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## **CROWDFUNDING AND FINANCIAL SYSTEM MODELS\***

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### **CROWDFUNDING A MODELE SYSTEMU FINANSOWEGO**

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**Summary:** The subject of the analysis is the relationship between the development of crowdfunding and the model and development of the financial system. The research goal is an attempt to answer the question: does the dynamic development of crowdfunding as a radical financial innovation result from the model of the financial system and its structure, or the level of its innovation and digitization, or do these factors not play a significant role. Literature analysis, statistical and descriptive analysis and ranking method were used as the research method. Based on the results, it should be stated that there is no clear division of financial systems into a market or bank-based model among Western European countries, while financial systems are increasingly divided into those innovative and traditional. The development of the financial market, combined with a high level of innovation and digitization of the economy, favours the development of financial innovation in the form of crowdfunding.

**Keywords:** crowdfunding, financial system, market-based financial system, bank-based model, innovation.

**Streszczenie:** Przedmiotem analizy jest zależność między rozwojem crowdfundingu a modelem i rozwojem systemu finansowego. Cel badania stanowi próba odpowiedzi na pytanie, czy dynamiczny rozwój crowdfundingu, jako radykalnej innowacji finansowej, w wybranych krajach europejskich wynika z przyjętego modelu systemu finansowego i jego struktury, poziomu innowacyjności, czy też wskazane czynniki nie odgrywają istotnej roli, a crowdfunding należy analizować w perspektywie zmian społecznych. Jako metody badawcze

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zastosowano analizę literatury, analizę statystyczno-opisową oraz metodę rangowania. Na podstawie otrzymanych wyników należy stwierdzić, że nie ma wyraźnego podziału systemów finansowych na model rynkowy lub bankowy wśród krajów Europy Zachodniej, natomiast systemy finansowe dzielą się na te innowacyjne i tradycyjne. Rozwój rynku finansowego, połączony z wysokim poziomem innowacji i cyfryzacji gospodarki, sprzyja rozwojowi alternatywnych źródeł finansowania, jakim jest crowdfunding.

**Słowa kluczowe:** system finansowy, model rynkowy systemu finałowego, model bankowy systemu finansowego, crowdfunding.

## 1. Introduction

The term ‘crowdfunding’ is a compound neologism denoting the transfer of funds of relatively low value from an unlimited number of investors/donors, via internet platforms, with the goal of financing a business or social project (Żukrowska, 2018). As part of the digital economy, crowdfunding transcends the established rules of financing on the financial market, leading to the democratisation of capital and independence from the system of intermediaries (Baek, Collins, and Zhang, 2014; Dziuba, 2017). This leads to changes in the business models, since the investor also becomes the client, and the enterprises, apart from capital, also receive significant extra-financial benefits which are impossible to obtain through traditional financing sources (e.g. market research). This means that crowdfunding fulfils the criteria of a financial innovation, defined as a novel financial solution which prompts a change in the strategy and financial decision-making in enterprises and financial institutions.

Financial innovations are equated with the development of financial systems, which have the ability to continually evolve due to the internal, dynamic decisions of their participants and their interactions (Evstigneev, Hens and Reiner Shenk-Hope, 2004).

The analysis is thus focused on the relationship between the development of crowdfunding as a financial innovation and the model and development of the financial system, and its goal is an attempt to answer the question of whether the dynamic development of crowdfunding as a radical financial innovation results from the model of the financial system and its structure, or the level of its innovation and digitization, or if these factors do not play a significant role, and whether crowdfunding should be viewed in terms of social change. The hypotheses which were investigated were as follows:

H1: the closer a financial system is to a market-based (‘Anglo-Saxon’) model, the greater the development of crowdfunding;

H2: the more developed the financial system (in the market and institutional sense), the greater the development of crowdfunding;

H3: the higher the level of innovation and digitization of the financial system, the greater the development of crowdfunding.

## 2. Theoretical groundwork

The narrow sense of the term ‘financial system’ is understood as the mechanism of supplying the economy with money, which comprises the financial sector along with its elements, such as banks, other financial intermediaries, and organised financial markets (Tyrell and Schmidt, 2001). The broad sense of a financial system encompasses not only the financial sector, but the whole spectrum of possibilities available to non-financial sectors to gather assets, transfer revenue, acquire and distribute funds for investments, and manage the market (Tyrell and Schmidt, 2001).

The six main functions of the financial system are:

- transfer of economic assets both in time and in space, in an uncertain environment;
- uncertainty management and risk control (a well-functioning financial system facilitates the evaluation and allocation of various kinds of risk);
- settling commercial transactions in a value exchange mechanism, i.e. making payments;
- gathering assets and a mechanism of brokering between surplus operators and deficit operators in the real sphere of economy;
- information assessment for investment decisions;
- solving problems connected with information asymmetry and agency dilemmas (Bodie and Merton, 2003).

It should be noted that the functions of the financial system presented above can be considered inextricably related to the functions of financial innovations, which enable the transfer of price and credit risk, increase liquidity, and increase the accessibility of lending and equity capital (Fabozzi and Modigliani, 2003; Llewellyn, 2009). It is thus the purpose of financial innovation to increase the effectiveness of the financial system’s fulfilment of its functions, while the creation and implementation of financial innovations is tied to such factors as the domestic financial sector’s level of development, the pace of technological changes within it, links and access to knowledge, established organisational structures, and institutional changes in the financial system (Sławiński, 2011).

The functions of the financial system, especially asset transfer, were the basis for the formulation and development of the distinction between market and bank-based financial systems by Levine and other researchers (Demirgüç-Kunt and Levine, 1999; Levine, 2002a, 2002b, 2003; Matysek-Jędrych, 2007). In the market-based model, known as the Anglo-Saxon model, direct financing with the use of financial markets is dominant, offering companies broad access to various creditors and information, including financial information. On the other hand, in the bank-based model financing through financial intermediaries is dominant, giving the key role to the banks which enter into long-term relationships with companies (including ownership). This has an impact on creditworthiness assessment, but also limits the risk to the overall financial system (Zogning, 2017).

In spite of long-standing debate as to which financial system model enables better functioning in terms of funds transfer and allocation, empirical research is not conclusive, either from the perspective of economic growth (Tymoczko, 2008), closing financial exclusion gaps (Moradi, Mirzaeenejad, and Geraeenejad, 2016), or selecting external sources of financing (Chakraborty and Ray, 2004). Research on the link between the financial system and economic growth suggests the significance of the overall level of the financial system's development, and not only its structure (Narodowy Bank Polski [NBP], 2013). These results are consistent with those of Baum (Baum, Schaefer, and Talavera, 2009), who showed in an empirical model that in market-based financial systems companies are more exposed to financial risk which may influence decisions on sources of financing, but also that the level of development of the system, not its structure, plays an important role. Therefore it seems obvious that a well-developed financial system, irrespective of the adopted model, should be a source of financial innovations, especially those supporting the transfer of economic assets such as crowdfunding. Researching the rationale for the co-existence of banks and of the financial market, Boot and Thakor (1997) pointed out a correlation according to which the share of banks in financing enterprises diminishes with the rise of complexity of the financial market. This means that developed financial markets provide niches for alternative forms of financing, crowdfunding included.

### 3. Crowdfunding as a financial innovation – its development

Crowdfunding, due to the potential for change that it brings to a financial system, has been described as a radical financial innovation (Deffains-Crapsky and Sudolska, 2014). The radicality of innovation refers to the degree in which it is novel and departs from existing products and processes, and to the changes to the environment which it brings. Radical innovations will significantly change the conventions and strategies in the industry, as well as clients' expectations. They are also associated with new technology, which gives rise to new market infrastructure (Belleflamme and Colarelli O'Connor, 1998), while technical knowledge required to utilise it is completely distinct from the existing one. An important feature of radical innovation is its ability to create demand which has not been recognised so far. This new demand also creates new industries thanks to new channels of distribution and new market conduct. Crowdfunding, as a new mechanism of financial brokering using new communication technologies such as internet platforms, displays the characteristics of a radical financial innovation.

Crowdfunding is composed of three elements: the **entity requesting funding** for their social project or business venture, the **'crowd'** of potential investors, and the **internet platform** serving as the tool for communication. Thanks to the abilities of information technology, crowdfunding facilitates the acquisition of funds from a large number of Internet users in a relatively short time to enable the realisation of

a given project. However, the use of crowdfunding as a source of financing, typically for a radical innovation, requires new knowledge, both in terms of technology and in terms of communication, e.g. via the social media. Another necessity is a change in viewing the client not only as a consumer but also as an investor who is engaged in marketing a given enterprise and who has an influence on the company's decisions. Crowdfunding also demands an adjustment in the company's strategy to take advantage of the 'wisdom of the crowd', but also to meet the new challenges such as the requirement to maintain an open information policy. It is also worth noting that crowdfunding can flexibly accommodate the needs of the new demand and market, in the form of various crowdfunding models and fund acquisition strategies. Four basic crowdfunding models (Table 1) are recognised (although there are many more variations) (Dziuba, 2015), depending on the form of financing and the method of rewarding investors, which are the basis for specific solutions compliant with the legal requirements of a given country (European Commission [EC], 2016).

**Table 1.** Crowdfunding models

Model	Description	Platform examples
Debt and equity-based crowdfunding	Issue of shares ( <i>equity-based crowdfunding</i> ) or bonds ( <i>debt model</i> ). Investors, by transferring a given amount through the platform, become shareholders in or creditors of the company, thereby supporting the business venture	Crowdcube.com beesfund.com (PL)
Peer to peer (p2p) lending	Small loans, usually short-term (up to 1 year) given to individuals and/or companies in return for interest (fixed rate) on the terms agreed to by the parties	LendingClub.com Zopa.com Kokos.pl (PL)
Reward-based and sales model	Financing of a social project or business venture advertised on the platform in return for immaterial rewards, such as PR services for the sponsor, but also small gifts, such as t-shirts. In the sales model, sponsors finance the creation of a product, which they then receive as a form of gratitude	Kickstarter.com GoFondMe.com PolakPotrafi.com (PL) Wspieram.to (PL)
Donations model	Charity fundraising for social or cultural projects	WorldVision.org; JustGiving.com Siepomaga.pl (PL)

Source: (European Commission, 2016).

In Europe, crowdfunding is dynamically growing both in terms of the number of platforms, the value of realised projects, and the number of financing models. The average value of a crowdfunding campaign in 2014 was EUR 15 thousand, with 24 thousand campaigns realised, while in 2016 it reached EUR 20 thousand (33% rise), with over 38 thousand projects realised (58% rise) (Statista, 2018). In terms of capital raised by the SME sector, the period 2015-2016 saw a 110% growth in crowdfunding, while the number of realised projects grew from 9,442 in 2015 to 14,521 in 2016. However, the crowdfunding market in Europe is not growing

uniformly. The United Kingdom is the leader, with 73% of the European crowdfunding market share, which prompts it to often be considered separately in statistics. Next in terms of funds passing through internet platforms are France, Germany, the Netherlands, Finland, Spain, and Italy, which shows that crowdfunding develops mainly in the markets of the Anglo-Saxon model. The value of the crowdfunding market in Central and Eastern Europe is markedly lower than in Western Europe, the two countries with the biggest crowdfunding markets being Estonia and Poland, where the latter had 20 various platforms operating at this time (Mitřęga-Niestrój, 2018).

When it comes to crowdfunding models, the equity model is the one developing most dynamically, while also attracting higher capital values than any other model. Notably in 2016, the highest amounts for this model were obtained in Germany, although France and the Netherlands dominated the previous year. France is the leader in the reward crowdfunding market, with Germany in second place. In Central and Eastern-European countries, reward crowdfunding is dominant, although in Poland all crowdfunding models are growing.

In analysing the development of the crowdfunding market in Europe, it should be noted that the main industries obtaining capital in this way are new tech and electronic entertainment, which substantiates the definition of crowdfunding as a radical innovation with new technical knowledge requirements, but also creating demand in new, developing areas of the economy.

## 4. Methodology

Hypothesis verification was performed with the use of the statistical and descriptive analysis and ranking method.

The system model was established based on two indicators: banking system assets to GDP ratio (bank-based model), and market capitalisation to GDP ratio (market-based model) (Matysek-Jędrych, 2007). The data was obtained from the World Bank (World Bank, 2018), the Polish National Bank (NBP, 2013, 2014, 2015, 2016), and Eurostat (2018).

The level of development for the given financial market was assessed based on the financial system effectiveness model (Čihák, Demirgüç-Kunt, Feyen, and Levine, 2012), employed by the International Monetary Fund. The model is the basis for the Financial Development Index (FDI), which analyses the structure of the financial market, the accessibility and the quality of financial services on offer, and the stability of the financial system (International Monetary Fund [IMF], 2018).

The level of innovation of a given economy's financial system was assessed using the Global Innovation Index (GII) (Global Innovation Index [GII], 2018), and the European Innovation Scoreboard (EIS) (European Innovation Index, 2018), while the level of digitization in the economy and society was assessed with the Digital Economy and Society Index (Digital Economy and Society Index [DESI],

2018). The Global Innovation Index (GII) measures innovation in 126 countries, which constitute 96.3% of global GDP, combining about 80 different indicators pertaining to innovation. The European Innovation Scoreboard (EIS) assesses the level of innovation in EU Member States and other European States in four areas: framework conditions, investment, innovation, and impacts, which together comprise the analysis of 27 various indicators (European Innovation Index, 2018). Finally, DESI tracks the digital efficiency and evolution of EU Member States in terms of digital competitiveness. DESI is comprised of five categories: connectivity, human capital (digital skills), use of the Internet by citizens, integration of technology, and digital public services.

The years 2010, 2013, and 2016 were chosen as the sample period representative of crowdfunding development.

The selection of countries to be analysed was made based on comparative research in their overall financial system structures, which distinguished four groups of European countries (NBP, 2013):

- Countries with predominantly market-based financial systems: the Netherlands, the United Kingdom, Denmark, Belgium, France, Finland, and Sweden. The financial system structure of these countries bears a closer resemblance to that of the United States than to those of other EU countries.
- Countries with bank-based systems: Austria, Germany, Greece, Italy, Portugal, and Spain. The financial structure of those countries is more similar to that of Japan.
- Eastern European countries: Bulgaria, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. This group includes countries which joined the EU in 2004 or 2007. Their financial systems (both the banking sector and the financial markets) are smaller than those of countries which joined the EU before 2004.
- Other countries – Ireland, Malta, Cyprus, and Luxembourg – were classified separately, since their financial systems exhibit very large banking sectors and high ratios of credit to GDP. This group was not included in further analysis.

The results obtained as described, were compared with the values of the crowdfunding markets in Europe, specifically the amount of finance raised by Internet platforms in selected European countries in 2016 (in EUR millions), and the value of crowdfunding markets by model in EUR millions from 2010 to 2016. Another consideration addressed the specific regulations pertaining to crowdfunding, since, as shown by research (Ziegler et al., 2018), the adaptation of regulations to the innovative instruments of crowdfunding correlates positively with crowdfunding growth, in terms of the number of platforms and amount of raised capital.

The final results of the analysis were formulated with the ranking method, which places various items (in this case, indices) on a scale of natural numbers in the order of their values – from highest to lowest, or in reverse order. The method assumes that the analysed values are of equal importance (Stabryła, 2000). In the presented analysis, ranks were assigned in four areas related to the hypotheses presented above.



## 5. Results and discussion

For the purpose of hypothesis verification, the results of the analysis are presented in Table 2.

The ranking presented in Table 2 does not show an obvious distinction between bank and market-oriented systems in Europe, since both in terms of capitalisation and banking assets relative to GDP the same four countries hold the first four places (i.e. the United Kingdom, Sweden, Denmark, and the Netherlands – which belong to the market-based model). France has rank sixth in capitalisation and fifth in bank assets to GDP. This means that the countries described in the literature as definitive representatives of the market-based financial system also have a strong banking sector. What is also interesting is that Germany, an exemplary country with a bank-based model, ranks tenth in the ratio of banking assets to GDP and ninth in the market-based model, and although it is clear that analysing models of the financial system requires a number of metrics such as the number of bank branch offices per capita or employment in the banking sector, the indices used in the analysis do suffice in assessing financial system models in the context of crowdfunding development.

Countries with the market-based model do in fact have the highest levels of crowdfunding in terms of realised projects. Even if the United Kingdom is excluded from the list, other market-based countries such as the Netherlands, Finland, Denmark and Sweden receive high ranks, which means that hypothesis 1, relating market-based financial systems to the increased development of crowdfunding, can be considered true. An interesting result in the context of crowdfunding growth is third place of Germany, a country with a theoretically bank-based financial system. However, it should be specified that the leading model developing in Germany is equity crowdfunding which, unlike other models, has been regulated in that country and additionally received support from innovative industries which engage in this type of funding. This, paradoxically, constitutes support for the market-based model of business financing.

Hypothesis 2 also obtains confirmation, since countries with a highly developed financial market (Financial Development Index) also rank highly when it comes to growth of crowdfunding. These are the United Kingdom, the Netherlands, Finland, and France, which have additionally introduced separate regulations for crowdfunding.

On the other hand, as far as the level of innovation and digitization is concerned (which hypothesis 3 posits as advantageous for the development of crowdfunding as financial innovation), it must be noted that the countries with the highest indices in this area, i.e. Denmark and Sweden, rank below the top five in crowdfunding market development. The United Kingdom, which is the leader on the crowdfunding market, ranks second in digitization measured with GII, and fifth with DESI. This means that hypothesis 3 is borne out only in part, since countries such as Spain or Italy, ranking sixth and seventh respectively in crowdfunding market development, are outside of the top 10 in terms of innovation and digitization. The innovation and digitization



Table 2. Crowdfunding models

Area	1) Financial system models		2) Financial market – development		3) Innovation and digitization of economy and society			4) Crowdfunding development		
	Capitalisation/ GDP	Banking assets/ GDP	Financial development Index	Rank	GII	EII	DESI	Value	Model*	Regulation
Country	<b>Rank</b>	<b>Rank</b>	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank
Sweden	1	3	6	1	1	1	3	9	5	3
Denmark	2	4	10	4	2	2	1	8		4
United Kingdom	3	1	2	2	7	7	5	1	1	1
Netherlands	4	2	5	5	5	5	4	4	4	6
Finland	5	8	9	9	3	3	2	5		2
France	6	5	4	4	7	9	14	2	2	5
Belgium	7	9	12	12	10	6	6	12		7
Spain	8	6	1	1	13	15	11	6	6	10
Germany	9	10	7	7	6	4	10	3	3	9
Italy	10	13	3	3	14	16	19	7	8	12
Portugal	11	11	8	8	15	14	12			
Poland	12	18	14	14	21	20	18	12	10	
Austria	13	7	11	11	8	8	8	16		8
Czechia	14	14	17	17	12	13	16	13	9	11
Greece	15	12	13	13	22	17	21			
Slovenia	16	17	15	15	16	11	13		7	
Estonia	17	16	16	16	11	12	7	10		
Bulgaria	18	20	15	15	20	22	20			
Lithuania	19	21	21	21	18	19	9	15		
Slovakia	20	19	19	19	19	18	17			
Latvia	21	15	20	20	17	21	15	14		

\*Countries with more than one model of crowdfunding.

Source: own research.

factor, understood as accessibility of the Internet and awareness of innovative sources of financing, is therefore less relevant, and does not constitute a barrier to the development of crowdfunding. Poland is outside of the top 10 in all categories, the most troubling of which seem to be the low levels of innovation, digitization, and expenditure for research and development. In spite of that, crowdfunding in Poland is developing most dynamically out of all the Central and Eastern European countries, also pointing to the necessity for effective regulation, which actually means an increase of funding opportunities, especially for the SME sector.

## 6. Conclusion

The literature on this subject lacks broad analyses investigating the dependencies between the financial system and crowdfunding, hence the article is an important step towards a discussion of this subject matter. Debating the development of crowdfunding itself seems foregone at this stage, since, as shown in the analysis, this form of financing is dynamically developing and will continue to do so, although not equally in every country. In answering the research question: does the dynamic development of crowdfunding as a radical financial innovation result from the model of the financial system and its structure, or the level of its innovation and digitization, or do these factors not play a significant role, it should be noted that:

- there is no obvious distinction between bank and market-oriented systems in Europe, because the countries described in the literature as definitive representatives of the market-based financial system also have a strong banking sector;
- the closer a financial system is to a market-based ('Anglo-Saxon') model, the greater the development of crowdfunding and the more developed the financial system (in the market and institutional sense), the greater the development of crowdfunding;
- a high level of digitization and innovation is not a prerequisite for the development of crowdfunding, although undoubtedly, along with the new legal regulations for this form of financing, it promotes its development.

In the authors' view, further analysis using social factors is needed.

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