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Lateral innovation in finance

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Our study focuses on the applicability of lateral innovation in the financial field. In the first part of this article, we discuss in detail the concepts related to lateral innovation and we differentiate between lateral and traditional innovations. Later, we will introduce a major breakthrough in the financial sector, the cryptocurrency. The aim of our analysis is to find a financial lateral innovation by processing the literature and the answers received from the in-depth interview.

Keywords: behavioural economics, blockchain, innovative cryptocurrency, lateral thinking, rationality.

JEL codes: G02, G40, O30.

Introduction

Lots of people have heard about lateral thinking, but not many of them fully understand the concept. One of the most compact definitions comes from the British author Paul Sloane (2010. 39): "lateral thinking is a counterpoint to conventional or vertical thinking. In conventional thinking, we go forward in a predictable, direct fashion. Lateral thinking involves coming at the problem from new directions – literally from the side".

Every healthy human being is capable of doing that. To reach our best lateral abilities, we can use several methods, based on the principles developed by lateral thinking pioneer Professor Edward de Bono (1970):

- The recognition of dominant polarizing ideas.
- The search for different ways of looking at things.
- A relaxation of the rigid control of vertical thinking.
- The use of chance.

As it can be seen, not every innovation is lateral innovation. For example, have you ever wondered why we no longer call cars horseless carriages? The answer is quite straightforward: because being horseless has now become the standard for modern vehicles. However, we still use terms like horsepower and several brands, like Mustang, use horse references in their names. This is a reminder for us that

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the newer innovation (car) emerged directly from historic inventions (carriage), its immediate predecessors. If we go back in time even more, we see that the design of carriages resembles the anatomy of horses, e.g. the legs became wheels and we sit on the back like riding the horse.

This kind of innovation process works in a way that is very similar to the Hegelian dialectic: a thesis (the paradigm of horse and carriage), its antithesis (horseless carriage) and the result, which is the synthesis (the modern car, which blends the two conceptions without fully negating any of them) (Gonsher 2013).

On the other side, there is the more lateral form of innovation: we step out of the existing categories and jump directly into creating a synthesis, the synthesis of originally totally different categories. For example, why not make carriages with five wheels, or no wheels at all, or with wings on top of them and create totally new types of vehicles? This free-flowing, playful and open-ended attitude to the thinking process can result in the most unusual (and often also useful) inventions. This is a field-independent approach: finance can benefit from it just as much as transportation.

This research is a scientific essay which attempts to answer the following questions:

- What are the different aspects of lateral thinking based on value innovation and how can they be integrated into the financial sector?
- With respect to financial innovation, one point needs to be established: can the continuous development of cryptocurrencies be considered as lateral innovation?

Lateral innovation

When we talk about innovation, most people think about modern technological inventions, like robots or the next generation of the ever-evolving smartphones. However, a creative person or group is not necessarily interested only in physics and technology. Finance needs creative, innovative minds as well.

Let's start with a simple example: about five thousand years ago, a creative man probably had enough of untraceable barter businesses and invented something we can call shell money (a kind of token currency without intrinsic value). That was the ancestor of all future currencies. Before that, ancient people had never thought to ask something for their goods that were not directly useful to them. However, that man thought outside the box and created something totally new that affected the whole human history. In a nutshell, this is what we call lateral innovation.

Table 1. Advantages and disadvantages of lateral innovation

Advantages	Disadvantages
Focuses on avoiding competition by creating new needs	It is harder to assimilate the innovations of lateral thinking if they are very different
Differentiating the product/service and cost efficiency are both achievable	It features more education and communication needs
Massive target audience, tolerable price level, market growth with radically higher value from the beginning	Throughout the process, the companies do not benchmark against their competitors
The possibility of creating new markets, categories and audiences, which we have not been able to do so far	The danger of lateral cannibalism: sacrificing existing possibilities to novel solutions
Makes it possible to increase sales: it can bring a totally new sales volume, which does not affect other markets, or serves the same niche with a new product	Cannot be achieved without a leader type of manager
Old and new companies can both use this strategy	Corporate culture has to adjust to it inversely
It can be considered as the innovation of innovations	Not feasible partially
Organises creative thoughts into a process-based system	The idea itself is easy to steal
Does not look over any alternatives that can lead to new alternatives	Plenty of conceptions can slow down the process
Can use product categories or services that have no connection with the existing product	Can trigger the resistance of the employees and the management
By using the value innovation technology, it is not just a way of thinking, but also a toolbox	There can be motivational, cognitive barriers for human resources
Based on value innovation, it can be high-tech, but it is not a determinant	Technological development may be delayed, so the value innovation cannot get through
It is more than growth, it is also a strategic action; it can have a huge positive effect on brand awareness and can also over-position a whole field	The business can lose its former image
Hard to copy	Lateral innovators may become successful at other companies, too

Source: Own editing

In the case of lateral innovation, plenty of conceptions can slow down the process (Table 1).

Aithal–Kumar (2016) proposed six thinking hats – a technique which outlines different thinking styles required by an individual while analysing a

given problem in an effective way – as a method that supports lateral thinking possibilities and new outcomes during problem-solving sessions in order to find the optimum solution.

Intelligent inverse innovation

In this phrase, intelligent innovation becomes inverted in a way that we come to the expected result not by the use of the traditional – linear thinking – process, but by a different, sometimes backward thinking (Szalai–Czékmann 2009).

The novel approach to innovation does not mean the full rejection of former innovation theories. The extension of the concept comes from the creative approach to competitiveness, with which the compulsion to continuously adapt to the needs of the more informed consumer can be placed in a new space of thought. The characteristic of intelligent inverse innovation is that the lateral innovator can perform novel changes that create value in the life of the company and, as a result, the product or service can be provided in a novel way, with outstanding efficiency and for new customer segments. The competitive advantage thus created is also sustainable in the long run and independent from the current business situation.

Lateral thinking makes it possible to increase sales in several ways: it can bring a totally new sales volume, which does not affect other markets, or can fill the same gap with a new category; it can also result in a growing number of other categories or create natural monopolies.

It can be stated that lateral innovations, in general, need much less investment than their traditional mates, but they are harder to integrate, they are riskier.

Even today, it is hard to define corporate competitiveness or to create a generally accepted definition that applies to all kinds of fields and corporation sizes. Linear thinking creates the base for increased competition, its possibilities are limited, and the company's development path is localized due to the lack of a lateral approach.

The practical steps of lateral individuals, who need process-managed creativity, can widen and stretch the seeming barriers and can often create a synergistic effect. The turbulent processes created this way can induce more lateral actions, which spread across the organisation in a multiplicative manner. This kind of innovation has risks, too: the thinking method on which this novel approach is based can often hit a wall, encounter an obstacle. Then the innovator has to use the inverse integration process which, if successful, can pervade the whole culture of the organisation.

With the ever-increasing complexity of systems, most managers and engineers understand that innovation and solutions require collaboration among multiple contributors. To harness the power of the group, group flow is conducive to efficient and creative work, energizes and engages team members, and supports each of the principles for agile development and design thinking (Buss 2015).

It needs high levels of trustful environment in the organisation, which can be created by the leaders. Lack of trust can lead to serious consequences, like endless and complicated contracts, total lack of cooperativeness, not saying the innovative thoughts out loud, proliferation of litigation matters, and, as a result of all these, slowing down economic growth and losing efficiency (Piricz 2013).

The rationality of behavioural economics

Earlier economic thinking was based on a rational approach whereby we have all the information at our disposal to make a decision and make the best decision (Godelier 2012).

One of the topics of rational thinking is the consumer decision theory (Samuelson–Nordhaus 2009). Generally, the literature discusses the purchasing decision mechanism in several ways. This raises a question that cannot be analysed on the basis of a standard, scientifically underlined theory. Several disciplines have already examined the factors that influence individual choices, correcting the established theories. One of them is the starting point of the classical model, which is closely related to the key assumptions of economics based on the concept of rationality.

Consumer behaviour is characterised by the desire to maximise utility, and the availability of the information necessary to make a decision ensures that he or she makes an optimal decision. However, lifelike experiences often contradict these assumptions and seem to support the arguments of alternative approaches.

Finding the best, optimal solution cannot happen without the introduction of clear, quantifiable variables. The decision maker chooses from a variety of alternatives, each of which has some value to him.

The classical economic model was refined: it does not require for the results to be guaranteed, but it introduces the concept of risk. Nevertheless, the requirement of rationality continues to emphasize the related systematic argument.

Later, many people stated that we are not always able to reach the optimal decision that can be made by utilising information perfectly (Rabin 2013). The rationale behind irrational decisions includes primarily cognitive factors, which

may override traditional economic thinking (Sipos–Tóth 2006). In particular, the development of behavioural economics has changed the approach that previously characterised economic thinking (Barberis–Thaler 2003, Camerer 1999; Foss 2003).

Cognitive dissonance is the mental conflict that occurs when beliefs or assumptions are contradicted by new information. The concept was developed in the 1950s by American psychologist Leon Festinger and became a major point of discussion and research (Encyclopaedia Britannica 2019).

Rationality is a complex behavioural theory that can be parsed into statements about preferences, perceptions, and process. McFadden et al. (2000) look at the evidence on rationality that is provided by behavioural experiments, arguing that most cognitive anomalies operate through errors in perception that arise from the way information is stored, retrieved, and processed, or through errors in process that lead to formulation of choice problems as cognitive tasks that are inconsistent at least with rationality narrowly defined. The paper discusses how these cognitive anomalies influence economic behaviour and measurement, and their implications for economic analysis.

The main purpose of rational choice theory is to lay out in clear and transparent terms what conditions are necessary and/or sufficient for the validity of statements about consistent human behaviour. Strong criteria for rationality are 'wrong' if understood as a positive description. However, their very strength provides a sharp guide for experimental social science's project of mapping the properties of individual behaviour (Schotter 2006).

The foundations of behavioural finance can be traced back to the 1970s, when psychologists Daniel Kahneman and Amos Tversky started their work on studying behavioural biases in humans. Now the question arises: How did these individuals actually classify these under a different category? The answer lies in the name itself. Kahneman and Tversky started to notice that people of different classes and categories, having nothing in common except their race, made irrational decisions while dealing with money matters in the stock market and basically acted against their own interests. Their very first paper opened a new era of discovery in finance. The publication, entitled *Judgment under Uncertainty Heuristics and Biases*, argued that people tend to differ from the logical choices in the stock market, which basically explains why these markets will remain inefficient regardless of their exposure to information (Tversky–Kahneman 1974).

The argument itself may be quite confusing by now, so let's try to simplify the findings. Financial markets are indeed very complex, but that is only one side of the story. These markets are evolving each passing day, and we owe it all to the study of behavioural finance. As soon as individuals are aware of the fact that they are under the influence of specific behavioural biases, they will try to influence their behaviour otherwise. So it can be concluded that behavioural finance is one area of study that is constantly evolving, and using it to your advantage may be extremely profitable; but the best way to protect your investments from it is to also be aware of the biases, making sure you do not let yourself become a victim (Michaels 2017).

Cryptocurrencies – innovation in finance

Financial innovation is the act of creating new financial instruments as well as new financial technologies, institutions and markets (Molyneux–Shaumroukh 1999).

The rise of cryptocurrencies

We are living in an era in which the global financial market creates an increasing pressure to innovate, but there are also more technical possibilities than ever. Information technology and computer sciences are oiling the gears of both vertical and lateral financial innovations.

One topic that has got huge attention in the recent years, even in the mainstream media, is the rise of cryptocurrencies and especially the most popular one, Bitcoin (DuPont 2019). It was invented by the so-called Satoshi Nakomoto in 2009. Still, nobody knows who is behind the alias – maybe a whole group of people. If he is a real person, he is considered the 44th richest man of the world.

From an innovator's perspective, being the innovator is very important, but if we look only at the innovation, the personal identity of the innovator may not be as important. There are several factors that together could have led to the creation of cryptocurrencies:

- The mortgage crisis, which started in 2007 and is still ongoing, has caused a great recession in the world economy. The recession triggered business managers' important strategic and institutional reactions alongside the globalisation of markets, changes in the industrial structure, the information revolution and higher customer expectations.

- People could not trust banks and governments anymore, inequality concerns, debts, inflation.

- Technical development: strong computers, developed cryptography.

- The philosophy of cryptocurrencies is rooted in libertarianism: the concept offers a vision of a better future. Technology, new needs and a vision have led to innovation.

Why are cryptocurrencies per se not lateral innovations?

Remember the example with the vehicles. By creating a carriage without horses, the inventor still works with the concept of carriages. Similarly, a bankless currency remains in the same category: currency (although an alternative one). We can see a vertical step-by-step way of innovating here.

Not long ago, economist Benjamin Klein stated: few areas of economic activity can claim as long and unanimous a record of agreement on the appropriateness of governmental intervention as the supply of money (Klein 1974).

The truth is that the concept of alternative currencies is not new at all, but it emerged centuries ago. There is some evidence of tokens that were found in ancient Greek and Roman cities (Burns 1927). About 4,000 alternative currencies were in circulation before the cryptocurrency revolution (Lietear 2004), but they soon disappeared. Now mostly numismatists are interested in buying these currencies. However, it is interesting to think why they did not last and what is different in cryptocurrencies. There may be a key to designing an alternative currency, which could last longer than its predecessors.

This is the point where the innovator should use lateral thinking and find a different approach to the problem, because vertical thinking has given no results. And this is the point where Mr. Nakomoto created something, a breakthrough in the world of alternative currencies: the blockchain. Without going into technical details, we need to have a broad understanding of blockchains in order to see why Bitcoin is different from any former alternative currencies.

The soul of the system – the blockchain

Blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data (Narayanan et al. 2016).

Why is this important to us? Before blockchains, creating decentralised money, which is safe, anonymous and cannot be spent more than once, was problematic. However, by combining cryptography, computer science, mathematics and

finance, this system makes it possible to move towards an open and decentralised financial system. (There are also experiments about other uses of the blockchain technology, e.g. in supply chain logistics. This is also lateral innovation: we use an already existing technology in new fields.)

It is quickly becoming apparent that blockchain technology is about far more than just Bitcoin. Across finance, healthcare, media, government and other sectors, innovative uses are appearing every day (Marr 2018).

Blockchain applications go far beyond cryptocurrency and Bitcoin. With its ability to create more transparency and fairness while also saving businesses time and money, the technology is impacting a variety of sectors in ways that range from how contracts are enforced to making government work more efficiently.

Smart contracts are like regular contracts, except the rules of the contract are enforced in real-time on a blockchain, which eliminates the middleman and adds levels of accountability for all parties involved in a way not possible with traditional agreements. This saves businesses time and money, while also ensuring compliance from everyone involved (Daley 2018).

Digital cash is here today, and many more smart contract mechanisms are being designed. So far, the design criteria important for automating contract execution have come from disparate fields like economics and cryptography, with little cross-communication: little awareness of the technology on the one hand, and little awareness of its best business uses on the other hand. The idea of smart contracts is to recognise that these efforts are striving after common objectives, which converge on the concept of smart contracts (Szabó 1996).

The competitiveness of cryptocurrencies

Today, there are almost 2,800 different cryptocurrencies, and this number grows day by day (Coinlore 2019). Since the rise of cryptocurrencies, we can hear more and more critical or at least sceptical voices. They are often referred to as the new investment balloon, which will eventually pop. On the other hand, if we look at them from a very optimistic angle, cryptocurrencies may replace fiat money altogether in the near future.

Cryptocurrencies indeed can have a very positive impact on economies by supporting the financial systems of the countries: although they are not the means of the monetary policy, the currency competition they generate can lead to price stability. However, by their nature, cryptocurrencies supply a limited amount of

money (this is how the system works), and a suboptimal amount of money is always prone to self-fulfilling inflation episodes.

So, what is the answer to the question of how big impact cryptocurrencies will have on the economy? Only time will tell, but most probably, they will not fully replace traditional currencies. However, this does not mean that they cannot have a huge economic effect by ending the government's monopoly on issuing money.

The problems of the untapped innovation potential

The concept of cryptocurrencies is certainly not a mature one. This is good news for creative lateral innovators and, as the growing number of successful and not as successful new cryptocurrencies shows, the creative minds of financial and mathematical professionals are already working hard. There is a big potential for innovation in this field, as there are many unresolved issues.

For example, their energy use is huge, in comparison to traditional fiat money. Cryptocurrencies can be obtained through the so-called mining process, which is a very resource intensive computing process. For comparison: Bitcoin mining consumes about as much energy (34.9 TWh/year) as the whole country of Bulgaria.

Also, because of their pseudo-anonymity and lack of proper regulation, cryptocurrencies are often used by the cyber- and traditional criminals of the world.

Complexity is another potential problem. For financially illiterate people, even using scriptural money may be too intangible at times, and we can safely say that nowadays the concept of cryptocurrencies is way too abstract for most of the population. The solution to this problem is education.

Usability is also an issue. Originally, Bitcoin and the other cryptocurrencies were supposed to be utilised for day-to-day needs, like paying the rent and buying lunch, but now they are almost entirely used as investment tools.

This is closely linked to volatility. The dilemma is: Why would I spend my Bitcoin on a Ferrari when it may cost half as much tomorrow?

And even if you do not want to buy Ferraris or anything else, volatility is still an issue with cryptocurrencies. If they negate the concept of intrinsic value (and they often do), then how should we value them? It is decentralised, so the government cannot regulate its value – only the changes in demand and supply. This can lead to the previously mentioned self-fulfilling inflation episodes.

The lateral innovation of innovation

On the boiling market of the cryptocurrencies, there are always some new and interesting products. One of them is BlockBen from Hungary. Awarded the Innovative Product of the Year title in Singapore, at the Cryptocurrency Expo 2017, this currency tries to address some of the above-mentioned problems. Its innovative quality comes from the fact that it is fully gold-backed. Also, it does not need mining, because it is already done by the company behind BlockBen. It is based on their own platform, BlockStock. An unlimited number of cryptocurrencies can be made on this platform, based on any kind of stable, real asset. (It can even be based on some valuable paintings.)

Furthermore, it is not anonymous, which lessens the possibility of criminal abuse.

The product got an innovativity award for both its technical and business concepts. It merges two big categories of cryptocurrencies and uses the advantages of both, while trying to avoid their disadvantages. As it is gold-based, investors have more trust in the currency, which has a remarkable growing potential because of the flexible platform.

We can examine another lateral innovation technique with this example: creating something new by going back to the roots. Before the twentieth century, using the gold standard was the generally accepted way of valuing money. Combining this traditional standard with the new technologies of cryptography can lead to something potentially better.

Interview with a financial innovator

We talked to *Andor Kovács*, who is himself an innovator in the financial market. He primarily provides training for clients to learn effective trading techniques. In addition, he organised the first stock exchange dinner and stock exchange camp in Hungary.

We asked him what he saw as an innovation in cryptocurrencies.

According to him, cryptocurrency creation may have been a background to reputed IT companies, because they had to improve. Another great thing has been the introduction of the MLM system, which is about collecting money. The customer has the opportunity to buy gold and then convert their money into cryptocurrency. We buy cryptocurrency based on gold and then bring people in.

Innovation comes from the packages that appear here. It may be more profitable to get into several small packages. There are newer innovations. Another innovation is the mining machinery.

But most importantly, special dealers are already dealing with this. Copying has started in the cryptocurrency market as well. There is an affiliate link. People can also connect to it. In addition to Bitcoin, the second most popular cryptocurrency is Ethereum.

Then we asked whether the appearance of Bitcoin was a real innovation.

He thinks anyone can create a coin. Bitcoin was just in time, following a period of European uncertainty.

To our question *'To what extent has the blockchain system renewed trading?',* he answered: This is actually a blockchain, which generated a bootable process. They could add anything to it. In addition, they put cryptocurrency alongside gold plating.

We were interested to find out what qualified as lateral innovation in his opinion. Andor Kovács thinks that the previous way of thinking had to be reversed. Everyone thinks it will be a world currency. But it could not change the order of the market. However, cryptocurrency is a very good innovation. Bitcoin is available to anyone at any time. A side innovation is that vending machines have been placed.

What is a related innovation? We got the following answer to this question: Automation, good for everyone. The process began in Europe two years ago. Its creation may have been a background to reputed IT companies.

What can a financial innovator learn from Bitcoin?

While, of course, stable knowledge is the basis of innovation, the fastest way to create something remarkable is through lateral thinking.

Mr Kovács emphasises that designing new and profitable financial services and products can be most efficient if we try to think outside the box and use our creative potential as much as we can.

This way of thinking is placed securely in the minds of all humans, resting on our false, limiting beliefs like: only governments can issue money; decentralised money can be spent more than once, so it will not work; electricity is dangerous, so it is not useful; there is only one possible solution to the problem. Fortunately, we are all able to step outside this box, at least once in a while. (And we will get better and better at it with every try.) Our trusted assistants in the process are good

questions, trying to combine seemingly different fields and categories, curiosity and open-mindedness. If one can master the lateral approach, it will help them not just in finances, but in all areas of their life, every time they face problems.

Conclusion

Our first research question was: What are the different aspects of lateral thinking based on value innovation and how can it be integrated into the financial sector? Using the lateral approach, companies can achieve long-term competitiveness in different areas, crossing industry boundaries. In any case, we need to bridge the gap by combining existing things or revealing a problem that has not been solved for others. Occasionally, they meet the hidden needs of users through lateral innovations in various business sectors and other public areas. The financial sector's IT support for these innovations needs to be highlighted. After the financial crisis, people's lack of confidence created the need for cryptocurrencies, whose transparency and security were enabled by the decentralised blockchain system.

The answer to our second research question (Can the continuous development of cryptocurrencies be considered as lateral innovation?) is that the appearance of cryptocurrencies is an innovative solution, but the blockchain system is a lateral innovation. These innovations are cross-sectoral: the blockchain system started in the financial sphere, but its use extends to other areas and it is expected to continue to be developed. The blockchain system can be used in different fields. The most important ones are: asset management, where it helps with trade processing; insurance, where we can use it in claim processing; the payment system can be backed by cross-border payments. Certainly, we cannot leave out smartphones and smart applications. Nowadays, we can talk about blockchain healthcare, blockchain music, blockchain government. And there are some opportunities to use it for personal identification, e.g. passports, birth certificates, wedding certificates. This also proves that lateral innovations extend across industries, and we cannot speak of a sector that does not apply the novel approach to innovation discussed above.

In the future, it would be worth exploring ways of developing lateral thinking in economic education at university level, with the help of leader-type instructors. Further opportunities for research could come from blockchain utilisation in both educational and research fields.

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