findings provide insights for policymakers and suggest that digital readiness can improve the country's position in the global crypto era if they see it as an opportunity. Likewise, given the importance of cryptocurrencies particularly during inflation periods, it is important to examine the mechanisms empowering local market participants to gain a competitive advantage in global competition. Better-developed home country institutions have a supportive impact on the country's crypto adoption.

Our global comparative study suggests that countries with higher digital readiness are more able to global crypto adoption and benefit from owning a larger share in this rapidly expanding market. Our findings have clear implications for international crypto markets. Given the significant differences among countries in terms of digitalization (Afonasova et al., 2019), it is important to inform market participants of how digitalization plays a central role in cryptocurrency activities for a better comparison of countries.

6 | LIMITATIONS AND FUTURE RESEARCH

We acknowledge that there are some limitations to our study. First, using a secondary database (i.e., Chainanalysis database), and the impossibility of gathering more complete data, we exclude some other aspects of cryptocurrency expansion from our analysis. Although Chainanalysis report has been widely used to address cryptocurrency research questions especially on cross-national levels in the literature, this limitation can reduce the generalizability of our results. Moreover, we are not able to probe into the process of global crypto adoption. This field would benefit from qualitative studies and fine-grained research that examine the detailed how of digitalization influence on global crypto adoption. For example, future research

can investigate the speed or effectiveness of global crypto adoption. Second, the relative novelty of the digital readiness concept in the literature makes it difficult to control for the variables that might impact the link. We include a few control variables that we obtained either from the literature or rational thinking about the concept of global crypto adoption. Future studies can examine more potential variables that might account for the global crypto adoption to decrease the concern that other variables influence this relationship.

Finally, while there are many reasons behind interest in studying the global crypto adoption and the factors influencing them, one potential direction for future research is investigating the alternative resources that cryptocurrency market participants might find to improve their competitive position for global expansion. Overall, we trust that this untouched corner of the field of global crypto will soon be filled with high-quality studies from highly talented scholars.

7 | CONCLUSION

Despite these limitations, our findings contribute to a global investigation of cryptocurrency development and explain the cross-national variation of crypto adoption, which is underexplored in the literature. This is the first study to examine the effect of digital readiness on global crypto adoption and provides new grounds of research. In this paper digital readiness is introduced as an emerging construct that can provide numerous opportunities for cryptocurrency studies. Moreover, we introduced and tested the four dimensions of digital readiness — technology, people, governance, and impact — that each one of them could potentially play an important role to enhance our understanding of global crypto adoption in the era of digitalization.

The subject of this study and what we found, as a result of our investigation, indicate the tremendous potential that exists in the digital aspect of crypto environment. Government officials and policymakers have started to realize the importance of investment in the digital economy for economic prosperity and social improvements (Bruno et al., 2010; Cardona et al., 2013; Hobday et al., 2012; Patanakul and Pinto, 2014; Sarkar, 2012). Meanwhile, in today's

world ignoring the importance of the digital economy can lead to significant economic disadvantage (Chang et al., 2016). Therefore, understanding the mechanisms through which the digital economy and its interaction with environmental factors affect cryptocurrencies provides a good insight to policymakers to improve their social and economic decisions regarding crypto adoption. We trust that our findings contribute to more informed policy making and advance international fintech literature.

REFERENCES

Afonasova, M. A., Panfilova, E. E., Galichkina, M. A., & Ślusarczyk, B. (2019). Digitalization in economy and innovation: the effect on social and economic processes. *Polish Journal of Management Studies*, *19*.

Aldrich, H. (2008). *Organizations and environments*. Stanford University Press.

Allen, B. (1990). Information as an economic commodity. *The American Economic Review*, *80*(2), 268.

Amezcua, A. S., Grimes, M. G., Bradley, S. W., & Wiklund, J. (2013). Organizational sponsorship and founding environments: a contingency view on the survival of business-incubated firms, 1994–2007. *Academy of Management Journal*, *56*(6), 1628-1654.

Amighini, A., Rabellotti, R., & Sanfilippo, M. (2013). China's outward FDI: An industry-level analysis of host-country determinants. *Frontiers of Economics in China*, *8*(3), 309-336.

Audretsch, D. B., Baumol, W. J., & Burke, A. E. (2001). Competition policy in dynamic markets. *International journal of industrial organization*, *19*(5), 613-634.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.

Bashir, M. (2013). Networked Readiness Index (NRI) 2013 rankings for developing countries of Asia and evaluation of NRI indicators rankings of Pakistan. *International Journal of Advanced*

Research, 1(10), 530-538.

Baumol, W. J., Litan, R. E., & Schramm, C. J. (2007). *Good capitalism, bad capitalism, and the economics of growth and prosperity*. Yale University Press.

Bilbao-Osorio, B., Dutta, S., & Lanvin, B. (2013, April). *The global information technology report 2013*. In World Economic Forum (pp. 1-383).

Bloom, N., Schankerman, M., & Van Reenen, J. (2013). Identifying technology spillovers and product market rivalry. *Econometrica*, *81*(4), 1347-1393.

Brouthers, K. D. (2002). Institutional, cultural and transaction cost influences on entry mode choice and performance. *Journal of International Business Studies*, 33(2), 203-221.

Brouthers, K. D., Brouthers, L. E., & Werner, S. (2008). Real options, international entry mode choice and performance. *Journal of Management Studies*, 45(5), 936-960.

Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. (2012). The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, *32*(2), 110-121.

Bruno, G., Esposito, E., Genovese, A., & Gwebu, K. L. (2010). A critical analysis of current indexes for digital divide measurement. *The Information Society*, 27(1), 16-28.

Brynjolfsson, E., & McAfee, A. (2012). Race against the machine: How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy.

Caiazza, R. (2016). A cross-national analysis of policies affecting innovation diffusion. *The Journal of Technology Transfer*, *41*(6), 1406-1419.

Cardona, M., Kretschmer, T., & Strobel, T. (2013). ICT and productivity: conclusions from the empirical literature. *Information Economics and Policy*, 25(3), 109-125.

Chang, S. J., & Rosenzweig, P. M. (2001). The choice of entry mode in sequential foreign direct investment. *Strategic Management Journal*, 22(8), 747-776.

Chang, Y., Wong, S. F., & Park, M. C. (2016). A three-tier ICT access model for intention to participate online: a comparison of developed and developing countries. *Information Development*, 32(3), 226-242.

Chaudhuri, P., & Kumar, A. (2015). Role of digitization and e-commerce in indian economic growth: an employment generation perspective. *Research Gate. December*.

Chen, J., Saarenketo, S., & Puumalainen, K. (2018). Home country institutions, social value orientation, and the internationalization of ventures. *International Business Review*, *27*(2), 443-454.

Chi, L., Ravichandran, T., & Andrevski, G. (2010). Information technology, network structure, and competitive action. *Information Systems Research*, 21(3), 543-570.

Coeurderoy, R., & Murray, G. (2014). Regulatory environments and the location decision: Evidence from the early foreign market entries of new-technology-based firms. *Location of International Business Activities* (pp. 226-260). Palgrave Macmillan, London.

Cohen, J., Cohen, P., & West, S. G. (6). Aiken, l. S.(2003). *Applied multiples regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Cruz-Jesus, F., Oliveira, T., & Bacao, F. (2012). Digital divide across the European Union. *Information & Management*, 49(6), 278-291.

Cumming, D., Schmidt, D., & Walz, U. (2010). Legality and venture capital governance around the world. *Journal of Business Venturing*, *25*(1), 54-72.

Dee, N. J., Livesey, F., Gill, D., & Minshall, T. (2011). Incubation for Growth. *Research summary*.

Dimelis, S. P., & Papaioannou, S. K. (2011). ICT growth effects at the industry level: A comparison between the US and the EU. *Information Economics and Policy*, 23(1), 37-50.

Dodgson, M., Hughes, A., Foster, J., & Metcalfe, S. (2011). Systems thinking, market failure, and the development of innovation policy: The case of Australia. *Research Policy*, 40(9), 1145-1156.

Dutta S, Bilbao-Osorio B and Geiger T (2012) *The Networked Readiness Index 2012: Benchmarking ICT progress and impacts for the next decade. Global Information Technology*

Report 2012 pp 3–34. World Economic Forum.

Dyhrberg, A. H. (2016a). Bitcoin, gold and the dollar–A GARCH volatility analysis. *Finance Research Letters*, *16*, 85-92.

Dyhrberg, A. H. (2016b). Hedging capabilities of bitcoin. Is it the virtual gold?. *Finance Research Letters*, *16*, 139-144.

Etro, F. (2007). *Competition, innovation, and antitrust: a theory of market leaders and its policy implications*. Springer Science & Business Media.

Figueres-Olsen, J. M., & Paua, F. (2002). Crafting the environment for networked readiness. *Global Information Technology Report*, 2003, 26-43.

Geroski, P. A. (1990). Procurement policy as a tool of industrial policy. *International review of applied economics*, *4*(2), 182-198.

Hall, B. H., Mairesse, J., & Mohnen, P. (2010). Measuring the Returns to R&D. In *Handbook of the Economics of Innovation* (Vol. 2, pp. 1033-1082). North-Holland.

Hayek, F. A. (1945). The use of knowledge in society. *The American economic review*, *35*(4), 519-530.

Hobday, M., Boddington, A., & Grantham, A. (2012). Policies for design and policies for innovation: Contrasting perspectives and remaining challenges. *Technovation*, 32(5), 272-281.

IMF, (2018). The long and short of the digital. Retrieved from https://www.imf.org/external/pubs/ft/fandd/2018/06/impact-of-digital-technology-on-economic-growth/muhleisen.pdf

Jiang, Y., Nie, H., & Ruan, W. (2018). Time-varying long-term memory in Bitcoin market. *Finance Research Letters*, *25*, 280-284.

Jourdan, J., & Kivleniece, I. (2014). Too much of a good thing? The dual effect of public sponsorship on firm performance. In *Academy of Management Proceedings* (Vol. 2014, No. 1, p.

16080). Briarcliff Manor, NY 10510: Academy of Management.

Jourdan, J., & Kivleniece, I. (2017). Too much of a good thing? The dual effect of public sponsorship on organizational performance. *Academy of Management Journal*, *60*(1), 55-77.

Keen, C., & Etemad, H. (2012). Rapid growth and rapid internationalization: the case of smaller enterprises from Canada. *Management decision*.

Kuusisto, M. (2017). Organizational effects of digitalization: A literature review. *International journal of organization theory and behavior*, *20*(03), 341-362.

Loebbecke, C., & Picot, A. (2015). Reflections on societal and business model transformation arising from digitization and big data analytics: A research agenda. *The Journal of Strategic Information Systems*, *24*(3), 149-157.

Mahoney, J. T., McGahan, A. M., & Pitelis, C. N. (2009). Perspective—The interdependence of private and public interests. *Organization science*, *20*(6), 1034-1052.

Maiti, M., & Kayal, P. (2017). Digitization: its impact on economic development & trade. *Asian Economic and Financial Review*, *7*(6), 541.

Mason, C., & Brown, R. (2013). Creating good public policy to support high-growth firms. *Small Business Economics*, *40*(2), 211-225.

Milenkovic, M. J., Brajovic, B., Milenkovic, D., Vukmirovic, D., & Jeremic, V. (2016). Beyond the equal-weight framework of the Networked Readiness Index: a multilevel I-distance methodology. *Information Development*, *32*(4), 1120-1136.

Mitchell, R. K., Smith, B., Seawright, K. W., & Morse, E. A. (2000). Cross-cultural cognitions and the venture creation decision. *Academy of management Journal*, *43*(5), 974-993.

Munari, F., Rasmussen, E., Toschi, L., & Villani, E. (2016). Determinants of the university technology transfer policy-mix: A cross-national analysis of gap-funding instruments. *The Journal of Technology Transfer*, *41*(6), 1377-1405.

Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. *Decentralized Business*

Review, 21260.

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.

OECD (2015), "OECD digital economy outlook 2015", available at: www.oecd-ilibrary.org/science-andtechnology/oecd-digital-economy-outlook-2015_9789264232440-en (accessed 26December 2016).

Oviatt, B. M., & McDougall, P. P. (1994). Toward a theory of international new ventures. *Journal of international business studies*, *25*(1), 45-64.

Patanakul, P., & Pinto, J. K. (2014). Examining the roles of government policy on innovation. The *Journal of High Technology Management Research*, 25(2), 97-107.

Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Schirgi, E. (2019). Digitalization and its influence on business model innovation. *Journal of Manufacturing Technology Management*.

Reddy, S. K., & Reinartz, W. (2017). Digital transformation and value creation: Sea change ahead. *Marketing Intelligence Review*, *9*(1), 10-17.

Sarkar, S. (2012). The role of information and communication technology (ICT) in higher education for the 21st century. *Science*, 1(1), 30-41.

Schumpeter, J. A. (1934). The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle (Vol. 55). Piscataway: Transaction Publishers

Schwartz, M. (2009). Beyond incubation: an analysis of firm survival and exit dynamics in the post-graduation period. *The Journal of Technology Transfer*, *34*(4), 403-421.

Selmi, R., Mensi, W., Hammoudeh, S., & Bouoiyour, J. (2018). Is Bitcoin a hedge, a safe haven or a diversifier for oil price movements? A comparison with gold. *Energy Economics*, *74*, 787-801.

Stigler, G. J. (1961). The economics of information. *Journal of Political Economy*, *69*(3), 213-225.

Stinchcombe, A. L. (1965). Organizations and social structure. *Handbook of organizations*, 44(2), 142-193.

Subramaniam, S., & Chakraborty, M. (2020). Investor attention and cryptocurrency returns: Evidence from quantile causality approach. *Journal of Behavioral Finance*, *21*(1), 103-115.

Tapscott, D. (1997), *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*, McGraw-Hill, New York, NY.

Tiwari, A. K., Jana, R. K., Das, D., & Roubaud, D. (2018). Informational efficiency of Bitcoin—An extension. *Economics Letters*, *163*, 106-109.

Tullock, G. (2003). The origin rent-seeking concept. *International Journal of Business and Economics*, *2*(1), 1.

Urquhart, A. (2016). The inefficiency of Bitcoin. *Economics Letters*, *148*, 80-82.

WEF, 2018, World Economic Forum Report Addresses Crisis of Trust, Slowing Growth in Our Digital World. Retrieved from https://www.weforum.org/press/2018/12/world-economic-forum-report-addresses-crisis-of-trust-slowing-growth-in-our-digital-world

World Bank (2016), Digital Dividends: World Development Report 2016, *The World Bank*, Washington, DC.

Wu, W. W., Lan, L. W., & Lee, Y. T. (2012). Exploring the critical pillars and causal relations within the NRI: An innovative approach. *European Journal of Operational Research*, 218(1), 230-238.

Zahra, S. A., & Nielsen, A. P. (2002). Sources of capabilities, integration and technology commercialization. *Strategic Management Journal*, *23*(5), 377-398.

Zucchella, A., & Siano, A. (2014). Internationalization and innovation as resources for SME growth in foreign markets: a focus on textile and clothing firms in the Campania Region. *International Studies of Management & Organization*, *44*(1), 21-41.

Fig. 1. Total Crypto Market Capitalization and Volume in USD

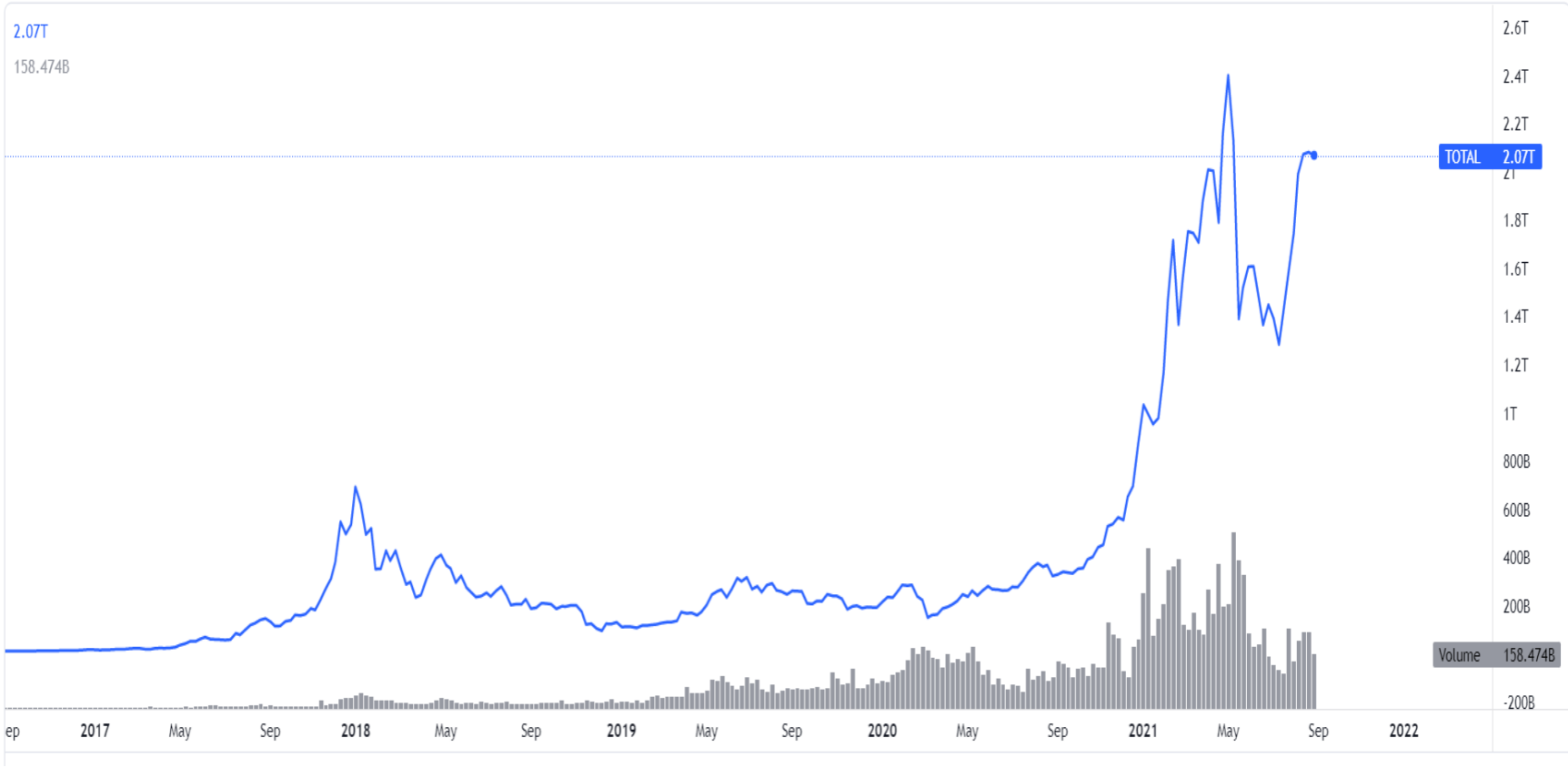

Fig. 2. Theoretical framework

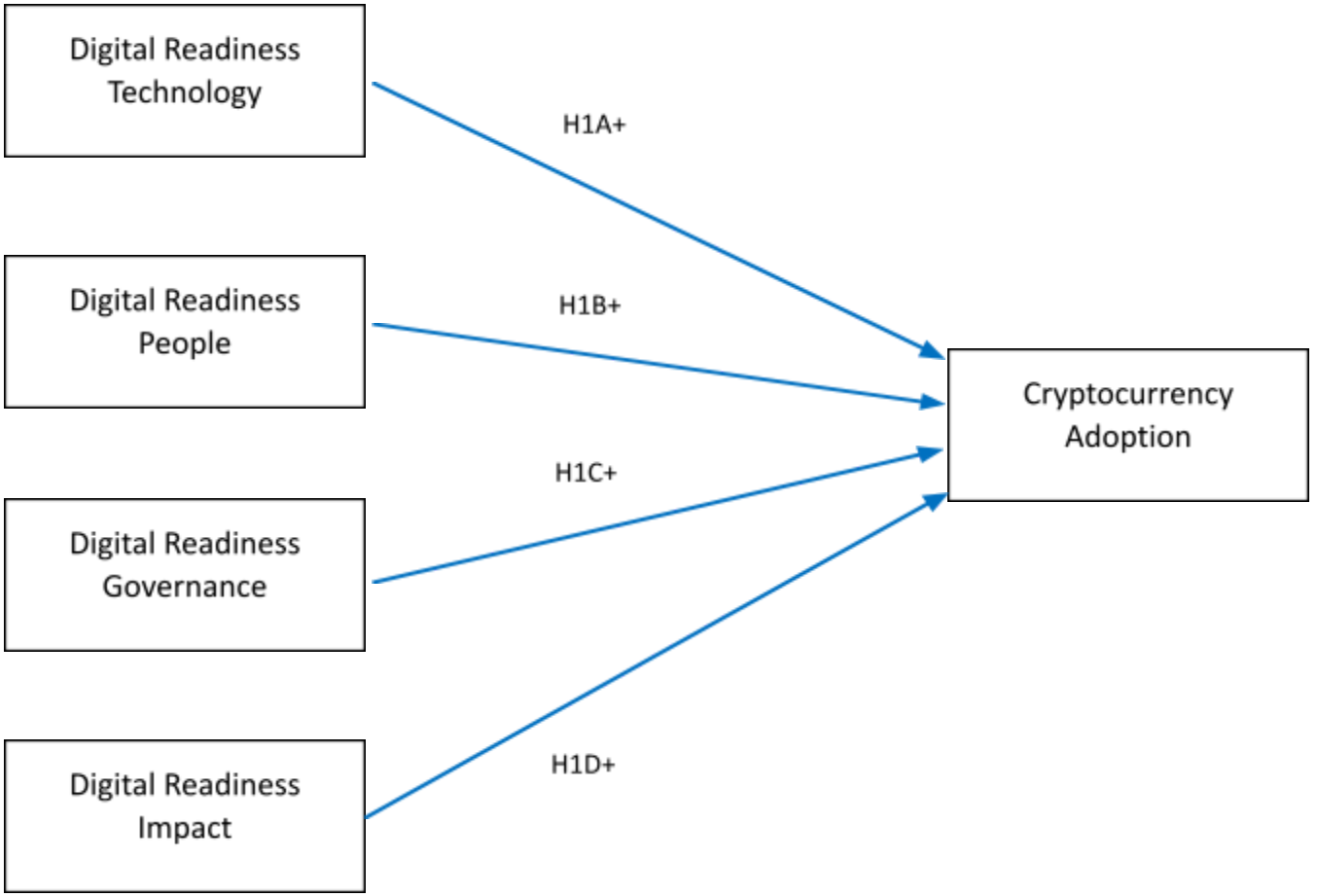

Fig. 2. Top 10 countries with the best Digital Readiness Score in 2020.

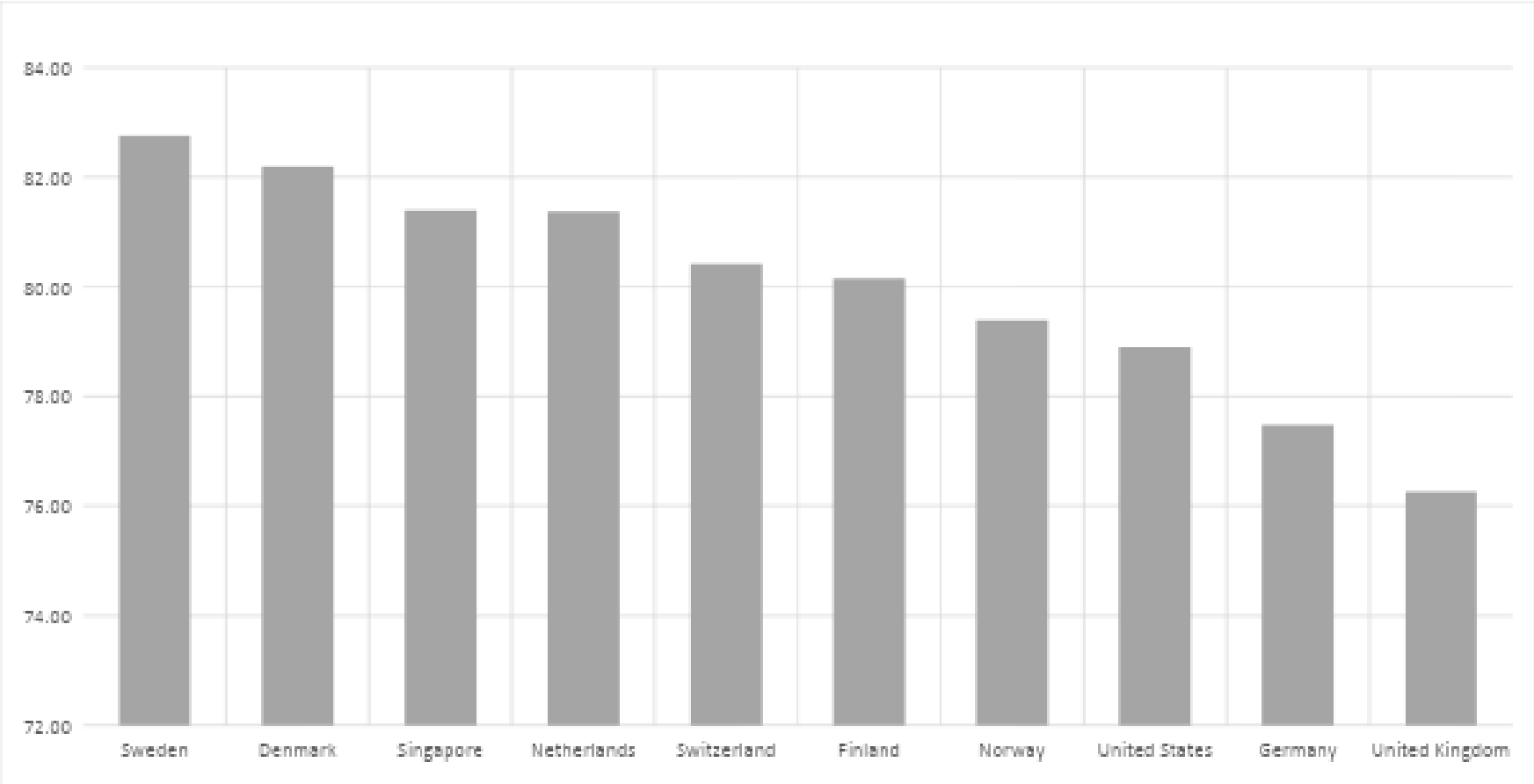

TABLE 1 Descriptive statistics and correlations

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Digital Readiness Index	1												
(2)	Technology sub-index	0.983**	1											
(3)	People sub-index	0.976**	0.946**	1										
(4)	Governance sub-index	0.971**	0.937**	0.933**	1									
(5)	Impact sub-index	0.965**	0.942**	0.923**	0.906**	1								
(6)	Culture	-0.303**	-0.291**	-0.287**	-0.295**	-0.311**	1							
(7)	Openness	0.412**	0.432**	0.347**	0.394**	0.433**	-0.101	1						
(8)	Country GDP per capita	0.820**	0.851**	0.762**	0.777**	0.799**	-0.265**	0.452**	1					
(9)	Country Population	-0.001	-0.001	0.025	0.003	-0.036	-0.087*	-0.190*	-0.079	1				
(10)	Country GDP	0.288**	0.302**	0.294**	0.270**	0.250**	0.004	-0.151	0.231**	0.563**	1			
(11)	Country Inflation	-0.092	-0.114	-0.80	-0.095	-0.061	0.036	-0.042	-0.070	-0.012	-0.025	1		
(12)	GDP growth rate	-0.087	-0.080	-0.131	-0.061	-0.064	0.026	0.042	-0.129	0.083	-0.007	-0.695**	1	
(13)	Global Crypto Adoption Index	0.137	0.111	0.177*	0.153	0.089	-0.053	-0.091	-0.037	0.405**	0.408**	0.324**	-0.206*	1
Mean		49.49	42.22	46.49	56.92	52.34	57.36	89.18	17200	5.3 E+7	6.2E+11	27.69	2.57	0.13
S.D.		16.84	19.62	16.99	18.08	14.44	6.92	60.6	22088	1.7 E+8	2.2E+12	259.33	3.68	0.18
Min		14.8	6.45	8.25	16.95	21.32	32.75	0.00	271	3.5 E+5	1.6E+9	-3.23	-26.00	0.00
Max		82.75	85.67	80.81	91.30	88.17	74.00	387.10	116639.88	1.4E+9	2.05E+13	3000.00	9.46	1.00

***$p < .001$. **$p < .01$. *$p < .05$. $^{+}p < .1$

TABLE 2 Analysis of Digital Readiness and its sub-indexes effect on Global Crypto Adoption

	H1 (DV= Global Crypto Adoption Index)					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Culture	-0.073	-0.038	-0.034	-0.031	-0.041	-0.029
Openness Index	0.062	0.012	0.032	0.021	0.029	0.016
Country GDP per capita	-0.116	-0.424**	-0.368**	-0.378**	-0.288**	-0.410**
Total Population	0.222*	0.231**	0.224**	0.231**	0.238**	0.234**
Country GDP	0.328**	0.259**	0.266**	0.271**	0.290**	0.261**
Inflation	0.324**	0.363**	0.376**	0.345**	0.317**	0.353**
GDP growth	-0.013	0.009	0.044	-0.007	-0.025	0.006
Technology sub-index		0.427**				
People sub-index			0.396**			
Governance sub-index				0.396**		
Impact sub-index					0.255*	
Digital Readiness Index						0.424**
Observations	128	128	128	128	128	128
F	8.594	17.294	20.526	19.921	12.551	19.048
R Square	0.334	0.379	0.395	0.392	0.355	0.388
ΔR Square		0.045**	0.061**	0.058**	0.021*	0.054**

***$p < .001$. **$p < .01$. *$p < .05$. $^{+}p < .1$
Coefficients in the table are standardized

A. Technology pillar
1st sub-pillar: Access
1.1.1 Mobile tariffs
1.1.2 Handset prices
1.1.3 Internet access
1.1.4 4G mobile network coverage
1.1.5 Fixed-broadband subscriptions
1.1.6 International Internet bandwidth
1.1.7 Internet access in schools
2nd sub-pillar: Content
1.2.1 GitHub commits
1.2.2 Wikipedia edits
1.2.3 Internet domain registrations
1.2.4 Mobile app development
3rd sub-pillar: Future Technologies
1.3.1 Adoption of emerging technologies
1.3.2 Investment in emerging technologies
1.3.3 ICT PCT patent applications
1.3.4 Computer software spending
1.3.5 Robot density

B. People pillar
1st sub-pillar: Individuals
2.1.1 Internet users
2.1.2 Active mobile-broadband subscriptions
2.1.3 Use of virtual social networks
2.1.4 Tertiary enrollment
2.1.5 Adult literacy rate
2.1.6 ICT skills
2nd sub-pillar: Businesses
2.2.1 Firms with website
2.2.2 Ease of doing business
2.2.3 Professionals
2.2.4 Technicians and associate professionals
2.2.5 Business use of digital tools
2.2.6 R&D expenditure by businesses
3rd sub-pillar: Governments
2.3.1 Government online services
2.3.2 Publication and use of open data
2.3.3 Government promotion of investment in emerging technologies
2.3.4 R&D expenditure by governments and higher education

C. Governance pillar
1st sub-pillar: Trust
3.1.1 Secure Internet servers
3.1.2 Cybersecurity
3.1.3 Online access to financial account
3.1.4 Internet shopping
2nd sub-pillar: Regulation
3.2.1 Regulatory quality
3.2.2 ICT regulatory environment
3.2.3 Legal framework's adaptability to emerging technologies
3.2.4 E-commerce legislation
3.2.5 Privacy protection by law content
3rd sub-pillar: Inclusion
3.3.1 E-participation
3.3.2 Socioeconomic gap in use of digital payments
3.3.3 Availability of local online content
3.3.4 Gender gap in Internet use
3.3.5 Rural gap in use of digital payments

D. Impact pillar
1st sub-pillar: Economy
4.1.1 Medium- and high-tech industry
4.1.2 High-tech exports
4.1.3 PCT patent applications
4.1.4 Labor productivity per employee
4.1.5 Prevalence of gig economy
2nd sub-pillar: Quality of Life
4.2.1 Happiness
4.2.2 Freedom to make life choices
4.2.3 Income inequality
4.2.4 Healthy life expectancy at birth
3rd sub-pillar: SDG Contribution
4.3.1 SDG 3: Good Health and Well-Being
4.3.2 SDG 4: Quality Education
4.3.3 SDG 5: Gender Equality
4.3.4 SDG 7: Affordable and Clean Energy
4.3.5 SDG 11: Sustainable Cities and Communities

Source: https://networkreadinessindex.org/