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The Pros and Cons of Technological Innovations in Financial Services

Abstract. *There is a large variety of technologies that have been used in the financial services sector. However, today banks and insurance companies find themselves overwhelmed by innovators from outside their business. The list usually starts with Bitcoin, mobile payments, open application programming interface, and crowdfunding – but there seems to be no end to the diversity. Following the theory of Thorstein Veblen (1899), who was one of the first sociologist and economists to systematically study the relationships between institutions and the transformative power of technological innovation, the paper reveals the pros and cons of the application of chosen technology innovations in financial services.*

Keywords: *behavioral economics, technology, technological innovation, instrumental values, ceremonial values, cryptocurrency, mobile payments, open application programming interfaces*

Introduction

According contemporary economic theory, the economic growth is mainly driven by implementation of the new technologies. The technology is never bad, it is what the leaders in the industry do with it.

The global financial crisis of 2008 renewed wide-spread debates on the pros and cons of the financial innovations. Traditional innovation-growth view proposes that financial innovations help to reduce costs, facilitate risk sharing, they improve allocative efficiency and economic growth. The innovation-fragility

view, on the other hand, identifies financial innovations as the root that cause of the recent global financial crisis, by leading to an unprecedented credit expansion resulting in housing prices increase and by helping investment banks to design structured products that caused investors' misunderstandings of financial markets.

The aim of the contribution is to highlight the **Veblen dichotomy** that is the theoretical corner stone for the relationship between an economic growth and an innovation, to list the bright and dark consequences of some known applications of the financial innovations that were driven by Internet, and to reveal five areas of agreement among contemporary political economists on the role of political economy.

Due to the lack of data, there is a limited number of empirical studies that deal with financial innovations and their impact on economic growth. As a consequence, most existing studies take a "case study" approach and focus on specific innovations. This is also approach used in this contribution that focuss on the analyses of the pros and cons of cryptocurrencies and mobile payments as a new way to consumer business services on the internet.

1. Veblenian dichotomy and contemporary socio-economic environment

Following paragraphs contain an introduction to the theoretical framework of the technological innovation and economics. At the very beginning, technology should be defined the as the fulfillment of human purpose [Arthur 2007: 276]. In the case of the money, this purpose is the fulfillment of its functions, as a standard of abstract value, means of payment, store of value, and purchasing power to list the most important ones. Technological devices that are used in the context of the money, need to be socially consituted and regulated in order to acquire social significance and efficacy [Hodgson 2006: 1-24]. But it is noticed quite often that some participants of society do not want to be centrally regulated and supervised, and prefer to be active on the non-regulated parallel currency market.

Thorstein Bunde Veblen (1857-1929), was the one of the fist economists to analyze systematically the relationship between institutions and the transformative power of the technological innovation. As a matter of fact, he is the leader of the institutional economics, as he constructed a theoretical framework for the analysis of institutional change. He is known for combining a Darwinian evolutionary perspective with his new institutionalist approach to economic analysis. The Veblenian dichotomy was introduced in *The Theory of the Leisure*

Class (1899). The Veblenian dichotomy is based on a distinction between what he called “institutions” and “technology”. To Veblen, institutions determine how technologies are used. Some institutions push ahead “ceremonial” values while some prefer “instrumental” values. Veblen defines “ceremonial” as related to the past, while the “instrumental” orients itself toward the technological improvement, judging value by the ability to control future consequences. Those two systems of valuation are antagonistic but at the same time, they coexist, embedded in the institutional structure. Ceremonial values mirror the power relations, the distribution of status, and the individual interests that define the institutional structure. Instrumental values are directed towards the application of knowledge for the solution of specific social problems. If ceremonial values are the bastion of the status quo and the social hierarchy, instrumental thinking is the voice of progress and the “instrumental efficiency” [Tool 2000: 55].

Veblen argued that there was a fundamental split in society between those who make their way via exploit (leisure class) and those who make their way via industry. Veblen believed that technological developments would eventually lead to a socialist organization of economic affairs. Veblen’s views on socialism and the nature of the evolutionary process of economics differed sharply from that of Karl Marx. While Marx saw socialism as the final political precursor to communism, or the ultimate goal for civilization, and believed that the working class would be the group to establish it, Veblen saw socialism as one intermediate phase in an ongoing evolutionary process in society towards the business enterprise system.

Veblenian dichotomy should be studied also these days, having in mind contemporary socio-economic environment. In the global financial crisis of 2008, investment bankers at megabanks were found to be speculating with the savings that ordinary citizens had entrusted to the commercial division of that megabank. Up till now the megabanks were not forced to break themselves up into two different parts – the high-risk investment division and the more traditional commercial division. At least in the UK, there are merely no changes. Meanwhile the banks never get rid of people who gambled with their capital buffers or reputation. The banks have not broken with the accountancy firms that missed or chose to miss all the misleading items on the banks’ balance sheets and the same is true of the credit rating agencies. Indeed, the banks have spent millions in lobbying to keep inevitable increase in buffers as low as possible [Luyendijk 2015: 176-177].

The Veblenian dichotomy is facing known facts: Former Labour prime minister Tony Blair is making at least 2,5 million GBP a year as adviser to JP Morgan; Hector Sants, who as chief regulator saw his sector suddenly collapse in 2008, was offered a top job at the megabank Barclays and his estimated “compensation” was 3 million GBP a year [Luyendijk 2015: 177].

Ceremonial values in contemporary Veblenian dichotomy are represented by investment megabanks, large accounting institutions and main rating agencies. But who represent the instrumental values? The engineers of the bitcoin? Representatives of telecommunications, or start-ups?

2. Pros and cons of application of chosen financial technological innovations

Technological innovations in the financial services are defined as something new that reduces costs, reduces risks or provides an improved product/service/instrument that better satisfies participants' demands [Frame, White 2004: 118]. Thus financial innovations can be grouped as new products (e.g., exchange traded index funds); new services (e.g., internet banking); new production processes (e.g., credit scoring, electronic record-keeping for securities); or a new organizational form (e.g., internet only banks, a new type of electronic exchange for securities).

From the variety of the financial innovations, the pros and cons of their application are illustrated by cryptocurrencies and mobile payments. Moreover, open application programming interface (APIs) as a new way to consumer business services on the internet are introduced.

2.1. Cryptocurrencies driven by Internet

Majority of financial innovations are connected to the Internet that is at the moment more than 20 years old and majority of our professional and private activities as well are influenced by it. The internet fueled also the evolution of the cryptocurrencies.

There are a variety of different cryptocurrencies with bitcoin being the first and by far most popular. The **Bitcoin** is also where the innovative technology of the **blockchain** was first introduced, and this cryptocurrency developed the source code the other altcoins adopted through a process of replication and variation. Cryptocurrencies are legally defined as “convertible digital currencies” in the USA and the EU. Among 10 bitcoin-friendly countries belong Estonia, USA, Denmark, Sweden, the Netherlands (with Bitcoin city Arnhem), Finland, Canada, UK, South Korea, and Australia. Many institutions (also from financial industry) plan to use block chain (distributed ledger technology) to store digital identities in an effort to improve service to clients/inhabitants. In some countries as China and Russia the cryptocurrencies are illegal.

Bitcoin was introduced in 2008 by an anonymous developer known by the pseudonym of Satoshi Nakamoto, who published a paper detailing the currency and its decentralised system with no issuing authority that would serve as both a means of exchange but also as an anonymous and fully open system of transactions, known as the blockchain. The currency was registered on the Bitcoin.org domain [Papadopoulos 2015: 158]. The currency continued to be popular, but its use increased when the Silk Road was created.

In January 2011, an aspiring entrepreneur called Ross Ulbricht created an online market place called Silk Road. This was not just another electronic commerce Web site, Silk Road was unique in almost all of its features. First, it was not available on the normal Web. It existed in an encrypted and secretive part of the Internet called the “Dark Net”. Second, it offered a range of illegal merchandise not found on e-Bay or Amazon, mostly drugs, weapons, catering to the specific users. Third, the Silk Road was able to operate because it used a new virtual currency called Bitcoin that allowed users to remain anonymous and conduct transactions with little fear of interference by law enforcement. While Silk Road was eventually shut down and its creator arrested and convinced, the publicity of Bitcoin arose.

As the software of the Bitcoin is completely open source, any developer can download it, modify it and create its own version of the software. This possibility has led to an explosion of alternative bitcoin implementations, popularly known as altcoins. Some of the most popular implementations are IxCoin (IXC), Namecoin (NMC), LiteCoin (LTC), Ripple (XRP), Bitcoin XT [cf. Guadamuz et al., 2015: 1-27].

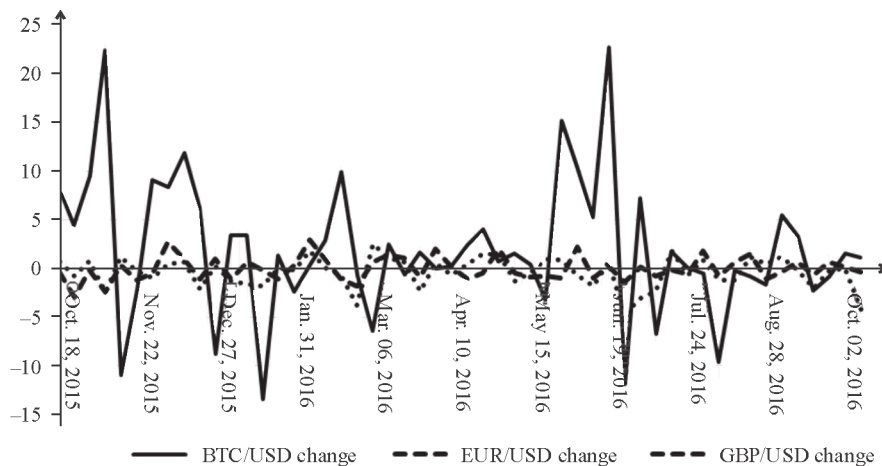
In April 2016, 29-years old Tomáš Jiříkovský, the first Czech Bitcoin hacker, was arrested. The owner of drug bazaar Sheep Marketplace was responsible to one of the biggest hack in Dark Net history of around 40 millions of USD in December 2013. He was arrested for money laundering after purchasing a luxury house and trying to launder the stolen money [DeepDotWeb 2016: 1].

In May 2016, Australian entrepreneur Craig Wright has publicly identified himself as Bitcoin creator Satoshi Nakamoto. He digitally signed messages using cryptographic keys created during the early days of Bitcoin’s development. These keys were linked to blocks of Bitcoins known to have been created or “mined” by Satoshi Nakamoto.

Among the pros of the Bitcoin definitely belong security, lower transaction costs, anonymity, resilience, and engine for innovation. The blockchain technology can store digital identities and its potential for future use is enormous.

There are also cons that should be noted. First of all it is a lack of transparency, the Bitcoin anonymity, volatility of the Bitcoin, the lack of replicability, and the theft of the Bitcoin.

Graph 1. Historical data of BTC/USD, EUR/USD and GBP/USD,
Time frame: Weekly; % Change

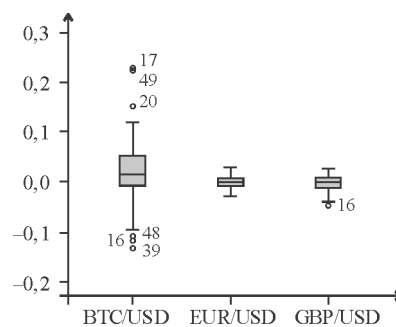


Source: own elaboration based on the data of portal www.investing.com [access: 28.09.2016].

Graph 1 reveals the development of the Bitcoin, Euro and Pound to USD changes on the week time frame over the last year. It proves that the Bitcoin is too volatile for day-to-day operations in real economy. It is evident that the currency is still used mostly for speculative purposes.

Large volatility of the Bitcoin is displayed by the box plots that provide richer information on interquartile ranges and outliers of time series.

Graph 2. Box plot of BTC/USD, EUR/USD and GBP/USD,
Time frame: Weekly; % Change



Source: own elaboration based on the data of portal www.investing.com [access: 28.09.2016].

It should be noted that the outliers depicted by a circle “o” are more than 1.5 times the inter-quartile range and less than 3 times the inter-quartile range

above the third quartile or below the first quartile. More importantly, as long as cryptocurrencies remain unregulated, it would be unlikely that the general public, both on the side of merchants and on the side of consumers, will prefer cryptocurrencies to credit cards or other official e-payment services for their day-to-day transactions. Cryptocurrencies need to acquire a critical mass of transactions beyond speculation. But price volatility poses an equally serious barrier as inappropriate legislation [Evans 2014: 6]. Most merchants do not keep any of their revenue in cryptocurrencies, but convert them daily in the official currency. Although motivation around cryptocurrencies is inspired by a utopian vision for a new monetary system without intermediation, where banks and states will have no role or power, ironically, the solution to their problems should be regulation [Papadopoulos 2015: 171]. Both, regulation and integration in the official monetary system, even adopting the existing business models of the payment industry and the commercial banks, which cryptocurrencies were designed to challenge. Only when the appropriate regulation is in place, new payment technologies can integrate and achieve their full potential.

2.2. Mobile payments

The business model based on the utilization of mobile network for payment can have also a strong social aspect. In 2007, the mobile operator Vodafone implemented system called M-PESA in Swahili region (Kenya, Tanzania, Rwanda, Burundi, etc.). Abbreviation M stands for “mobile” and “pesa” is the name of the local currency. This project brought possibility to transfer money for inhabitants in country with a low bank penetration. Vodafone provides its services in 11 countries of Africa and it owns 40% of Safaricom that is a dominant mobile phone operator in Kenya. According official information in Kenya only 27% of population has a bank account, but 74% of them proper a mobile. An individual account of the customers it connected to the telephone number and it is accessible due to application of the SIM card. Customers can insert and withdraw their money through the net of shops, where they can exchange their cash for the electronic money. Those shops function as intermediaries, often they are also called as intermediaries, and they get the fees for both kinds of transactions, insert and withdrawal of cash. Customers can use their electronic money to pay ordinary bills and all other expenditures by their mobiles. The mobile payments were for first time applied in Philippine. In the Europe this “social aspect” of the mobile payments was applied in Romania.

Mobile payments are rather popular in financially developed countries with an intensive framework of bank’s branches. In 2013, the VUB and Tatra bank

operating in Slovakia (the second and the third largest banks as to volume of assets), launched to the market project VIAMO (www.viamo.sk) that allows to apply the latest method of transferring money by use a mobile telephone directly to the telephone number of the recipient. It was made possible thanks to the IT company PosAm. The company secures its service by supervisory centre, the service desk, support and operation services of which are utilised in the form of outsourcing by the followers as the ZUNO bank and power producer Slovenské elektrárne. The project which puts maximum emphasis on the security and accessibility of the system. VIAMO is broadly used by university students as well. The most often transfers include their fees for accommodation, recharge their catering cards, fees for the international student identity card etc.

2.3. Business APIs

Another innovation that should be mentioned are the application programming interfaces (APIs). APIs has been used for many years by software developers to assemble the program components within an application. The new use of APIs is to make business functions available as components on the Internet. The challenge of APIs is to grow volumes from existing customers and attract them without the traditional marketing tricks. Rather than trying to “capture” the customers into a system, the API is opening the systems to be joined by customers in the way they desire. The cons at the moment are financial risk consideration towards the clients.

As Payment System Directive 2 (PSD2) is progressing to its implementation, the European Banking API developers such as Polish API developer Kontomatik hope that this directive enable to push banking API technology in Europe without any border. The move to the business APIs is the important decision for banks, but it is evident that they will implement API technology to sustain their competitiveness.

Conclusion

In the contribution, the topicality of the Veblen dichotomy is stressed in the financial services industry. To conclude, the institutions with “ceremonial” values are investment bankers at megabanks and largest rating agencies.

Institutions with “instrumental” values ought to be commercial banks and other financial institutions as we know them today in Poland and Slovakia that

will cooperate with institutions outside of their business (telecommunication companies, software developers, etc.).

The financial system need to be a platform that unites existing institutions (such as banks, insurances) and new institutions (such as telecommunication companies and other information technology companies). This platform allows customers freely choose new services (payment, insurances, loans, etc.) in the ways that suits them.

To Veblen, institutions determine how technologies are used. Therefore, the all technologies mentioned in the contribution contribute to the comfort the financial services. The dark side of the use of those technologies is always the institutional failure.

To summarize the pros and cons of the technological innovations in financial services, the merits and demerits of the Bitcoin will be listed first. Definitely, the most beneficial is the electronic identification based on the blockchain technology. The merits include also: affordability, as Bitcoin drastically cuts fees and increases the speed and efficiency of the transactions; immediacy, all transactions are immediate; accessibility due to its decentralized nature in countries that do not offer traditional payment service due to high fraud rates or/and due to the absence of the bank branches. The anonymity of the Bitcoin can be treated as advantage but also as disadvantage of the system. Bitcoin as a payment appeals to certain customers who would like to maintain anonymity rather than leaving a trail of their transactions. Despite of many merits of the Bitcoin, there are also demerits, that include: security, the usage of Bitcoin wallets can pose a large security threat as it was proven in the past; and volatility, though the price of the Bitcoin has a growing trend, it is very volatile comparing to other convention currencies and the price of that virtual currency can drop to the price of zero too (as it was disclosed by the Coinbase).

Pros and cons of the mobile payments are also carefully observed by the financial experts. Definitely, the M-PESA system brought the quality of 21st century payment services into extremely poor places of our planet and it improved the living conditions of millions of people. The merits of the ordinary mobile payments are especially: security, while doing transactions with mobile the client do not have to reveal card information or personal detail like it usually happens in case of credit cards; privacy, mobile payments companies does not store any information comparing the banks; speed, some mobile payments companies require PIN while some require fingerprint for the respective transactions, but the transfer is immediate; mobile wallet, physical keeping all credit cards might be risky as one may loss it anywhere, but all of them can be included into mobile wallet. Despite of many pros there are also some cons for the mobile payments that include: hardware incompatibility, there is a need of the NFC reader (Near

Field Communication) which is lack in old devices; costs, for accepting payments via mobile devices require some POS hardware which are extremely high in cost; device failure, this aspect could be an issue in case of battery drain; difficulty to read terms and conditions, since the mobile devices are usually small.

The technological innovations in financial services are dynamic and require special attention of all beneficiaries: financial institutions, payments mobile companies, clients and regulatory bodies as well.

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Wady i zalety innowacji technologicznych w usługach finansowych

Streszczenie. Sektor usług finansowych od lat korzysta z wielu różnych technologii. Dzisiaj jednakże banki i firmy ubezpieczeniowe stają w obliczu zalewu innowacji spoza branży. Listę otwierają zwykle bitcoin, płatności mobilne, otwarte interfejsy programowania (API) i crowdfunding – ale

lista wydaje się w istocie nie mieć końca. Odwołując się do teorii Thorstena Veblena (1899), jednego z pierwszych socjologów i ekonomistów, którzy systematycznie badali przemożny wpływ innowacji technologicznych na instytucje, artykuł odsłania wady i zalety zastosowania wybranych technologicznych innowacji w usługach finansowych.

Słowa kluczowe: *ekonomia behawioralna, technologia, innowacje technologiczne, wartości instrumentalne, wartości ceremonialne, kryptowaluta, płatności mobilne, otwarty interfejs programowania aplikacji*