“Financing losses from natural and man-made disasters by use of crowdfunding”

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FINANCING LOSSES FROM NATURAL AND MAN-MADE DISASTERS BY USE OF CROWDFUNDING

Abstract

The level of insured losses from natural and man-made disasters occurred in the world from 2012 to 2016 did not exceed 30-45%. Therefore, it is necessary to study another perspective source of financing losses refunding from natural and man-made disasters. The objective of this research is to consider financing losses from natural and man-made disasters by use of crowdfunding, especially in emerging countries. It was defined that the most appropriate model of crowdfunding for financing losses from natural and man-made disasters is donation model with reward-based and donation-based business models. Stimulus for individuals to take part in crowdfunding for financing losses from natural and man-made disasters can be different depending on their location and business model. Sets of assessments based on four categories of questions and method of results visualization were used to examine a country's readiness for crowdfunding on the example of Ukraine. Complete level of Ukraine's readiness for crowdfunding was defined. It shows that reward-based crowdfunding is the first stage towards crowdfunding implementation and development. Further research should be done to investigate the mechanism of using a tax discount in case of implementation of the reward-based crowdfunding for financing losses from natural and man-made disasters.

Keywords crowdfunding, insured and uninsured losses, natural and man-made disasters

JEL Classification G32, G22, Q51

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INTRODUCTION

Financing losses by use of crowdfunding can become quite perspective in the conditions of high level of uninsured losses from natural and man-made disasters in the world and lack of public financial resources to cover damage from such catastrophic events, primarily in emerging countries.

The issue of natural and man-made disasters has received considerable attention in publications of L. Coleman (2006), M. K. Van Aalst (2006), S. L. Cutter, L. Barnes, M. Berry, C. Burton, E. Evans, E. Tate, J. Webb (2008). The concept of crowdfunding as a source of funding for entrepreneurs has been studied by many researchers, namely E. M. Gerber, J. S. Hui, P.-Y. Kuo (2012), P. Belleflamme, T. Lambert, A. Schwienbacher (2014), E. Mollick (2014). But previous studies of crowdfunding have not examined it for financing losses from natural and man-made disasters.

Therefore, the objective of this research is to consider financing losses from natural and man-made disasters by use of crowdfunding, especially in emerging countries.

To achieve the goal, such tasks were done:

- to investigate the dynamics of victims and economic losses from natural and man-made disasters occurred in the world from 2012 to 2016;
- to define a model of crowdfunding and stimulus for individuals to take part in crowdfunding for financing losses from natural and man-made disasters;
- to assess a country's readiness for crowdfunding on the example of Ukraine using infoDev/The World Bank's self-assessment tool.

The abovementioned tool comprises four categories of questions: technology, culture, regulation, capital. This makes possible to assess a country's readiness for crowdfunding in each category and in conjunction. A major problem with the infoDev/The World Bank's self-assessment tool is its focusing mainly on assessing country's readiness for crowdfund investing. Whereas, to achieve the goal of this research, donation model of crowdfunding is taken into account. But, if a country is ready for crowdfund investing, then, it means also its readiness for donation crowdfunding.

The research data in this article are drawn from Swiss Re Institute.

This paper has been divided into two parts. The first part deals with investigation of the dynamics of victims and economic losses from natural and man-made disasters occurred in the world from 2012 to 2016. The second part deals with model of crowdfunding, stimulus for individuals to take part in crowdfunding for financing losses from natural and man-made disasters and assessing a country's readiness for crowdfunding on the example of Ukraine.

1. VICTIMS AND ECONOMIC LOSSES FROM NATURAL AND MAN-MADE DISASTERS

The number of natural and man-made disasters across the world was stable over 300 during the last five years. The dynamics of victims and economic losses from natural and man-made disasters occurred in the world from 2012 to 2016 is presented in Table 1.

Table 1 shows that the share of natural catastrophe-related losses is higher and insured less than the share of man-made disaster-related losses. It can be explained by statement that natural catastrophes are less insurable in comparison with man-made disasters because of their recurrence, which makes them more predictable with likelihood of almost 1. This contradicts the theory of probability in insurance. At the same time, man-made disasters are often the consequence of negligence and human errors. This causes problems of moral hazard and adverse selection in insurance. Thus, insurance has considerable restrictions, is quite expensive and does not provide full cover.

The general level of insured losses from natural and man-made disasters occurred in the world from 2012 to 2016 did not exceed 30-45%. Therefore, most of the total losses were not financed by insurers. Because of this, it is necessary to find sources to cover uninsured losses.

It is especially actual issue for emerging countries including Ukraine where insurance penetration (1.4% in GDP) and insurance density (USD 30.0 premiums per capita) are significantly less than in developed countries (Swiss Re, 2016, pp. 45-46). One of the worst catastrophes in terms of victims happened in Ukraine in 2014 (Table 2).

Table 2 presents that it is typical for Ukrainian people to suffer from natural and man-made disasters. Possibilities of state budget in financial support of casualties after such catastrophes are limited. This confirms an objective necessity to create new sources of financing losses from natural and man-made disasters.

Table 1. The dynamics of victims and economic losses from natural and man-made disasters occurred in the world from 2012 to 2016

Source: compiled by the author based on Swiss Re Institute's data.

Indicator	Disaster	2012		2013		2014		2015		2016	
		Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Number of disasters	Natural	168.0	52.8	150.0	48.7	189.0	56.3	198.0	56.1	191.0	58.4
	Man-made	150.0	47.2	158.0	51.3	147.0	43.8	155.0	43.9	136.0	41.6
	Total	318.0	100.0	308.0	100.0	336.0	100.0	353.0	100.0	327.0	100.0
Victims	Natural	8948.0	64.2	20201.0	78.0	7066.0	55.3	19365.0	73.5	6884.0	63.2
	Man-made	4981.0	35.8	5702.0	22.0	5711.0	44.7	6994.0	26.5	4014.0	36.8
	Total	13929.0	100.0	25903.0	100.0	12777.0	100.0	26359.0	100.0	10898.0	100.0
Economic losses, in bn USD	Natural	178.0	95.7	131.0	93.6	101.0	91.8	80.0	87.0	166.0	94.9
	Man-made	8.0	4.3	9.0	6.4	9.0	8.2	12.0	13.0	9.0	5.1
	Total	186.0	100.0	140.0	100.0	110.0	100.0	92.0	100.0	175.0	100.0
a) insured losess, in bn USD	Natural	71.3	40.0	37.0	28.3	27.7	27.5	27.8	34.7	45.9	27.7
	Man-made	6.0	74.5	7.9	87.4	7.0	77.3	9.0	74.9	7.8	86.6
	Total	77.2	41.5	44.9	32.1	34.7	31.6	36.8	40.0	53.7	30.7
b) unisured losess, in bn USD	Natural	106.7	60.0	94.0	71.7	73.3	72.5	52.2	65.3	120.1	72.3
	Man-made	2.0	25.5	1.1	12.6	2.0	22.7	3.0	25.1	1.2	13.4
	Total	108.8	58.5	95.1	67.9	75.3	68.4	55.2	60.0	121.3	69.3

Table 2. The dynamics of victims from natural and man-made disasters occurred in Ukraine from 2012 to 2016

Source: compiled by the author based on Swiss Re Institute's data.

Year	Date	Event	Type	Victims	Losses
2012	January 21–February 20	Cold wave, severe frost	Weather-related catastrophe	824 dead*	0.7 bn USD (including 0.25 bn USD insured loss)*
	April 15 – July 31	Drought			1.69 bn USD
	December 7 – December 31	Cold wave		317 dead**	no data
2013	March 29	Fire at coal-fired power plant	Man-made disaster	1 dead, 8 injured	no data
2014	July 17	Malaysia Airlines Boeing (flight MH17) crashes in unknown circumstances	Man-made disaster	298 dead	no data
2015	March 4	Gas explosion at a coal mine	Man-made disaster	33 dead	no data
	October 19	Fire and explosion at an ammunition depot destroy or damage 1079 houses (Svatovo)		4 dead, 54 injured, 3082 homeless	no data
2016	January 1 – January 12	Cold spell	Weather-related catastrophe	37 dead	no data

Notes: * Including Russia, Romania, Italy, Poland et al. ** Including Russia, Poland, Serbia, Czech Republic.

2. MODEL OF CROWDFUNDING, STIMULUS FOR INDIVIDUALS AND COUNTRY'S READINESS FOR CROWDFUNDING

Low purchasing power, unavailability and underdevelopment of insurance, absence of mutual insurance in the majority of emerging countries lead to creation of other sources of financing losses from natural and man-made disasters. Wish to help in difficulties is a distinctive feature of character of most individuals. Therefore, crowdfunding can be used for financing losses from natural and man-made disasters. There are two models of crowdfunding:

- investing, when funders expect monetary compensation;
- donation, when "funders donate without expecting monetary compensation" (infoDev/ The World Bank, 2013, p. 20). Donation crowdfunding model divides into reward-based and donation-based business models. Therefore, these business models of crowdfunding are more appropriate for financing losses from natural and man-made disasters because of their donation character.

The role of government in launching crowdfunding for financing losses from natural and man-made disasters is in providing law regulation of functioning of the crowdfunding platform and implementation of stimulus for individuals to involve and encourage them to take part in crowdfunding (Figure 1).

The next stage is to assess a country's readiness for crowdfunding on the example of Ukraine taking into account questions from different categories:

A) technology;

B) culture;

C) regulation;

D) capital.

All questions for Tables 3-6 are from pages 65-66 of this resource http://www.infodev.org/infodev-files/infodev_crowdfunding_study_0.pdf.

The first category to assess a country's readiness for crowdfunding is questions about technology (Table 3).

Source: own study.

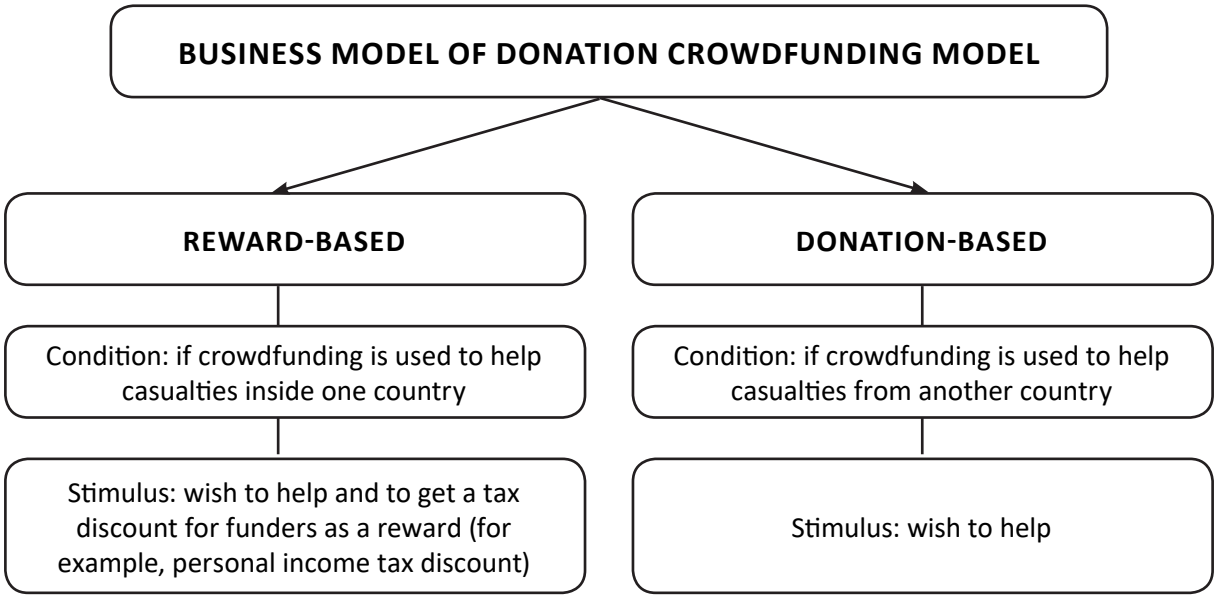


Figure 1. Stimulus for individuals to take part in crowdfunding for financing losses from natural and man-made disasters

Table 3. Assessing a country's readiness for crowdfunding: technology (A)

Source: compiled by the author based on data from UIP (https://uip.me/2016/07/smartphones-in-ukraine/) and "Media Ownership Monitor" in Ukraine (http://ukraine.mom-rsf.org/fileadmin/Editorial/Ukraine/Documents/D-33.pdf)

N	Question	Score	Explanation
1	What is the level of Internet and/or mobile smartphone penetration in the country? (1 = low, 10 = high)	5	The level of mobile smartphone penetration was 33% in 2015. The level of Internet penetration was 64% in 2016
2	What is the most readily available speed of mobile connectivity in urban areas in the country? (1 = no connectivity, 4 = 2G connectivity, 7 = 3G connectivity, 10 = 4G connectivity)	7	4G is being planned to launch not earlier than in 2018
3	How engaged is the population via social media including LinkedIn, Facebook, Twitter, other local social networks? (1 = very low utilization, 10 = very high utilization)	7	73% in 2015
4	What is the average education level reached in the country? (1 = less than 4 years, 10 = over 12 years of education)	10	12 years at school and 6 years at university (4 years for bachelors and 2 years for master students)
5	Are business skills (accounting, marketing, and so on) learned? (1 = on the job, 10 = in education or formal training)	5	Getting business skills is not common for students of non-economic specialties
6	The banking system uses and supports electronic funds transfers, or are other Internet or mobile money transaction enabled services available? (1 = not common, 10 = very common)	5	Not all banks
	Total	39	

Ukraine got 39 points in assessing a country's readiness for crowdfunding by technology. It is 6.5 points of individual level of readiness for crowdfunding in this category of questions (39/6). It means that technology is readily available and used. In such a case, experts recommend to "engage in events and use technology and social media to promote crowdfunding …" (infoDev/The World Bank, 2013, p. 68).

Another category to assess a country's readiness for crowdfunding is questions about culture (Table 4).

Ukraine got 57 points in assessing a country's readiness for crowdfunding by culture. It is 5.2 points of individual level of readiness for crowdfunding in this category of questions (57/11). It means "moderately developed entrepreneurial capacity and some investment risk tolerance" (infoDev/The World Bank, 2013, p. 69). In such conditions, experts recommend to continue "… training and mentorship programs, launch broader initiatives that engage early success stories in actively building the ecosystem, create external linkages for additional capacity" (infoDev/The World Bank, 2013, p. 69).

The next category to assess a country's readiness for crowdfunding is questions about regulation (Table 5).

Table 4. Assessing a country's readiness for crowdfunding: culture (B)

Source: compiled by the author.

N	Question	Score	Explanation
1	As a career path, how favorably do people view entrepreneurship in the country? (1 = not very favorably, 10 = very favorably)	5	It is about 450 entrepreneurs per 10000 people*
2	In making investments, how risk-tolerant are people in the country? (1 = people don't take risks with their investments, 10 = people understand risk and include a small portion of high risk investments as part of their investment strategy/ portfolio)	5	It depends on character of people
3	How risk-tolerant are people in the country to changing jobs? (1 = people don't take risks with their careers, 10 = people understand risk and include changing jobs as part of their career advancement strategy)	5	It depends on character of people

Table 4 (cont.). Assessing a country's readiness for crowdfunding: culture (B)

N	Question	Score	Explanation
4	In general, are actions more driven by more individualistic goals or group goals? (1 = people act individually, 10 = people make decisions based on group dynamics)	3	Primarily people act individually
5	How would you describe the general level of trust between individuals within the society/culture? (1 = building trusting relationship between individuals takes a great deal of time and experience, 10 = trusting relationships form quickly)	3	Building trusting relationship between individuals takes time and experience
6	How much trust do individuals have in the businesses they have relationships with? (1 = it is unusual for businesses to build trust with their customers, 10 = brands/businesses can build strong bonds of trust)	3	It is not common for businesses to build trust with their customers
7	How much trust is there between individuals and their government? (1 = low levels of trust, 10 = high levels of trust)	3	There is a little trust between individuals and their government
8	Are incubators/accelerators in the country actively teaching entrepreneurship? (1 = incubators/ accelerators are physical spaces with no educational programming, 10 = incubators/accelerators are physical spaces with active training curriculum on how to successfully start and grow a business)	7	Incubators/accelerators are physical spaces with training curriculum on how to successfully start and grow a business
9	Is entrepreneurship in the country fostered by the government and/or NGOs? (1 = not at all, 10 = very much so)	5	Tax law is not quite stable in this field
10	Are people accustomed to buying and selling goods and services online? (1 = buying and selling online is not common, 10 = buying and selling online is very common)	8	Not for all goods and services (for instance, financial)
11	How comfortable are people using online rating mechanisms (for example, the like button, feedback, star ratings, and so on) on websites? (1 = not comfortable using online rating systems, 10 = very comfortable using online rating systems)	10	
	Total	57	

Note: * State Statistics Service of Ukraine (ukrstat.gov.ua).

Ukraine got 24 points in assessing a country's readiness for crowdfunding by regulation. It is 6 points of individual level of readiness for crowdfunding in this category of questions (24/4). It means existence of regulation to encourage investment. In such situation, experts recommend that "Governments should encourage the use of donation and perks-based crowdfunding" (infoDev/ The World Bank, 2013, p. 69).

The last category to assess a country's readiness for crowdfunding is questions about capital (Table 6).

Table 5. Assessing a country's readiness for crowdfunding: regulation (C)

Source: compiled by the author based on publication of Audit Accounting Outsourcing (http://www.buhuslugi.com.ua/ru/informatsiya/informatsiya-dlya-fizicheskikh-lits/kak-samostoyatelno-zaregistrirovat-flp.html#q1)

N	Question	Score	Explanation
1	What is the level of regulation/process complexity involved in starting a business today? (1 = very burdensome, 10 = very easy)	8	It is almost easy and quickly
2	What is the level of regulation/process/expense around hiring and firing employees? (1 = very burdensome, 10 = very easy)	9	If entrepreneur has hired workers, it is necessary to submit 1 report monthly and 1 report quarterly
3	What is the level of regulation around going out of business/ closing a business? (1 = very burdensome, 10 = very easy)	7	It takes 1 week to close business, but entrepreneur can wait for tax audit quite long (1 month – 1 year)
4	In evaluating financial regulation, to what degree does investor protection take precedence over the ability of businesses to raise money to start or grow? (1 = government is focused primarily on investor protection, 10 = government is focused primarily on access to capital for businesses)	0	Government is focused primarily neither on investor protection nor on access to capital for businesses
	Total	24	

Table 6. Assessing a country's readiness for crowdfunding: capital (D)

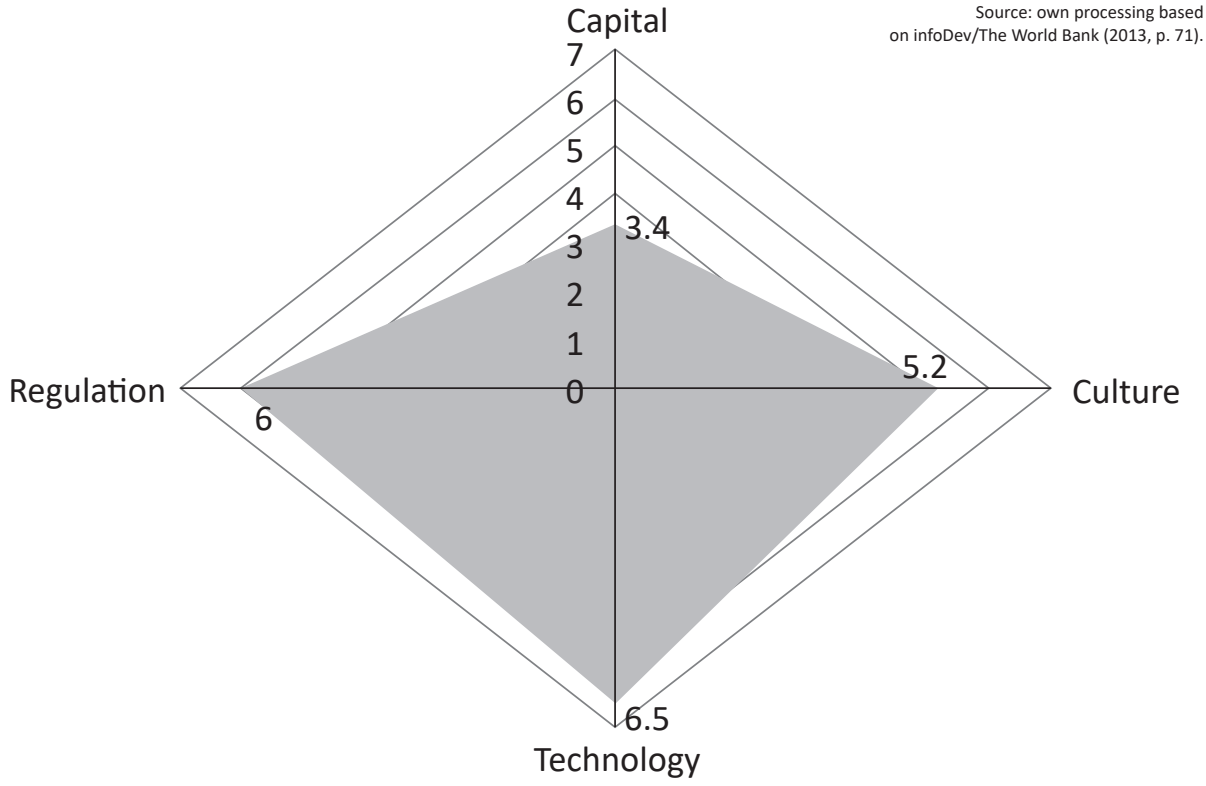
Source: compiled by the author based on UVCA (2017).

N	Question	Score	Explanation
1	Financing for start-up is mainly provided by (1 = governments/banks, 10 = friends and family)	0	Neither governments/banks nor friends and family provide financing for start-up
2	Financing for small businesses is mainly provided by (1 = governments/banks, 10 = friends and family)	1	It is not easy but possible to get some resources for small business
3	Banks are active in lending to small businesses and start-ups (1 = yes, 10 = no)	10	
4	Angel investors are actively making investments in early stage businesses in the country (1 = no, 10 = yes)	1	Angel investors are actively making investments in seed and pre-seed stage businesses
5	Early-stage venture capital funds are actively making investments in start-ups and small businesses in the country (1 = no, 10 = yes)	5	7 out of 18 responded venture funds are actively making investments in start-ups and small businesses in early stage businesses
	Total	17	

Ukraine got 17 points in assessing a country's readiness for crowdfunding by the availability of capital. It is 3.4 points of individual level of readiness for crowdfunding in this category of questions (17/5). It means that "Private capital markets exist but are not robust" (infoDev/The World Bank, 2013, p. 70). In such a case, experts recommend that governments should identify and solve problems connected with plenty of regulation, bureaucracy, costs (infoDev/The World Bank, 2013, p. 70).

Complete picture of Ukraine's readiness for crowdfunding is shown in Figure 2.

Summing up the abovementioned information, it is necessary to define the complete level of readiness for crowdfunding. If we divide the total number of points from the assessment 137 (39+57+24+17) into 26 questions, it will be 5.3. It means that there is a good possibility for crowdfunding in Ukraine. Experts advise to implement reward-based crowdfunding as a first stage (infoDev/The World Bank, 2013, p. 67).



Source: own processing based on infoDev/The World Bank (2013, p. 71).

Figure 2. Visualization of Ukraine's readiness for crowdfunding

CONCLUSION

Overall, this study highlights the need for financing losses from natural and man-made disasters by use of crowdfunding in the conditions of high level of uninsured catastrophic losses in the world. It was defined that more appropriate model of crowdfunding for such purpose is donation model with reward-based and donation-based business models. Stimulus for individuals to take part in crowdfunding for financing losses from natural and man-made disasters can vary depending on their location and business model. Ukraine's readiness for crowdfunding was examined. Complete level of readiness is 5.3. It means that reward-based crowdfunding is the first stage towards crowdfunding implementation and development. Further research should be done to investigate the mechanism of using a tax discount in case of implementation of reward-based crowdfunding for financing losses from natural and man-made disasters.

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